FINAL

September 2014

Shoreline Analysis Report for Shorelines in Walla Walla County and the Cities of Walla Walla, Prescott and Waitsburg

Prepared for:

Walla Walla County
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Walla Walla, WA 99362

The Watershed Company

BERK

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FINAL

WALLA WALLA COUNTY
GRANT NO. G1400495

SHORELINE ANALYSIS REPORT (TASK 5)

FOR SHORELINES IN WALLA WALLA COUNTY AND THE CITIES OF WALLA WALLA, PRESCOTT AND WAITSBURG

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EXECUTIVE SUMMARY

This Shoreline Analysis Report was prepared for Walla Walla County and the Cities of Walla Walla, Prescott and Waitsburg under a Washington State Department of Ecology (Ecology) grant to help create or update each jurisdiction's Shoreline Master Program (SMP). Washington's Shoreline Management Act of 1971 and its implementing State Guidelines adopted in 2003 require this update. The County has not updated its present SMP since it was first adopted in 1975. The Cities of Walla Walla and Waitsburg have separate SMPs which were adopted in 1977 and 1999, respectively. The City of Walla Walla last updated its SMP in 1986. The City of Prescott does not currently have an SMP.

Under State Guidelines, the County and Cities must base the master program provisions on an analysis of the most relevant and accurate scientific and technical information (WAC 173-26-201(3)(c)and(d)). This includes meeting the mandate of "no net loss" of shoreline ecological functions as well as providing mechanisms for restoration of impaired shoreline functions. The Inventory and Characterization Report is not a binding regulatory document but rather provides guidance for potential future updates to the SMP.

The County's SMP update is a multi-year process, which begins with an inventory and characterization of existing environmental and land use conditions, otherwise known as a "baseline condition." As part of developing a "baseline" condition, this Inventory and Characterization Report contains an inventory of a variety of elements, including land use, landscape processes, and ecological functions. These elements are spatially catalogued using a Geographic Information System (GIS), where possible, and are presented as a Countywide Map Folio. Together, these elements define what is understood to be the existing present day condition and helps inform the review of current shoreline regulations and highlight areas where changes may be necessary to meet shoreline management goals to provide for water dependent uses, public access and the protection of natural resources.

Key information provided in this report include: characterization of existing ecological functions through an analysis of both physical and biological processes; an analysis of existing land uses, shoreline modifications, public access, and areas under public ownership; preliminary identification of restoration opportunities; and recommendations for the SMP to help meet the Guidelines.

One waterbody not previously identified as a Shoreline of the State, Yellowhawk Creek, is included in this report. Available documentation indicates that the lower portion of Yellowhawk Creek from Cottonwood Creek to the confluence with the Walla Walla River meets the shoreline jurisdictional threshold and should be included as a Shoreline of the State. Another waterbody not previously identified as a Shoreline of the State, Whetstone Hollow Creek, was originally proposed to be included in jurisdiction based on a 2003 USGS study and was analyzed in earlier drafts of this report. However, additional investigation and analysis related to flow rates resulted in the decision to remove Whetstone Hollow Creek from shoreline jurisdiction and it is no longer analyzed herein.

Dry Creek, which was previously identified as a Shoreline of the State, was initially in jurisdiction and was analyzed in preliminary drafts of this report. However, additional investigation and analysis of flow rates resulted in the decision to remove Dry Creek from shoreline jurisdiction.

Appendix A includes documentation on the jurisdictional determinations for Whetstone Hollow Creek, Dry Creek and Yellowhawk Creek.

SHORELINE ANALYSIS REPORT

WALLA WALLA COUNTY AND THE CITIES OF WALLA WALLA, PRESCOTT AND WAITSBURG

1 INTRODUCTION

1.1 Background and Purpose

Walla Walla County (County) and the cities of Walla Walla, Prescott and Waitsburg obtained a grant from the Washington Department of Ecology (Ecology) in 2013 to complete a comprehensive update of each jurisdiction's Shoreline Master Program (SMP). One of the first steps of the update process is to inventory and characterize the County's shorelines as defined by the State's Shoreline Management Act (SMA) (RCW 90.58). This Shoreline Analysis Report was conducted in accordance with the Shoreline Master Program Guidelines (Guidelines, Chapter 173-26 WAC) and project Scope of Work promulgated by Ecology. Under these Guidelines, the County and Cities must identify and assemble the "most current, accurate, and complete scientific and technical information available that is applicable to the issues of concern" regarding natural and built environment characteristics in shoreline jurisdiction.

This Shoreline Analysis Report inventories and describes existing conditions and characterizes ecological functions in the shoreline jurisdiction of all unincorporated areas within the County, as well as the cities of Walla Walla, Prescott and Waitsburg. This assessment of current conditions will serve as the baseline against which the impacts of future development actions in shoreline jurisdiction will be measured. The Guidelines require that the County and Cities demonstrate that the implementation of their updated SMP yields "no net loss" in shoreline ecological functions relative to the baseline (current condition). By describing and inventorying existing conditions, this Shoreline Analysis Report will be used to help inform the development of appropriate SMP policies, regulations, and environment designations to help meet the "no net loss" goal.

1.2 Shoreline Jurisdiction

As defined by the Shoreline Management Act of 1971, shorelines include certain waters of the state plus their associated "shorelands." At a minimum, the waterbodies

designated as shorelines of the state are streams whose mean annual flow is 20 cubic feet per second (cfs) or greater, lakes whose area is greater than 20 acres, and all marine waters. Shorelands are defined as:

> "those lands extending landward for 200 feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward 200 feet from such floodways; and all wetlands and river deltas associated with the streams, lakes, and tidal waters which are subject to the provisions of this chapter…Any county or city may determine that portion of a one-hundred-year-floodplain to be included in its master program as long as such portion includes, as a minimum, the floodway and the adjacent land extending landward two hundred feet therefrom… Any city or county may also include in its master program land necessary for buffers for critical areas (RCW 90.58.030)"

The ordinary high water mark (OHWM) 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: PROVIDED, That in any area where the ordinary high water mark cannot be found, the ordinary high water mark adjoining salt water shall be the line of mean higher high tide and the ordinary high water mark adjoining fresh water shall be the line of mean high water" (RCW 90.58.030(2)(b)).

Ecology has identified the upstream limits of shoreline streams and rivers based on projected mean annual flow of 20 cubic feet per second (cfs) (Higgins 2003), and those lakes that are 20 acres or greater in size. The Columbia River, Snake River, Touchet River, Walla Walla River, Mill Creek and Yellowhawk Creek all qualify as Shorelines of the State based on this definition. Stream and river shoreline jurisdiction also includes several adjacent waterbodies along the Snake and Columbia Rivers, including Ayer Boat Basin, Curlew Pond, Casey Pond, Smith Harbor, Quarry Pond, J Line Pond, and Burbank Slough. A Shoreline Jurisdiction Summary determination is included as Appendix A.

All streams and rivers that have mean annual flow of 200 cfs or greater or portions of waterbodies downstream from the first 300 square miles of a drainage area are

considered Shorelines of Statewide Significance in Eastern Washington. This special status applies to all of the Columbia, Snake, and Walla Walla Rivers within the County and a portion of the Touchet River upstream until approximately 2 miles west of the County's border with Columbia County and all of their associated shoreline jurisdictional area in the County. For Shorelines of Statewide Significance, the SMA sets specific preferences for uses and calls for a higher level of effort in implementing its objectives. A detailed discussion of the entire jurisdiction assessment and determination process can be reviewed in full in Appendix A.

Bennington Lake qualifies as a Shoreline of the State (larger than 20 acres). The County does not have any lakes that qualify as Shorelines of Statewide Significance (greater than 1,000 acres).

1.3 Study Area

Walla Walla County encompasses approximately 1,299 square miles and is located in the southeast part of Washington along the Oregon-Washington border. It is bounded by the Columbia and Snake Rivers to the west and north and by Columbia County to the east. The County includes portions of two Water Resource Inventory Areas (WRIAs), including the majority of the Walla Walla Watershed (WRIA 32) and the south-eastern portion of the Lower Snake Watershed (WRIA 33).

The County is predominantly rural and agricultural in nature, with unincorporated areas making up most of the county territory. There are unincorporated communities such as Burbank and Touchet which include housing, commercial and industrial activities. Incorporated cities include Walla Walla, Prescott, College Place and Waitsburg. Each City has a designated Urban Growth Area (UGA) in which the County retains governance until the area is annexed. The County coordinates planning in the UGAs with each City.

The study area for this report includes all land currently within proposed shoreline jurisdiction for unincorporated Walla Walla County and the cities of Walla Walla, Prescott and Waitsburg. The study area includes relevant discussion of the contributing watersheds.

In total, this shoreline inventory has mapped approximately 225 miles of river shoreline that meet shoreline jurisdiction criteria. Jurisdictional shoreland area totals 18.9 square miles, which includes floodways, and associated floodplains and wetlands. Federal lands make up approximately 16 percent of that area, or three square miles total.

2 SUMMARY OF CURRENT REGULATORY FRAMEWORK

2.1 Shoreline Management Act

The Shoreline Management Act of 1971 promoted planning along shorelines and coordination among governments. The legislative findings and policy intent of the SMA states:

> "There is, therefore, a clear and urgent demand for a planned, rational, and concerted effort, jointly performed by federal, state, and local governments, to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines (RCW 90.58.020)."

While protecting shoreline resources by regulating development, the SMA is also intended to provide balance by encouraging water-dependent or water-oriented uses while also conserving or enhancing shoreline ecological functions and values. SMPs are the local land use policies and regulations designed to manage shoreline use. SMPs must be based on state guidelines, but should be tailored to the specific conditions and needs of the local community.

Walla Walla County adopted its present Shoreline Management Master Plan in 1975, and it has not been updated since that time. The Cities of Walla Walla and Waitsburg have separate SMPs which were adopted in 1977 and 1999, respectively. The City of Walla Walla last updated its Shoreline Master Program in 1986. The City of Prescott does not have an SMP. The information provided in this report may be used to create new or updated SMPs for each local jurisdiction.

2.2 Local Regulations

2.2.1 Walla Walla County

Walla Walla County adopted its first Shoreline Master Program in 1975, and it has not been updated since. Shoreline uses, developments, and activities are also subject to the County's Comprehensive Plan, County Code, and various other provisions of County, state and federal laws.

The current SMP designations for Walla Walla County are briefly described below.

- **Urban**: The Urban environment is an area of high intensity land-use including residential, commercial, recreational and industrial development. It is particularly suitable to those areas presently subjected to extremely intensive use pressure, as well as areas planned to accommodate urban expansion.
- **Rural**: The Rural environment is intended for those areas characterized by intensive agriculture and recreational uses and those areas having a high capability to support active agricultural practices and intensive outdoor recreational development.
- **Conservancy**: The Conservancy environment is intended for very low intensity land uses and larger acreages with relatively low land values.
- **Natural**: The Natural environment is characterized by the presence of some unique natural or cultural features considered valuable in their natural or original condition which are relatively intolerant of intensive human use.

The County Comprehensive Plan, last updated in 2009, is a statement of policies and goals that guides growth and development throughout the County. Each of the basic elements required by the Growth Management Act (GMA) are addressed in the County Comprehensive Plan, including land use, rural, housing, transportation, utilities, capital facilities, economics, and parks and recreation.

County regulations applicable to critical areas are detailed in Walla Walla County Code (WWCC) Chapter 18.08. These regulations were adopted in 1995, and subsequently revised in 2008. In those regulations the County specifies reach-specific minimum buffer widths of 35 to 100 feet (WWCC 18.08.650) on waterways in fish and wildlife habitat conservation areas. The regulations also require wetland buffers between 25 and 250 feet based on wetland classification (per the Washington State Wetland Rating System for Eastern Washington, as amended) and intensity of proposed land use (WWCC 18.08.340). The County's Critical Areas regulations also apply to geologically hazardous areas, critical aquifer recharge areas, and frequently flooded areas.

Many shoreline and wetland areas within the County contain functioning buffers of the required widths. Smaller functioning buffers are found where developments existed prior to the critical areas regulations or where buffers of different widths were previously established in approved site plans or protected critical area easements.

Shoreline uses, developments, and activities regulated under the critical areas regulations are also subject to the County's Comprehensive Plan, Walla Walla County Code, and various other provisions of County, state and federal laws. Any applicant must comply with all applicable laws prior to commencing any use, development, or

activity. The County will ensure consistency between the SMP and other County codes, plans and programs by reviewing each for consistency during periodic updates of the County's Comprehensive Plan.

2.2.2 City of Walla Walla

The City of Walla Walla adopted its own SMP in 1977, which was amended in 1981 and 1986. It has not been updated since that time. The SMP has the same four environmental designations as Walla Walla County's SMP, described above. It has also adopted critical areas regulations, contained in WWMC Chapter 21.04, to implement the goals, policies, guidelines, and requirements of the Growth Management Act and the City of Walla Walla Urban Area Comprehensive Plan. These regulations have a recommended 35-foot minimum streamside buffer width for waterways within the City, except for Yellowhawk Creek from Russell to Mill Creeks, which has a minimum 50-foot buffer (WWMC 21.04.650). Wetland buffers between 25 and 250 feet are required based on wetland classification (per the Washington State Wetland Rating System for Eastern Washington, as amended) and intensity of proposed land use (WWMC 21.04.340).

2.2.3 City of Waitsburg

The City of Waitsburg adopted a SMP in 1999. It has not been updated since that time. The SMP has the same four environmental designations as Walla Walla County and the City of Walla Walla's SMPs described above. The City of Waitsburg Comprehensive Plan was adopted in 1998 and revised in 2006/2007. The City also adopted critical areas regulations, first in 1996, and amended in 2008 (contained in Chapter 10.2A of the Waitsburg Municipal Code), to implement the goals, policies, guidelines, and requirements of the Growth Management Act and the City of Waitsburg Comprehensive Plan. These regulations require a 25-foot buffer on the Touchet River and a 15-foot buffer on Coppei Creek. The regulations also establish a 15-foot buffer from the top and bottom of steep slopes exceeding 15 percent slope. WMC 10.2A.030 describes the City's approach to regulating critical areas as follows,

> "This Chapter addresses only those activities within the buffer zones on the Touchet River and the Coppei Creek, and geologically hazardous areas. The National Wetlands Inventory Maps show that all wetlands within the City and adopted Urban Growth Areas are directly associated with the Touchet River and the Coppei Creek. These buffers along the Touchet and the Coppei also contain all of the wildlife habitat within the current City limits and adopted Urban Growth Area."

2.2.4 City of Prescott

The City of Prescott does not currently have a SMP and therefore no shoreline permits have been issued in the past. Information regarding City of Prescott existing plans and regulations, including critical areas, were not able to be located.

2.3 State Regulations

Aside from the Shoreline Management Act, State regulations most pertinent to development in the County and Cities' shorelines include the State Hydraulic Code, Growth Management Act, State Environmental Policy Act, Watershed Planning Act, Water Resources Act, Salmon Recovery Act, and case law. A variety of agencies (e.g., Washington Department of Ecology, Washington Department of Fish and Wildlife, Washington Department of Natural Resources) are involved in implementing these regulations or otherwise manage public shoreline areas. The Department of Ecology reviews all shoreline projects that require a shoreline permit, but has specific regulatory authority over shoreline conditional use permits and shoreline variances. Other agency reviews of shoreline developments are typically triggered by in- or over-water work, discharges of fill or pollutants into the water, or substantial land clearing.

Depending on the nature of the proposed development, state regulations can play an important role in the design and implementation of a shoreline project, ensuring that impacts to shoreline functions and values are avoided, minimized, and/or mitigated. During the comprehensive SMP update, the County and Cities will consider other state regulations to ensure consistency as appropriate and feasible with the goal of streamlining the shoreline permitting process. A summary of some of the key state regulations and/or state agency responsibilities follows.

Hydraulic Code: Chapter 77.55 RCW (the Hydraulic Code) gives the Washington Department of Fish and Wildlife (WDFW) the authority to review, condition, and approve or deny "any construction activity that will use, divert, obstruct, or change the bed or flow of State waters." These activities may include stream alteration, culvert installation or replacement, pier and bulkhead repair or construction, among others. In a permit called a Hydraulic Project Approval (HPA), WDFW can condition projects to avoid, minimize, restore, and compensate adverse impacts.

Section 401 Water Quality Certification: Section 401 of the federal Clean Water Act allows states to review, condition, and approve or deny certain federal permitted actions that result in discharges from fills or excavations to State waters, including wetlands and streams. In Washington, the Department of Ecology is the State agency that has been

delegated responsibility for conducting that review, with their primary review criteria of ensuring that State water quality standards are met. Actions within streams or wetlands within the shoreline zone that require a Section 404 permit (see below), Coast Guard Permit, or a Federal Energy Regulatory Commission (FERC) license require a Section 401 water quality certification.

Washington Department of Natural Resources: Washington Department of Natural Resources (WDNR) is charged with protecting and managing use of state-owned aquatic lands. WDNR manages more than 5.6 million acres of state-owned forest, range, commercial, agricultural, conservation, and aquatic lands. WDNR manages these lands for revenue, outdoor recreation, and habitat for native fish and wildlife. Water-dependent uses waterward of the OHWM require review by WDNR to establish whether the project is on state-owned aquatic lands. WDNR recommends that all proponents of a project waterward of the OHWM make contact with WDNR to determine jurisdiction and requirements.

Watershed Planning Act: The Watershed Planning Act of 1998 (Chapter 90.82 RCW) was passed to encourage local planning of local water resources, recognizing that there are citizens and entities in each watershed that "have the greatest knowledge of both the resources and the aspirations of those who live and work in the watershed; and who have the greatest stake in the proper, long-term management of the resources." Walla Walla County is within two watershed basins. The Walla Walla Watershed Plan (WRIA 32) was completed in 2005, and the Watershed Planning Group has completed several projects under the Watershed Planning Act to date. The Plan recommended changes to Ecology's instream flow rule, and in 2007, Ecology amended the rule to achieve the following:

- Establish instream flow water rights,
- Modify the seasonal closures of surface waters,
- Close withdrawals from shallow gravel aquifers, control and manage future permit-exempt ground water withdrawals from the gravel aquifer, in populated areas,
- Limit stock watering based on legal lot sizes, and
- Limit future withdrawals during high flow periods to projects resulting in net environmental benefits.

Additionally, to address the unique water challenges found in the Walla Walla watershed, local interests are working with Ecology to jointly develop the concept of the

Walla Walla Water Management Initiative. The Lower Snake Watershed (WRIA 33) is not presently subject to the Watershed Planning Act.

Water Pollution Control Act: Chapter 90.48 RCW establishes the State's policy "to maintain the highest possible standards to insure the purity of all waters of the State consistent with public health and public enjoyment thereof, the propagation and protection of wild life, birds, game, fish and other aquatic life, and the industrial development of the State, and to that end require the use of all known available and reasonable methods by industries and others to prevent and control the pollution of the waters of the State of Washington." The Department of Ecology is the agency charged with crafting and implementing rules and regulations in accordance with this legislation.

2.4 Federal Regulations

Federal regulations most pertinent to development in the County's and Cities' shorelines include the Endangered Species Act, the Clean Water Act, and the Rivers and Harbors Appropriation Act. Other relevant federal laws include the National Environmental Policy Act, Anadromous Fish Conservation Act, Clean Air Act, and the Migratory Bird Treaty Act. A variety of agencies (e.g., U.S. Army Corps of Engineers [Corps], National Marine Fisheries Service, U.S. Fish and Wildlife Service) are involved in implementing these regulations, but review by these agencies of shoreline development in most cases would be triggered by in- or over-water work, or discharges of fill or pollutants into the water. Depending on the nature of the proposed development, federal regulations can play an important role in the design and implementation of a shoreline project, ensuring that impacts to shoreline functions and values are avoided, minimized, and/or mitigated. During the SMP update, the County and Cities will consider other federal regulations to ensure consistency as appropriate and feasible with the goal of streamlining the shoreline permitting process. A summary of some of the key federal regulations and/or federal agency responsibilities follows.

Clean Water Act: Major components of the Clean Water Act include Section 404, Section 401, and the National Pollutant Discharge Elimination System (NPDES).

Section 404 provides the Corps, under the oversight of the U.S. Environmental Protection Agency, with authority to regulate "discharge of dredged or fill material into waters of the United States, including wetlands" (http://www.epa.gov/owow/wetlands/pdf/ reg_authority_pr.pdf). The extent of the Corps' authority and the definition of fill have been the subject of considerable legal

activity. As applicable to the County's shoreline jurisdiction, however, it generally means that the Corps must review and approve most activities in streams and wetlands. These activities may include wetland fills, stream and wetland restoration, and culvert installation or replacement, among others. The Corps requires projects to avoid, minimize, and compensate for impacts.

A Section 401 Water Quality Certification is required for any applicant for a federal permit for any activity that may result in any discharge to waters of the United States. States and tribes may deny, certify, or condition permits or licenses based on the proposed project's compliance with water quality standards. In Washington State, the Department of Ecology has been delegated the responsibility by the U.S. Environmental Protection Agency for managing implementation of this program.

The NPDES is similar to Section 401, and it applies to ongoing point-source discharge. The County is engaged in compliance with the NPDES Phase II Municipal Stormwater General Permit requirements that address stormwater system discharges to surface waters. Permits include limits on what can be discharged, monitoring and reporting requirements, and other provisions designed to protect water quality.

Endangered Species Act (ESA): Section 9 of the ESA prohibits "take" of listed species. Take has been defined in Section 3 as: "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The take prohibitions of the ESA apply to everyone, so any action that results in a take of listed fish or wildlife would be a violation of the ESA and is strictly prohibited. Per Section 7 of the ESA, activities with potential to affect federally listed or proposed species and that either require federal approval, receive federal funding, or occur on federal land must be reviewed by the National Marine Fisheries Service (NOAA Fisheries) and/or U.S. Fish and Wildlife Service (USFWS) via a process called "consultation." Activities requiring a Section 10 or Section 404 permit also require such consultation if these activities occur in waterbodies with listed species. Section 4(f) of the ESA directs the Services to develop or appoint teams to develop and implement recovery plans for threatened and endangered species. Walla Walla County is a member of the Snake River Salmon Recovery Board and County staff contributed to the development of the 2011 Snake River Salmon Recovery Plan for Southeast WA.

Magnuson-Stevens Fishery Conservation and Management Act: The Magnuson-Stevens Fishery Conservation and Management Act of 1996 is administered by the National Marine Fisheries Service to foster and protect commercial and recreational fisheries of designated species that "contribute to the food supply, economy, and health

of the Nation and provide recreational opportunities" (18 U.S.C. §1801-a). In the lower Snake and upper Columbia Rivers designated species include Chinook and coho salmon. The primary avenue for on-the-ground management of those species is designation and protection of "essential fish habitat" (EFH), which is "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The National Marine Fisheries Service incorporates consideration of EFH into the same process under which projects are reviewed per the Endangered Species Act.

Rivers and Harbors Act: Section 10 of the federal Rivers and Harbors Appropriation Act of 1899 provides the U.S. Army Corps of Engineers (Corps) with authority to regulate activities that may affect navigation of "navigable" waters. Designated "navigable" waters in Walla Walla County include the Columbia, Snake, and Walla Walla Rivers. Proposals to construct new or modify existing over-water structures (including bridges), to excavate or fill, or to "alter or modify the course, location, condition, or capacity of navigable waters must be reviewed and approved by the Corps.

McNary Shoreline Management Plan: The majority of the Lake Wallula shoreline, located above McNary Dam, is owned and managed by the Corps. In 2012, the Corps updated the 1983 McNary Shoreline Management Plan for management and permitting of private use on Lake Wallula and Corps-managed lands with frontage on Lake Wallula (US Army Corps of Engineers 2012). Most of Walla Walla County's unincorporated shoreline area governed by the McNary Shoreline Management Plan is designated by the Corps as "Protected Lakeshore," or "Prohibited Access." A couple of locations are designated as "Public Recreation," and one area, near Burbank is designated "Limited Development." The updated McNary Shoreline Management Plan provides criteria for design and construction of existing private docks (including "special status" docks, or "grandfathered" docks), new community and private docks, and vegetation modification. The plan does not apply to public docks. The plan allows for a total of 100 private docks on Lake Wallula, including existing docks, assigning priority to new community docks that jointly serve multiple users. As of January 2012, only 27 new, private docks can be permitted in areas designated under the McNary Shoreline Management Plan for "Limited Development". In Walla Walla County one such Limited Development area is designated along a small portion of the Lake Wallula shoreline in Burbank.

Pacific Northwest Electric Power Planning and Conservation Act: Congress established the Northwest Power Act in 1980, which established the Northwest Power and Conservation Council with the goals of preparing and adopting (1) a regional

conservation and electric power plan and (2) a program to protect, mitigate, and enhance fish and wildlife. As a member of the Walla Walla Watershed Planning Unit, Walla Walla County contributed to the preparation of the Walla Walla Subbasin Plan in 2004, prepared for the Northwest Power and Conservation Council. The Subbasin Plan describes to the Council the most effective ways that the Council and the Bonneville Power Administration (BPA) can meet their obligations in the Walla Walla Subbasin to mitigate the impacts on fish and wildlife resources from the construction and operation of the Federal Columbia River Power System (FCRPS).

3 SUMMARY OF ECOSYSTEM CONDITIONS

The majority of Walla Walla County is located within Water Resource Inventory Area (WRIA) 33, the Walla Walla watershed. The northern/western portions of the county near the Snake River are within WRIA 33, the Lower Snake watershed (Figure 3-1). Each of these subbasins, as well as the Columbia River system found in the southwest corner of the county, are described in the following sections.

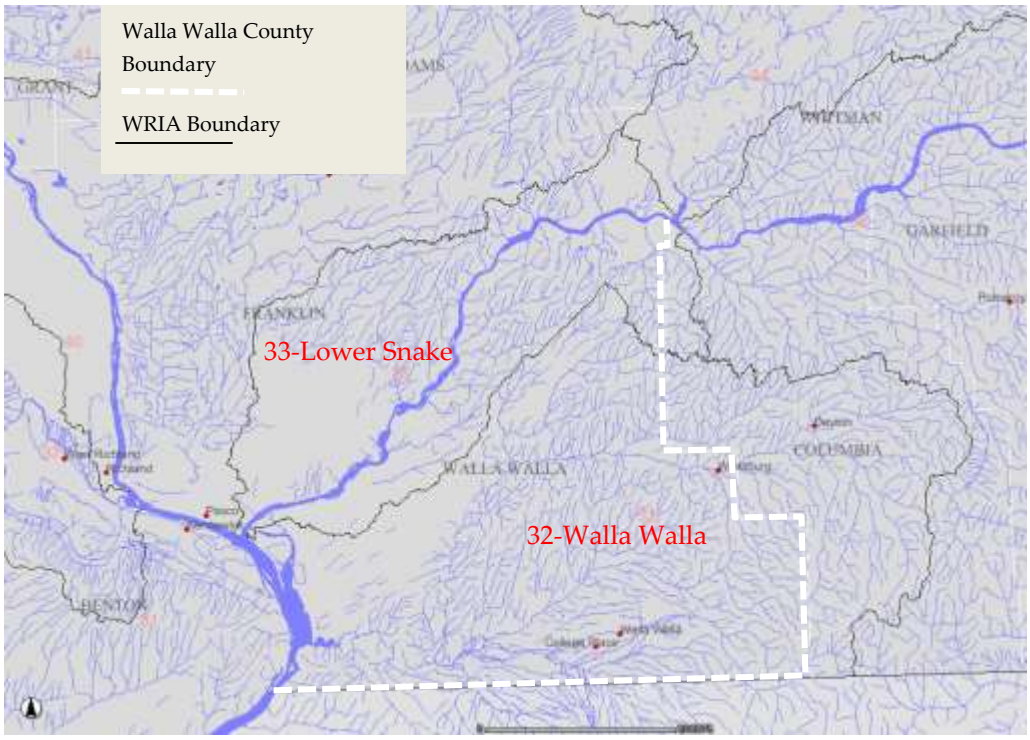


Exhibit 3-1. Map of Water Resource Inventory Areas in Walla Walla County (Source: WDFW, Salmonscape)

3.1 Geology

The Columbia River was formed by the forces of glaciation, volcanism, hydrology, and erosion and accretion of sediments. The Cascade mountain range was formed 50 to 35 million years ago, at which time uplift of the Rocky Mountains combined with subduction of the oceanic plates of the Pacific Ocean, creating the flow path for the River. Subsequent glaciation restructured and expanded the extent of the Columbia River basin. Near the end of the last glacial period, the Missoula Floods shaped the physical landscape, transporting and depositing silt, sand, and gravel that now form much of the landscape in the Columbia River basin (Simenstad et al. 2011).

3.1.1 Walla Walla WRIA (32)

The Walla Walla Basin is a structural basin bounded by basalt cored structural uplifts. These uplifts include the Blue Mountains on the east, the Horse Heaven Hills on the south, the Palouse Slope on the north, and the Divide Anticline on the west. The same Columbia River basalt units found on these highlands (Swanson et al. 1981, Schuster 1994) occur beneath the Basin where they are covered by sedimentary strata, which can be many of hundreds of feet thick. These sedimentary strata, the suprabasalt sediments, record a history of basin subsidence and uplift of the surrounding highlands, river and flood plain deposition, and soil formation and wind deposition (Newcomb 1965, Fecht et al. 1987, Lindsey 1996, Lindsey and Tolan 2004). The suprabasalt sediments overlie an irregular basalt surface which is the product of basin subsidence, highland uplift along faults and folds bounding the Basin, and emplacement of Columbia River basalt flows, some of which only partially covered the Basin (Lindsey and Tolan 2007).

The Walla Walla Basin contains a thick (up to 800 feet) sequence of clastic sediments overlying basalt. These strata, referred to herein as the suprabasalt sediments, host an alluvial aquifer system which supplies water to hundreds of domestic and irrigation wells. In addition, this alluvial aquifer system displays a high degree of hydrologic continuity with salmonid-bearing surface waters (Lindsey and Tolan 2007).

The Walla Walla basin has a subsurface distribution of five suprabasalt sediment stratigraphic units and the underlying Columbia River basalt. Suprabasalt sediments found within the Walla Walla Basin consist of continental clastic strata deposited during the Quaternary, before, during, and after Pleistocene Cataclysmic Flooding, and continental clastic strata deposited in the Mio-Pliocene during the waning stages of, and following the end of, Columbia River basalt volcanism. The Quaternary deposits are subdivided into two units, the Quaternary fine unit (silt and fine sand) and the Quaternary coarse unit (uncemented basalt lithic sand and gravel). Of these two units, the fine unit is more widespread and generally consists of Touchet Beds, loess, and fine grained alluvial flood plain deposits. Without good surface geologic mapping, these materials generally are indistinguishable in the subsurface (Lindsey and Tolan 2007).

The Mio-Pliocene strata (which generally correspond to what R.C. Newcomb originally referred to as the old clay and gravel, of Pleistocene age) are subdivided into three units: (1) Mio-Pliocene upper coarse unit, (2) Mio-Pliocene fine unit, and (3) Mio-Pliocene basal coarse unit. The upper coarse unit consists predominantly of indurated, weathered, basalt lithic sand and gravel that commonly is red to brown in color. Silt, both as intercalated beds and as matrix, can be locally abundant. The fine unit consists

predominantly of weakly indurated siltstone and claystone with minor intercalated sand and gravel. Previously unrecognized felsic-micaceous quartz sand interbedded with micaceous siltstone and claystone forms the basalt coarse unit. The basal unit directly overlies basalt at several locations in the Basin (Lindsey and Tolan 2007).

The basalt surface that underlies these sediments forms the bottom of the alluvial aquifer system. Mapping this surface reveals a number of discontinuities that seem to project upward into the overlying suprabasalt sediments. Many of these features are interpreted to be faults and folds. In addition to these folds and faults, the basalt surface underlying the basin is found to not be defined by the same basalt unit at all locations. At minimum three different basalt units are present, including one Saddle Mountains Basalt unit, forming the uppermost basalt unit at different locations in the Basin (Lindsey and Tolan 2007).

3.1.2 Lower Snake WRIA (33)

The Snake River was formed by the forces of glaciation, volcanism, hydrology and erosion and accretion of sediments. Erosion-resistant basalt flows has limited the flow path of the Snake River, resulting in steep-walled canyons along much of its path. Much of the basalt is from the Columbia River Basalt Group. Collectively the Columbia River Basalt Group (CRBG) consists of a thick sequence of more than 300 continental tholeiitic flood basalt flows that cover an area of more than 200,000 km^2 in Washington, Oregon, and western Idaho (Camp et al. 2003). The total estimated CRBG volume is greater than 234,000 km^3 (Camp et al. 2003) with the maximum thickness of over 3.2 km occurring in the Pasco Basin area based on geophysical and deep hydrocarbon exploration well data (Reidel et al. 1989a, 1989b). The CRBG underlies the entire area and is estimated to range from 1 to greater than 1.5 km-thick. CRBG flows were erupted during a period from about 17 to 6 Ma from long (10 to >50 km), north-northwest-trending linear fissure systems located in eastern Washington, northeastern Oregon, and western Idaho. Although CRBG eruptive activity spanned an 11 million year period, most (>96 volume %) of the CRBG flows were emplaced over a 2.5 million year period from 17 to 14.5 Ma (Swanson and others, 1979; Tolan and others, 1989). When erupted, CRBG basalt flows generally flowed from east to west across a generally flat to gently rolling topography, with each successive basalt flow commonly burying much of the preexisting topography. Prior to 14.5 Ma this topographic surface was generally covered by poorly integrated stream drainages and interconnected lakes. Following 14.5 Ma stream drainages were generally well established with discreet river channels and canyons forming. The CRBG has been divided into a host of regionally mappable units based on variations in physical, chemical, and paleomagnetic properties - in regard to

stratigraphic position - that exist between flows and packets of flows (Swanson et al. 1981, Beeson et al. 1985, Reidel et al. 1989b). The CRBG underlying the Basin is divided into three formations. These formations are, from youngest to oldest, the Saddle Mountains Basalt, Wanapum Basalt, and Grande Ronde Basalt (Swanson et al. 1981). These formations are further subdivided into members defined, as are the formations, on the basis of a combination of unique physical, geochemical, and paleomagnetic characteristics. These members can be, and often are, further subdivided into flow units (e.g., Beeson et al. 1985, Lindsey and Tolan 2007).

3.2 Geography, Topography, and Drainage Patterns

3.2.1 Walla Walla WRIA (32)

The Walla Walla River originates in the Blue Mountains in Oregon at an elevation of approximately 6,250 feet. Major tributaries to the Walla Walla River within Walla Walla County include the Touchet River and Mill Creek, including Yellowhawk Creek, which is a distributary braid of Mill Creek. The Touchet River drains the northern portion of the Walla Walla watershed. Mill Creek drains the majority of the southern portion of the watershed within Walla Walla County.

Precipitation is concentrated in the winter months, and varies depending on location in the watershed. Most flooding results from rain-on-snow events in the late winter and early spring. Many of the streams that are not fed by snowmelt dry up in the summer months.

Groundwater in the Walla Walla Basin occurs in two principal aquifer systems: (1) the unconfined to confined suprabasalt sediment (alluvial) aquifer system and (2) the underlying confined basalt aquifer system (Snake River Salmon Recovery Board 2011). The basalt aquifer system is regional in character, having limited hydraulic connection to the Walla Walla River except in the canyons of the Blue Mountains. In contrast, the alluvial aquifer system, with sediments up to 800 feet thick, has a high degree of hydraulic connection with streams on the valley floor. In recent decades the management and development of surface water resources has led to installation of flow control devices at the head of distributary channels. Over time, the management of the distributary network has become less natural. High flows during the winter and spring no longer have free access to the distributary network. This, along with the development of groundwater resources and the channelization of the valley's rivers and creeks, has created a declining alluvial aquifer condition. Generally, the 'spreading out' of water across the alluvial fans via distributary channels, coupled with the high hydraulic conductivity of the underlying coarse sediment, function as a primary

groundwater recharge mechanism for the entire alluvial aquifer. This seasonally recharged aquifer system in-turn feeds the valley's springs, spring creeks and larger streams. This cycling of surface water to groundwater recharge, followed by later discharge in springs and as stream base flow creates a delay in discharge of these waters from the valley. Depending on local conditions, this delay can range from days to months, and even years (Jiménez 2012). The declining alluvial aquifer, coupled with high connectivity between surface water and groundwater, has created stream reaches where high seepage loss occurs and significant volumes of surface water drain to the aquifer. In recent years, the listing of steelhead and bull trout as threatened under the Endangered Species Act and the reintroduction of spring chinook salmon within the watershed, have led to out-of-court agreements between irrigators and Federal fishery agencies. As a result of these agreements, local irrigators are leaving a portion of their legal water rights instream as bypass water year round (Walla Walla Basin Watershed Council 2013).

3.2.2 Lower Snake WRIA (33)

The Snake River originates in western Wyoming, passing through Idaho, and into southeastern Washington. The Lower Snake River watershed extends from the confluence of the Palouse and Snake rivers to the mouth of the Snake River at the Columbia River. There are no major tributaries in the Lower Snake River Watershed.

The Snake River contributes about 20 percent of the Columbia River flow (Snake River Salmon Recovery Board 2011). Streamflows are controlled by the hydropower system, as well as seasonally variable flows in smaller tributaries corresponding with winter precipitation and spring snowmelt.

The Snake River receives inflow from groundwater aquifers along its reach, including upper aquifers and deeper basalt aquifers. The minor streams and rivers originating in the Blue Mountains typically flow year-round, but may lose water to groundwater in some reaches and gain water from seeps and springs in other reaches (Snake River Salmon Recovery Board 2011).

3.2.3 Columbia River

The Columbia River is the largest river in the Pacific Northwest, and the fourth largest river in the United States by volume. The Columbia River watershed originates in Canada, and the drainage area of over 258,000 square miles includes areas of Washington, Oregon, Montana, and Idaho, Wyoming, and Nevada.

The hydrology of the Columbia River Basin reflects the interaction of topography geology, and climate. Most of the drainage of the Columbia River falls as snow in the Rocky Mountains and in the Cascade Range. Annual peak discharges occur in the spring (April to June) and generally results from snowmelt in the interior subbasin. Historically, flood flows peaked at 1.2 million cfs (Simenstad et al. 2011). Today, as a result of dam regulation, the highest flows occur from April to June, with discharge at the mouth of the river ranging from 100,000 to 500,000 cfs (Neal 1972, Marriott 2002).

3.3 Key Species and Habitats

Habitat within shoreline jurisdiction ranges from diverse and complex riparian and wetland habitat along the Columbia River including sloughs, ponds and islands, to narrow bands of upland shrub-steppe vegetation through primarily agricultural fields in the upper watersheds.

The County's shorelands support significant populations of small mammals, which are highly responsive to changes in vegetation cover and play important roles in ecosystem functions, including water infiltration, habitat formation, and prey source for predators. Large and medium-size mammals potentially using areas within shoreline jurisdiction are black bear, black-tailed deer, Northwest white-tailed deer and mule deer. Rocky Mountain elk are potentially present in the mountainous upper watershed in the southeast portion of the county.

The McNary National Wildlife Refuge (see Section 3.4.2) along the east bank of the Columbia River from the confluence of the Snake River to the mouth of the Walla Walla River is important habitat for migratory waterfowl, shorebirds and songbirds.

Table 3-1 below, lists the priority habitats and species (PHS) WDFW has identified in Walla Walla County. A brief discussion specific to each watershed follows. Fish and Wildlife PHS maps are included as Maps 17-19 in the map folio (Appendix B).

Table 3-1. Priority Habitats and Species in Walla Walla County

(Source: WDFW 2008)

Priority Habitat/Species	State Status	Federal Status
Habitats		
Aspen Stands	--	--
Biodiversity Areas & Corridors	--	--
Inland Dunes	--	--
Juniper Savannah	--	--
Eastside Steppe	--	--
Shrub-Steppe	--	--

Priority Habitat/Species	State Status	Federal Status
Riparian	--	--
Freshwater Wetlands & Freshwater Deepwater	--	--
Instream	--	--
Caves	--	--
Cliffs	--	--
Snags and Logs	--	--
Talus	--	--
Fish		
Pacific Lamprey	--	Species of Concern
White Sturgeon	--	--
Leopard Dace	Candidate	--
Umatilla Dace	Candidate	--
Mountain Sucker	Candidate	--
Bull Trout/Dolly Varden	Candidate*	Threatened*
Chinook Salmon	Candidate	Threatened (Upper Columbia Spring run is Endangered)
Coho	--	Threatened in Lower Columbia
Kokanee	--	--
Rainbow Trout/Steelhead/Inland Redband Trout	Candidate**	Threatened**
Sockeye Salmon	Candidate	Endangered in Snake River
Westslope Cutthroat	--	--
Margined Sculpin	Sensitive	Species of Concern
Wildlife		
Columbia Spotted Frog	Candidate	--
Rocky Mountain Tailed Frog	Candidate	Species of Concern
Western Toad	Candidate	Species of Concern
Striped Whipsnake	Candidate	--
Sagebrush Lizard	Candidate	Species of Concern
American White Pelican	Endangered	--
Western Grebe	Candidate	--
E WA breeding concentrations of: Grebes, Cormorants	--	--
E WA breeding: Terns	--	--
Black-crowned Night-heron	--	--
Great Blue Heron	--	--
Cavity-nesting ducks: Wood Duck, Barrow's Goldeneye, Common Goldeneye, Bufflehead, Hooded Merganser	--	--
Tundra Swan	--	--
Waterfowl Concentrations	--	--
Bald Eagle	Sensitive	Species of Concern
Ferruginous Hawk	Threatened	Species of Concern
Golden Eagle	Candidate	--

Priority Habitat/Species	State Status	Federal Status
Northern Goshawk	Candidate	Species of Concern
Peregrine Falcon	Sensitive	Species of Concern
Prairie Falcon	--	--
Dusky Grouse	--	--
Mountain Quail	--	--
Ring-necked Pheasant	--	--
Wild Turkey	--	--
Upland Sandpiper	Endangered	--
E WA breeding occurrences of: Phalaropes, Stilts and Avocets	--	--
Burrowing Owl	Candidate	Species of Concern
Flammulated Owl	Candidate	--
Vaux's Swift	Candidate	--
Black-backed Woodpecker	Candidate	--
Lewis' Woodpecker	Candidate	--
Pileated Woodpecker	Candidate	--
Loggerhead Shrike	Candidate	--
Sage Thrasher	Candidate	--
Merriam's Shrew	Candidate	--
Preble's Shrew	Candidate	Species of Concern
Roosting Concentrations of: Big-brown Bat, Myotis bats, Pallid Bat	--	--
Townsend's Big-eared Bat	Candidate	Species of Concern
Black-tailed Jackrabbit	Candidate	--
White-tailed Jackrabbit	Candidate	--
Washington Ground Squirrel	Candidate	Candidate
Gray Wolf	Endangered	Endangered
Marten	--	--
Bighorn Sheep	--	--
Northwest White-tailed Deer	--	--
Elk	--	--
Rocky Mountain Mule Deer	--	--
California Floater	Candidate	Species of Concern

*Bulltrout only
**Steelhead only
-- Not listed

3.3.1 Walla Walla WRIA (32)

The majority of the Walla Walla watershed consists of steppe or shrub-steppe vegetation. Common trees and shrubs in riparian areas of the Walla Walla watershed include cottonwood, alder, willow, and red osier dogwood (Snake River Salmon Recovery Board 2011). Riparian vegetation is usually restricted to narrow strips along rivers and streams. In the recent past the Conservation Reserve Enchantment Program (CREP) has led to native tree and shrub plantings, including some coniferous species,

along many stream corridors. Uplands and foothills are dominated by dryland agriculture, with areas of intensive irrigated croplands adjacent to waterways. The Blue Mountains plateau and headwaters regions is predominantly dense conifer forests interspersed with steep grasslands sloping down to headwater streams.

Table 3-2. Riparian Assessment by Stream Reach within the Southeast Washington Recovery Management Unit

(Source: Washington State Conservation Commission, 2001)

Stream Name	Riparian Condition
WRIA 32	
Lower Touchet Subbasin	
Touchet River: L/C Trail State Park to Coppei Creek	P1
Touchet River: Coppei Creek to Hwy. 125	P1
Coppei Creek	F1, 2
Touchet River: Hwy. 125 to mouth	P2
Lower Walla Walla Subbasin	
Walla Walla River: Stateline to Mill Creek	P2
Walla Walla River: Mill Creek to McDonald Rd.	P2
Walla Walla River: McDonald Rd. to mouth	F1
Pine and Mud creeks	P2
Dry Creek: Headwaters to Hwy. 12 at Smith Rd.	F2
Dry Creek: Hwy. 12 at Smith Rd. to mouth	P2
Mill Creek: Bennington Lake Dam to mouth	P1, 2
Garrison Creek	P2
Yellowhawk Creek	F2
Cottonwood, Russell, and Reser creeks	P2
Upper Mill Creek Subbasin	
Mill Creek: Headwaters to Bennington Lake Dam	F1-G1
Mill Creek Tributaries (USFS)	G1

Key: P = Average habitat condition considered poor (not properly functioning)
F = Average habitat condition considered fair (at risk)
G = Average habitat condition considered good (properly functioning)
1 = Quantitative studies or published reports documenting habitat condition
2 = Professional knowledge of the WRIA 32, 34, 53 TAG members

It must be noted that the riparian assessment was conducted in 2000; considerable improvements to many of the rivers/streams has occurred in the last decade and this assessment warrants updating (Snake River Salmon Recovery Board, 2011)

Fish

The Walla Walla Subbasin Plan created for the Northwest Power and Conservation Council in 2004 identifies more than 30 species of fish inhabiting the Walla Walla subbasin, 17 of which are native (Table 3-3) (Walla Walla Watershed Planning Unit [WWWPU] and Walla Walla Basin Watershed Council [WWBWC] 2004). The following description of fish species of concern was included in the 2004 report, excerpted from the Draft Walla Walla Subbasin Summary (NPPC 2001a).

> "The only naturally occurring populations of anadromous fish currently present in the Walla Walla subbasin are summer steelhead (*Oncorhynchus mykiss*). Pacific lamprey (*Lampetra tridentata*), a federally listed species of concern and vulnerable listed species in Oregon, may also exist. Summer steelhead (*Oncorhynchus mykiss*) are federally listed as threatened, a candidate for listing in Washington State, and listed as vulnerable in Oregon (Columbia Basin Fish and Wildlife Authority 1999)."

> "Non-anadromous salmonids and lamprey endemic to the Walla Walla subbasin include interior redband trout (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), and mountain whitefish (*Prosopium williamsoni*), and the western brook lamprey (*Lampetra richardsoni*). Redband trout are a candidate for listing in Washington State as of June 21, 2000 (based on their similar classification as steelhead). Bull trout are federally listed as threatened under the Endangered Species Act (ESA), candidates for listing in Washington State."

Native spring Chinook (*Oncorhynchus tshawytscha*), which were last documented in the Walla Walla subbasin in the 1950s, have been reintroduced over the last decade into the Walla Walla River and Mill Creek by the Confederated Tribes of the Umatilla Indian Reservation and are successfully reestablishing a local population. Stray Fall Chinook salmon and coho salmon are occasionally present in the lowest reaches of the Walla Walla River.

Table 3-3. Fish Species Present in the Walla Walla River Subbasin

(Source: G. Mendel, WDFW, December 2000 as shown in WWWPU and WWBWC 2004, Table 2-3)

Species	Origin[1]	Location[2]	Status[3]	Comments
Bull trout (*Salvelinus confluentus*)	N	R, T	C	Headwater areas
Spring Chinook (*Oncorhynchus tshawytscha*)	H	R, T	R	Presumed hatchery strays
Fall Chinook (*Oncorhynchus tshawytscha*)	H	R, T	R	Presumed hatchery strays
Redband trout/ summer steelhead (*Oncorhynchus mykiss*)	N	R, T	C/C	Dayton return range-184-1006; Walla[2] return range – 279-815
Mountain whitefish (*Prosopium williamsoni*)	N	R, T	R	
Brown trout (*Salmo trutta*)	E	R, T	R	
Lamprey (Petromyzontidae)	N	R, T	U	brook, river
Longnose dace (*Rhinichthys cataractae*)	N	R, T	R/I	
Speckled dace (*Rhinichthys osculus*)	N	R, T	A	
Umatilla dace (*Rhinichthys umatilla*)	N	R, T	I	
Leopard dace (*Rhinichthys falcatus*)	N	R, T	I	
Chiselmouth (*Acrocheilus alutaceus*)	N	R, T	C	
Peamouth (*Mylocheilus caurinus*)	N	R, T	I	
Redside shiner (*Richardsonius balteatus*)	N	R, T	C	
Northern pikeminnow (*Ptychocheilus oregonensis*)	N	R, T	C	
Sucker (Catostomidae)	N	R, T	C	Bridgelip, largescale

Species	Origin[1]	Location[2]	Status[3]	Comments
Carp (*Cyprinus carpio*)	E	R, T	R/I	Common in lower sections of the Walla Walla and Touchet
Bullhead catfish, brown (*Ameiurus nebulosus*)	E	R, T	R/I	Yellow, black
Tadpole madtom (*Notorus gyrinus*)	E	R, T	R/I	
Channel catfish (*Ictalurus natalis*)	E	R, T	C/I	(C) lower mainstem
Smallmouth bass (*Micropterus dolomieu*)	E	R, T	C/I	Common in lower sections of the Walla Walla and Touchet
Largemouth bass (*Micropterus salmoides*)	E	R, T	R/I	
Pumpkinseed (*Lepomis gibbosus*)	E	R, T	I	
Bluegill (*Lepomis macrochirus*)	E	R, T	R/I	
White crappie (*Pomoxis annularis*)	E	R, T	C/I	(C) lower mainstem
Black crappie (*Pomoxis nigromaculatus*)	E	R, T	C/I	(C) lower mainstem
Warmouth (*Lepomis gulosus*)	E	R, T	I	
Yellow perch (*Perca flavescens*)	E	R, T	I	
Paiute sculpin (*Cottus beldingi*)	N	R, T	C	
Margin sculpin (*Cottus marginatus*)	N	R, T	C	
Torrent sculpin (*Cottus rhotheus*)	N	R, T	R	
3-spine stickleback (*Gasterosteus anculeatus*)	E	R, T	R/I	
Sandroller (*Percopsis transmontana*)	N	R, T	I	

[1]Origin: N=Native stock, E=exotic, H=Hatchery reintroduction

[2]Location: R=mainstem rivers and Mill Creek, T=tributaries, P=ponds

[3]Fish species abundance based on average number of fish per 100m2: A=abundant, C=common R=rare, U=uncommon, and I =insufficient data

Wildlife

The Walla Walla subbasin is inhabited by approximately 10 amphibian species, 207 bird species, 69 mammal species, and 15 reptile species during all or part of the year (NPPC 2001). Forty-two of these species have listed or candidate status in Oregon State, Washington State, and/or at the federal level, or are of special concern to the USFS (NPPC 2001a; Table 3-4). Many species in the subbasin that are not yet listed have been identified as having declining population trends.

Table 3-4. Listed Wildlife Species within the Walla Walla Subbasin

(Source: Washington Department of Fish and Wildlife 2000a; Oregon Department of Fish and Wildlife 2000a; U. S. Forest Service 1990, as shown in WWWPU and WWBWC 2004, Table 2-4)

Species	Status[1]
American marten (*Martes americana)*	OR-SV, FS-MIS
Bank swallow (*Riparia riparia)*	OR-SU
Black-backed woodpecker (*Picoides arcticus)*	WA-C
Boreal owl (*Aegolius funereus)*	OR-SU
Burrowing owl (*Athene cunicularia)*	WA-C, OR-SC, US-SpCon
Ferruginous hawk (*Buteo regalis)*	WA-T, OR-SC, FS-S, US-SpCon
Flammulated owl (*Otus flammeolus)*	WA-C, OR-SC, FS-S
Fringed myotis (*Myotis thysanodes)*	OR-SV, US-SpCon
Golden eagle (*Aquila chrysaetos)*	WA-C
Grasshopper sparrow (*Ammodramus savannarum)*	OR-SV
Great gray owl (*Strix nebulosa)*	OR-SV, FS-S
Loggerhead shrike (*Lanius ludovicianus)*	WA-C, OR-SV,US-SpCon
Long-billed curlew (*Numenius americanus)*	OR-SV
Long-eared myotis (*Myotis evotis)*	OR-SU, US-SpCon
Long-legged myotis (*Myotis volans)*	OR-SU,US-SpCon
Lynx (*Lynx canadensis)*	WA-T,US-T
Merriam's shrew (*Sorex merriami)*	WA-C
Northern goshawk (*Accipiter gentilis)*	WA-C, OR-SC, US-SpCon
Northern leopard frog (*Rana pipiens)*	WA-E
Northern pygmy-owl (*Glaucidium gnoma)*	OR-SC
Olive-sided flycatcher (*Contopus borealis)*	OR-SV, US-SpCon
Pallid bat (*Antrozous pallidus)*	OR-SV
Peregrine falcon (*Falco peregrinus)*	WA-E, OR-E, FS-S, US-E
Pileated woodpecker (*Dryocopus pileatus)*	WA-C, OR-SV,FS-S
Preble's shrew (*Sorex preblei)*	FS-S
Pygmy nuthatch (*Sitta pygmaea)*	OR-SC
Rocky mountain elk (*Cervus elaphus)*	FS-MIS
Sage thrasher (*Oreoscoptes montanus)*	WA-C
Sagebrush lizard (*Sceloporus graciosus)*	OR-SV, US-SpCon
Silver-haired bat (*Lasionycteris noctivagans)*	OR-SV
Striped whipsnake (*Masticophis taeniatus)*	WA-C
Swainson's hawk (*Buteo swainsoni)*	OR-SV,FS-S
Tailed frog (*Ascaphus truei)*	OR-SV, US-SpCon
Three-toed woodpecker (*Picoides tridactylus)*	OR-SC, FS-MIS
Vaux's swift (*Chaetura vauxi)*	WA-C
Washington ground squirrel (*Spermophilus washingtoni)*	WA-C, US-C
Western boreal toad (*Bufo boreas)*	WA-C, OR-SV, US-SpCon
Western small-footed myotis (*Myotis ciliolabrum)*	OR-SU, US-SpCon
White-headed woodpecker (*Picoides albolarvatus)*	OR-SC, FS-MIS

Species	Status[1]
White-tailed jackrabbit (*Lepus townsendii)*	WA-C, OR-SU
Wolverine (*Gulo gulo)*	WA-C, OR-T, FS-S US-SpCon

[1]Key: WA-Washington State Listed; OR-Oregon State Listed; FS-Forest Service Listed; US-Federally Listed; E-Endangered; T-Threatened C-Candidate; SC-Sensitive, Critical; SV-Sensitive, Vulnerable; SU-Sensitive, Unknown; SpCon-Species of Concern; S-Sensitive; MIS-Management Indicator

3.3.2 Lower Snake WRIA (33)

The riparian vegetation in the Lower Snake subbasin includes herbaceous vegetation with some shrubs and trees. In some areas, the riparian trees are as tall as 30 feet and the buffer as wide as 40 feet (Kuttel 2002). Riparian conditions have improved in the last decade, as a result of implementation of the Conservation Reserve and Enhancement Program (CREP) where nearly 80% of all CREP-eligible/salmon bearing streams now have riparian buffers.

Fish

The Lower Snake Subbasin Plan created for the Northwest Power and Conservation Council in 2004 identified 18 native and 17 introduced fish species in the Lower Snake subbasin (Pomeroy Conservation District [PCD] 2004; Table 3-5). The white sturgeon is a state species of concern in Idaho, and bull trout is listed as a threatened species in the Snake River Basin.

Table 3-5. Composite Resident Fish Species List and Sources of Data for the Lower Snake River

(Source: Army Corps of Engineers 1999 as shown in PCD 2004 Table 2-2.)

Common Name	Scientific Name	Bennett *et al.* (1983)	BRD-ODFW (1991)	SOR (1995)
White sturgeon	*Acipenser transmontanus*	X		X
Rainbow trout	*Oncorhynchus mykiss*	X		X
Kokanee	*Oncorhynchus nerka*	X	X	X
Mountain whitefish	*Prosopium Williamsoni*	X		X
Brown trout	*Salmo trutta*	X		X
Bull trout	*Salvelinus confluentus*		X	X
Chiselmouth	*Acrocheilus alutaceus*	X		X
Common carp	*Cyprinus carpio*	X		X
Peamouth	*Mylocheilus caurinus*	X	X	X
Northern pikeminnow	*Ptychocheilus oregonensis*	X	X	X
Longnose dace	*Rhinichthys cataractae*		X	X
Speckled dace	*Rhinichthys osculus*	X	X	X
Redside shiner	*Richardsonius balteatus*	X		X
Bridgelip sucker	*Castosmos columbianus*	X		X
Largescale sucker	*Catostomus macrocheilus*	X	X	X
Yellow bullhead	*Ameiurus natalis*	X	X	X
Brown bullhead	*Ameiurus nebulosus*	X	X	X
Channel catfish	*Ictalurus punctatus*	X		X
Tadpole madtom	*Noturus hyrinus*	X	X	X
Flathead catfish	*Pylodictus olivaris*	X	X	X

Common Name	Scientific Name	Bennett *et al.* (1983)	BRD-ODFW (1991)	SOR (1995)
Mosquitofish	*Gambusia affinis*			X
Three-spine stickleback	*Gasterosteus aculeatus*			
Sandroller	*Percopsis transmontana*			X
Pumpkinseed	*Lepomis gibbosus*	X	X*	X
Warmouth	*Lepomis gulosus*	X	X	X
Bluegill	*Lepomis macrochirus*	X	X	X
Smallmouth bass	*Micropterus dolomieui*	X		X
Largemouth bass	*Micropterus salmoides*	X	X	X
White crappie	*Pomoxis annularis*	X	X	X
Black crappie	*Pomoxis nigromaculatus*	X		X
Yellow perch	*Perca flavescens*	X	X	X
Walleye	*Stizostedion vitreum*		X	X
Prickly sculpin	*Cottus asper*	X	X	X
Mottled sculpin	*Cottus bairdi*	X		X
Paiute sculpin	*Cottus beldingi*	X		X
Banded killfish **	Fundulus diaphanous	N.A.	N.A.	N.A.
American shad ***	Alosa sapidissima	N.A.	N.A.	N.A.

Note: Bennett *et al*. (1983) reflects sampling by multiple gear types in the four reservoirs.
BRD-Oregon Department of Fish & Wildlife (ODFW) (1991) reflects sampling by electrofisher and includes sampling in the unimpounded Snake River above Asotin, Washington.
SOR (1995) is a compilation of data from various sources, including the Snake River below Ice Harbor Dam.
*Questionable record.
**Added per personal communication between Dave Bennett and Glen Mendel, WDFW, due to recent discovery above Lower Granite Dam
*** American shad are also presented in the portion of the Snake River mainstem that flows through the Lower Snake Subbasin (see <http://www.fpc.org/CurrentDaily/7day-ytd_adults.htm> for 2004 adult passage counts at the mainstem Columbia and Snake River dams)

The following discussion of anadromous fish populations in the Lower Snake subbasin was included in the 2004 subbasin report, as excerpted from the Draft Lower Snake Subbasin Summary (NPPC 2001b).

> "Salmon populations in the Snake River have been listed under provisions of the U.S. Endangered Species Act (ESA). The pertinent listed species are Snake River sockeye salmon (Oncorhynchus nerka, listed as endangered in 1991), Snake River spring/summer and fall chinook salmon (O. tshawytscha, both listed as threatened in 1992), and Snake River steelhead (O. mykiss, listed as threatened in 1998)...
>
> [Spring chinook salmon] was listed as threatened in 1992. Spring and summer Chinook migrate through the mainstem Snake River, but no spawning or rearing is known to occur there or in any of the minor tributaries in this subbasin, except the Tucannon River where an endemic stock persists.
>
> Fall chinook salmon were listed as threatened under the Endangered Species Act in 1992. Fall chinook salmon are unique in that they spend the entire freshwater

portion of their life cycle in main-stem habitats. Historically, the majority of Snake River fall chinook salmon apparently spawned in the mainstem near Marsing, Idaho (Haas 1965; Irving and Bjornn 1981).

Construction of the Hells Canyon complex (1958-1967) and the Lower Snake River Dams (1961-1975) eliminated or severely degraded 530 miles of spawning and rearing habitat for fall chinook in the Snake River (Mendel 1998). Historically, fall chinook salmon runs averaged 72,000 fish between 1938-1949, with highs of up to 120,000 (Irving and Bjornn 1981). By the 1950s these runs had decreased to an average of 29,000. Fall chinook continued to decline, and by the late 1960s and 1970s the average run was only 5,100 fish at Ice Harbor Dam. The average annual runs have remained at 4,700-5,500 fish in the 1980s and the 1990s…

Wild coho [salmon] are extinct in the Snake River basin since the early to mid-1980s. Hatchery coho are being reintroduced in the Clearwater River by the NPT. Also, there may be stray coho from the Umatilla, and possibly the Yakima reintroduction efforts in the Snake River. Some of these fish are recovered at Lyons Ferry Hatchery or in the Tucannon River since about 1997.

Information on Snake River steelhead is limited because it is difficult to develop stock-specific estimates of abundance and survival. Additionally, it is nearly impossible to obtain accurate redd counts for Snake River steelhead because of their spawning locations and timing…"

Wildlife

A diverse variety of wildlife species are found in the Lower Snake Subbasin. Population status varies by area and species; several species are listed as state threatened, candidate, or species of concern (NPPC 2001b; Table 3-6). Big game, upland birds, diversity species, furbearers, and waterfowl are managed by state and federal agencies (NPPC 2001b).

Table 3-6. Status of Priority Habitat Species (PHS) within the Lower Snake River sub-basin

(Source: WDFW data as shown in NPPC 2001b, Table 41)

Species	Status	Population
Ferruginous hawk	T	5 nesting pairs?
Prairie falcon	PHS	13 eyries*
Peregrine falcon	E & PHS	None
Ringneck pheasant	G	declining
Whitetailed jackrabbit	C, SC	unknown

Species	Status	Population
Washington ground squirrel	SC	unknown
Mule deer	G	lowlands
Burrowing owl	C	5 nesting pairs
Sharptail grouse	T	extirpated
Blacktailed jackrabbit	C	low
Whitetail deer	G	increasing
Northern grasshopper mouse		unknown
Sagebrush vole		unknown
Washington ground squirrel	C	low
Upland sandpiper	E	unknown
Long-billed curlew		low
Loggerhead shrike	C, SC	unknown
Sage sparrow	C	unknown
Sagebrush lizard	SC	unknown
Sage thrasher	C	unknown
Bald eagle	T	wintering
Striped whipsnake	C	unknown
Kangaroo rat		unknown

* 1988 survey
State Status: E = endangered, C = candidate, T = threatened, SC = species of concern,
G = game species. PHS = Priority Habitat Species

There are a variety of plant communities present along the Snake River with small patches of riparian forest dominated by contiguous shrub communities along the riparian fringe. The two significant native plant communities that grow along riparian edge in this area are the black cottonwood (*Populus trichocarpa*) community and coyote willow (*Salix exigua*)/false indigo (*Amorpha fruticosa*) community. Other dominant native trees along the riparian edge are white alder (*Alnus rhombifolia*) and peachleaf willow (*Salix amygdaloides*); however, the riparian areas have been so impacted that only very small groves or single trees are now growing along the riverbank. As the elevation increases from the river's edge, the riparian fringe ends quickly, changing to drier grass-dominated communities and sagebrush uplands. The upland is dominated by sagebrush communities, including the big sagebrush, stiff sage, and grey rabbitbush community and sagebrush and rabbitbush community, in non-irrigated areas. Wildlife is generally abundant close to riparian corridors, and many species of mammals, birds, amphibians, and reptiles inhabit riparian corridors for part of, or the entire year.

3.3.3 Columbia River

Hundreds of fish and wildlife species reside in or migrate through the Columbia River. At least 51 species of fish, including thirty native species, have been reported from the mainstem Columbia River between Wanapum and The Dalles Dams (Ward et al. 2001). Fall Chinook salmon are the dominant salmonids during spring in nearshore areas. Other numerically significant species during the spring period are redside shiners, carp, largescale suckers, northern pikeminnow, and peamouth (Ward et al. 2001).

In 2005, wild populations of salmon in the Columbia River basin represented only 12% of their historic numbers (Bottom et al. 2005). All 13 ESA-listed evolutionary significant units (ESUs) of salmon (*Oncorhynchus* spp.) and steelhead (*O. mykiss*) in the Columbia basin use the mainstem Columbia River for migration to and from freshwater natal areas to the Pacific Ocean (National Marine Fisheries Service (NMFS) 2009). Most of the ESA-listed species spawn and incubate in tributaries, but some populations of fall Chinook and chum salmon spawn in the mainstem itself.

At least 258 species of birds, 44 species of mammals, and 21 species of reptiles and amphibians have been reported from habitats along or near the mainstem Columbia River between Wanapum and The Dalles Dams (Ward et al. 2001). The middle Columbia River mainstem supports one of the largest Northwest concentrations of wintering waterfowl, particularly Canada geese and mallards (Ward et al. 2001). The reservoirs support colonies of colonial nesting birds, most of which forage primarily on fish. The river is an important migratory stopover and staging area for many species of shorebird as well, including long-billed curlew, marbled godwit, long-billed dowitcher, black-crowned night heron, and several gull and sandpiper species, some of which also nest on the river.

Riparian vegetation and cliffs in this subbasin provide nesting opportunities for several species of raptors. The State-threatened ferruginous hawk occurs in the area, as well as bald and golden eagle, northern goshawk, Swainson's hawk, osprey, peregrine and prairie falcons, and several more common buteos and accipiters. Burrowing owl occurs in adjacent open terrain, which also serves as foraging habitat for many other birds of prey.

Many species of passerine birds also occur along the Columbia River, typically foraging on insects associated with riverine and wetland habitats. Species occurring along the Columbia that are particularly dependent on riparian areas and wetlands include common yellowthroat, yellow warbler, Wilson's warbler, yellow-breasted chat,

Nashville warbler, warbling vireo, cedar waxwing, marsh wren, American pipit, red-winged blackbird, and several of the swallows.

3.4 Major Land Use Changes

3.4.1 Walla Walla WRIA (32)

Historically, the Walla Walla watershed lowlands were characterized by shrubs, herbaceous plants, and grasses (Snake River Salmon Recovery Board 2011). Trees were limited to areas of higher groundwater near streams. Much of that vegetation has been reduced or replaced by rangeland and cropland uses, and by commercial development near the Cities of Walla Walla and College Place. Vineyards and orchards now account for more than 3,800 acres of land within the county (Snake River Salmon Recovery Board 2011).

Dams in the Walla Walla watershed include Hofer Dam in the lower Touchet, Burlingame Dam in the Walla Walla River, and the Mill Creek Project (Bennington Dam) in Mill Creek upstream of the City of Walla Walla. The upper portion of Mill Creek is protected by the Mill Creek watershed, and this area has maintained a natural flow regime (Snake River Salmon Recovery Board 2011). Surface water is over-appropriated in many of the streams in Walla Walla County, and the entire Touchet River has been closed to further consumptive appropriations of surface water between June 1 and October 1, since 1977. In addition to surface water limitations, many reaches have been altered by diking, diversion, and/or channelization. A settlement between the irrigation districts and the U.S. Fish and Wildlife Service (USFWS) in 2000 has helped improve stream flows through the implementation of irrigation efficiencies. Several dike removal projects have also been done, in conjunction with the Confederated Tribes of the Umatilla Indian Reservation, Tri-State Steelheaders and WDFW, to reconnect the Walla Walla River to its floodplain. Removing the dikes allows the river to utilize the floodplain which has been blocked off in the past, thereby reducing water temperature and improving flow.

Approximately half of irrigation needs are met through surface water withdrawals, and the other half is met by groundwater withdrawals (Snake River Salmon Recovery Board 2011). Because groundwater and surface water are typically interconnected, pumping from either shallow overburden or basalt aquifers usually has the effect of reducing groundwater discharge to tributaries of the Snake and Columbia rivers, while pumping from deeper basalt aquifers typically leads to decreased groundwater discharge directly to the Snake and Columbia rivers (Snake River Salmon Recovery Board 2011). Many of the streams and rivers in Walla Walla County do not meet water quality standards for

temperature, primarily due to lowered summer flows (Snake River Salmon Recovery Board 2011).

The Walla Walla Watershed Management Partnership was established in 2009 under a pilot local water management program (RCW 90.92) to address low flow concerns. The Partnership has developed a Critical Low Flow Plan and worked with local irrigation districts to develop local water plans to improve low flow conditions. The Walla Walla Watershed Management Partnership is also a qualified local entity and program partner with the Columbia Basin Water Transactions Program.

Water Quality

As early as 1998, Ecology discovered the water quality data for some streams and rivers in the watershed did not meet the State's water quality standards. As a result, these streams and rivers were placed on the 303(d) list. In 2004, Ecology included additional watershed streams on the list. The streams have low dissolved oxygen, high concentrations of chlorinated pesticides and PCBs, high temperatures, fecal coliform bacteria, and pH levels.

Portions of the Walla Walla River and its tributaries have been listed by the state of Washington for non-attainment of the human health criteria for several chlorinated pesticides, and polychlorinated biphenyls (PCBs).

Ecology began a water quality improvement project (also known as a Total Maximum Daily Load or TMDL) in the watershed to bring streams and rivers into compliance with State water quality standards. Due to the size and complexity of the Walla Walla watershed, Ecology developed four different TMDLs in the watershed:

- **Chlorinated pesticides and PCBs**: Chlorinated pesticides and PCBs are chemicals that are recognized as known or possible human carcinogens. Although these chemicals were banned in the U.S. in the 1970s and 1980s, they are often called “legacy pollutants” because they persist in the environment for many years.
- **Fecal coliform bacteria**: These bacteria are found in the feces of warm-blooded animals. When found in bodies of water, fecal coliform can indicate the presence of other pathogens.
- **Temperature**: When water temperatures are too high, streams can become uninhabitable for fish and other aquatic animals. Many salmon and trout species may suffer decreased spawning success and even death when waters

are too warm. In addition, warmer water tends to have lower dissolved oxygen levels.

- **Dissolved oxygen and pH**: Dissolved oxygen (DO) is necessary for fish to breathe. pH affects the chemistry and chemical reactions that take place in the water, such as the solubility of nutrients and metal compounds.

The Environmental Protection Agency (EPA) approved all four TMDLs by August 2007. In addition to working on these TMDLs, Ecology and the Walla Walla Watershed Planning Unit's Water Quality Subcommittee continued their partnership to write a water quality implementation plan. The implementation plan guides the work that is planned to improve water quality. The plan was completed in December, 2008. Over fourteen organizations committed to help improve water quality by educating the public, restoring native trees and shrubs along streams, reducing pollution in stormwater, and installing off-stream water troughs and fences to control livestock. The Water Quality Subcommittee prioritized streams in the watershed where work to improve water quality should begin. Ecology staff are currently providing technical assistance and working with organizations in these prioritized areas. Actions identified in the TMDL are identified in Table 3.7. Specific Category 4 and 5 water quality listings by reach are provided in the Inventory Data Summary Table in Appendix C.

Table 3.7. Actions Identified to Improve Water Quality in the Walla Walla Basin

(Adapted from Table 8 in *Walla Walla Watershed PCBs, Chlorinated Pesticides, Fecal Coliform, Temperature, pH & Dissolved Oxygen Total Maximum Daily Load Water Quality Implementation Plan* (Washington Department of Ecology, 2008))

Organization	**Pollution Source**	**Action**	**Performance Measures**		**Parameter**
			Where	**When**	
Columbia Conservation District, NRCS, and FSA	upland	install riparian buffers	CREP eligible reaches	landowner driven	temperature, bacteria, dissolved oxygen, nutrients, turbidity
		direct seeding	site specific	landowner and referral driven	sediment, nutrients
	livestock	fencing	CREP eligible reaches	referral and funding driven	bacteria, dissolved oxygen, temperature, nutrients
		off-site water	site specific	referral and funding driven	
Koosksooskie Commons	lawns and small acreages	education and restoration by Walla Walla Backyard Stream Team	Yellowhawk Creek	on-going	bacteria, dissolved oxygen, temperature, nutrients
		Yellowhawk streamkeepers-Urban Backyard Riparian Restoration	Garrison Creek in Fort Walla Walla Park	on-going	
		education and outreach on stream restoration	60-house development on Yellowhawk Creek	on-going	
Priority Projects Group*	land conversion	3 -5 acre wetland restoration	North Fork Reser Ck	2010	temperature, dissolved oxygen
		3 -5 acres upland steppe restoration	Walla Walla basin	2010 -2011	
Tri-State Steelheaders	bank erosion, lack of riparian buffer	woody bank armor, riparian planting and conservation easement	Walla Walla River	2006 -2008	bacteria, dissolved oxygen, temperature, nutrients, turbidity
		Large woody debris and riparian planting	Touchet River	2007-2008	

Organization	Pollution Source	Action	Performance Measures		Parameter
			Where	When	
	agriculture and land development	conservation easement	North Fork Coppei Creek	2005 -2008	
		conservation easement	Mill Creek	2007 -2008	
	bank erosion, livestock	riparian planting, pasture fence setback	Russell Creek	2007 -2008	
		Pasture fence setback, riparian planting	Yellowhawk Creek, Caldwell Creek	2009	
		riparian planting, livestock setback exclusion	Walla Walla River	2010 -2011	
	agriculture	restore 3-acre wetland with a 14 acre native plant buffer	Reser Creek drainage	2008 -2012	
U.S. Army Corps of Engineers -Walla Walla	stormwater	riparian planting	Nursery St. Bridge in Oregon	possibly 2009 -2010	temperature
	channelization	feasibility study	Walla Walla Basin	ongoing	flow
City of Walla Walla	Stormwater	place no dumping placards	1000 storm drains discharging to streams	2008-2009	bacteria, dissolved oxygen, temperature, nutrients, turbidity
		Sweep streets	arterials	every week	
			Residential streets	every 2 months	
		maintain BMPs required by stormwater permit	city wide	yearly	
	urban/rural	composting for residents collect household hazardous waste	city wide	yearly	bacteria, dissolved oxygen, nutrients
			city wide	yearly	toxic chemicals
	all/varies	Publish 4 articles, bill inserts, or TV spots about water quality	city wide (10,000 customers)	yearly	bacteria, dissolved oxygen, temperature, nutrients, turbidity
W A State Dept. of Ecology	All sources	award grants and loans for implementation activities	basin wide	annual competitive cycle	turbidity, total suspended solids,

Organization	Pollution Source	Action	Performance Measures		Parameter
			Where	When	
		provide technical assistance		when needed	temperature, nutrients, bacteria
		provide education and outreach		when needed	
		monitor water quality		as funding allows	
		inspect DMRs and facilities		as required by permit	
		follow up on complaints, referrals and enforcement		as received	
W A State Dept. of Transportation	highway construction	increase infiltration	Highway 12 plus an additional 5 acres	2008 -2011	dissolved oxygen, nutrients, pH, turbidity
Walla Walla County Public Works Department	road construction	develop stormwater management plan; use BMPs	on-site	during construction	turbidity, total suspended solids
	bridge construction projects	develop stormwater management plan, use of BMPs, riparian restoration at bridge, comply with federal and state regulations		during construction	
	rock crushing	develop stormwater management plan; use BMPs; comply with DNR requirements		during operations	turbidity, total suspended solids
	county facilities	develop storm water management plan; use BMPs		on-going	
	new county roads for housing developments	develop stormwater management plan; use BMPs		during construction	
	new county roads for industrial and commercial development	develop stormwater management plan; use BMPs during construction		during construction	

Organization	Pollution Source	Action	Performance Measures		Parameter
			Where	When	
	direct discharge of stormwater into streams	evaluate on case-by-case basis		when needed	turbidity, total suspended solids, temperature, nutrients, bacteria
	herbicide applications near waterways	use aquatic herbicides per regulations		during application	toxic chemicals
	de-icing applications	use non-toxic solutions		during application	
Walla Walla Community College's Water and Environment Center	varies	Education on rural and upland BMPs	Workshops within the entire watershed	annually	Bacteria, dissolved oxygen, temperature, nutrients, turbidity
Walla Walla Community College	channelization	Remove cement-lined pond and install a buffer	Titus Creek	2008-2009	Bacteria, temperature, dissolved oxygen, nutrients, turbidity
Walla Walla County Conservation District, NRCS, and FSA	livestock	Install 810 acres riparian buffers	Touchet and Walla Walla rivers; Dry, Doan, and Cottonwood creeks	2008-2012	Bacteria, temperature, dissolved oxygen, nutrients, turbidity
Walla Walla County Conservation District	Urban areas	Install 9 to 15 urban buffers	Urban streams	fall 2007-spring 2010	temperature, dissolved oxygen, nutrients, sediment, turbidity
	Irrigation canals	6 miles of piping	Touchet River basin-Eastside Irrigation District	2008-2009	
		piping (undetermined amount)	Old Lowden	2009-2010	
			Bergevin-Williams	2009-2010	
			Gardena	2010-2011	
			Lowden	2010-2011	
	channelization	Creek restoration, including meander reconstruction	Doan Creek east of Last Chance Road	2010	

*Priority Projects Group consists of: Walla Walla County Conservation District, Tri-State Steelheaders, Washington State Department of Fish and Wildlife, Confederated Tribes of the Umatilla Indian Reservation, and Blue Mountain Land Trust

3.4.2 Lower Snake WRIA (33)

Historically, the Lower Snake River watershed was covered by grasslands and shrub-steppe vegetation. In areas adjacent to streams, vegetation consisted of grasses, shrubs, and large trees (e.g., willow, cottonwood, birch, and alder) (Snake River Salmon Recovery Board 2011). As a result of land use changes and development, much of the historic prairie, shrub-steppe, and riparian habitats have been lost or modified. However, as noted in the previous section, implementation of the CREP over the last decade has improved riparian conditions for most CREP eligible/salmon bearing streams.

The hydrology along the Snake River has been severely altered by the installation of hydroelectric dams. The Corps operates four dams in the Snake River basin. The two lower dams, Ice Harbor and Lower Monumental Dams occur in Walla Walla County. The dams on the Lower Snake and Columbia Rivers impound water, creating shallow reservoirs that typically fill the width of the steep-sided canyons.

These impoundments aid navigation for shipping barges and provide access to private industrial and agricultural docks on the Snake River. Barges from these facilities travel downriver through the locks at Lower Monumental and Ice Harbor to Port of Walla Walla facilities at the Burbank Industrial Park or beyond to the Tri-Cities or the Port of Benton.

In addition to alteration of the natural shoreline through water impoundment, the private and Port-owned dock sites have further altered the shoreline through the placement of piers and other in-water structures, as well as rip-rap and other shoreline protection structures.

McNary Wildlife Refuge

The McNary National Wildlife Refuge (NWR) is located in rural Burbank, extending along the east bank of the Columbia River, from the confluence of the Snake River to the mouth of the Walla Walla River, and downstream into Oregon.

Established in 1956, the McNary NWR was created to replace wildlife habitat lost to construction of the McNary Dam downstream. The 15,000 acres of sloughs, ponds, streams and islands—riparian and wetland habitat—as well as upland shrub-steppe and cliff-talus habitat are important to migratory waterfowl, shorebirds and songbirds. Few areas in North America support such dense concentrations of waterfowl; more than half the mallards in the Pacific Flyway travel over McNary National Wildlife Refuge's rich diversity of wetland habitat created by the damming of the Columbia River. The dam

highly altered the natural ecosystems and provided management challenges for the U.S. Fish and Wildlife Service. These challenges include artificial river operations, widespread nonnative invasive plant and animal species introduction, and extensive land use conversion and fragmentation. McNary NWR staff use a variety of carefully chosen habitat management techniques to maintain, recover, or enhance habitat for wildlife.

Management of seasonal wetlands involves the manipulation of water levels to encourage native food supplies and promote the diverse wetland plant growth that provides a variety of food and shelter for wildlife. Some wetlands are burned and disked to remove undesirable plant growth and create open areas. Shoreline burning and mowing also create open beach areas that waterfowl use for courting, feeding, resting and raising young. Seasonally flooded wetlands provide resting and feeding areas and are especially important to waterfowl during fall migration.

Upland areas, replete with sagebrush, rabbitbrush, and bunchgrasses, provide forage for deer and nesting sites for pheasants, ducks, California quail, and burrowing owls. Refuge managers improve uplands through prescribed burning, removal of exotic weed species, and planting of native grasses.

Riparian areas supply food, plants, water, nesting sites, and shelter for a wide variety of wildlife. Cottonwoods and willows in riparian areas provide essential nesting habitat for migratory songbirds like yellow warblers and willow flycatchers. Management practices in riparian areas include planting native willows and cottonwoods.

Approximately 700 acres of refuge lands are irrigated croplands, which provide food and cover for wildlife. Farmers grow corn, wheat, alfalfa and other crops under a cooperative agreement whereby the refuge's share of the crop is left in the field for wildlife. These crops provide an extremely valuable source of high energy food for waterfowl, especially in late winter when other food sources may be exhausted or covered by snow.

Water Quality

The Lower Snake River water quality is impaired by several pesticides, dioxin, PCBs, temperature, dissolved oxygen, and phosphorus. Data used for these determinations were collected from water, sediment, or fish tissue. Many of the pesticides and PCBs are legacy chemicals contained in sediments, but no longer actively used by agriculture, industry, or municipalities. TMDLs have been developed for dioxin and dissolved oxygen. See the discussion in Section 3.4.1 above for more detail

3.4.3 Columbia River

Human influences have resulted in substantial changes to the shoreline of the Columbia River. The most significant changes to the River's shoreline have resulted from European settlement following the Lewis and Clark expedition in the early 1800s.

The 21 dams built on the Columbia and Snake Rivers since 1933 have substantially altered the Columbia River hydrograph. Dam operations have reduced the frequency of spring freshets, which historically helped maintain floodplain habitat connectivity and aided the migration of juvenile salmon. As a result, over-bank flows and associated large woody debris (LWD) recruitment and sediment transport processes have been substantially reduced.

Today, the Columbia basin supports significant water-dependent commercial and industrial uses, ports, transportation, and urban population centers. The Port of Walla Walla, founded in 1952 in anticipation of the completion of the McNary Dam, serves as the primary economic development agency in the region. The shoreline sites that currently comprise Wallula, Attalia, and Burbank were purchased from the federal government by the Port and used to attract industry to the newly-accessible western portions of Walla Walla County. Today, the Port manages a number of industrial sites on the Columbia River, including the Wallula Gap Industrial Park-Shipping Terminal, located just south of the mouth of the Walla Walla River. The site functions as an intermodal shipping terminal with barge moorage and public rail line access for shipping goods inland. In addition to Port of Walla Walla facilities, several privately owned industrial sites also dot the Columbia River shoreline, several with their own dock facilities.

In these developed areas, riprap and docks have replaced riparian vegetation, and rip rap revetments now comprise a significant portion of the reservoir shorelines. Historic and ongoing dredging operations are responsible for maintaining a viable navigation channel to support five deep-water ports, which transport 30 million tons of goods annually.

Water Quality

Within Lake Wallula, water quality is strongly influenced by the Snake and Yakima rivers. Flow from the Snake, Yakima, and Columbia Rivers are not fully mixed until they reach McNary Dam (Ward et al. 2001). The Snake River-influenced portion on the southeast side of the river experiences high turbidity and a high nutrient load, and the Yakima River-influenced portion experiences lower turbidity (Ward et al. 2001). The

Lake Wallula area is on the state 303(d) list for temperature impairments. Additionally, TMDLs have been prepared for PCB, Hexachlorobenzene and dioxin for other portions of the Columbia within Walla Walla County shoreline jurisdiction. For all shoreline jurisdiction waterbodies, water quality listings by reach unit used for analysis in Chapter 5 can be found in Appendix B.

4 SHORELINE INVENTORY

4.1 Inventory Sources

Development of a shoreline inventory is intended to record the existing or baseline conditions upon which the development of SMP provisions will be examined to ensure the adopted regulations provide no net loss of shoreline ecological functions. At a minimum, local jurisdictions shall gather the inventory elements listed in the WAC Guidelines, to the extent information is relevant and readily available. Collected information principally included Watershed Resource Inventory Area (WRIA) and other basin documents, Walla Walla County studies, scientific literature, aerial photographs, and Geographic Information Systems (GIS) data from a variety of data providers.

Table 4-1 lists those relevant inventory elements for which data is available for the County's shorelines. The table also describes the information collected for each of the required inventory elements. Map figures are provided in the Map Folio (Appendix B), and they depict the various inventory pieces listed in the table, as well as additional analysis. Data gaps and limitations are discussed further in Section 4.2. The WAC Guidelines do not require generation of new information or mapping to fill identified data gaps.

Table 4-1. Shoreline Inventory Elements and Information Sources.

Inventory Element (corresponding map numbers in the Inventory Map folio, Appendix B)	**Information Gathered**	**Data Source(s)**	**Use/Assumptions/Limitations**
Surficial Geology (Map 14)	Geologic classifications	WA Department of Natural Resources, Division of Geology and Earth Resources, Surface Geology	• Based on broad-scale geologic classifications • Useful for broad-scale assessment of geologic conditions • ***Not to be used in place of site-specific studies***
Soils (Maps 15, 15a)	Soil types (Soil Survey Geographic Database)	USDA NRCS (SSURGO)	• Based on broad-scale soil mapping • Useful for broad-scale assessment of soil conditions • ***Not to be used in place of site-specific studies***
Surface water (Map 12)	• Waterbodies and watercourses (e.g. rivers, streams, reservoirs) • Stormwater system (e.g. culverts, outlets)	• County (waterbodies and watercourses, stormwater discharge point, infiltration pond) • City of Walla Walla (watercourse, city stormwater culverts and mains) system	Ordinary High Water Mark (OHWM) and stream centerlines have been used to create the Shoreline Jurisdiction boundary. For most areas within Walla Walla County, these data layers are fairly accurate based on 2013 aerial photographs. However, slight adjustments were made by GIS staff from The Watershed Company to the stream centerline along the Touchet River between Lyons Ferry Road and the City of Waitsburg to more accurately reflect existing conditions near current development.
Land Use Patterns (Maps 2, 3, 4, 6)	Current land use	• County (Tax lots, assessor records) • County (Department of Revenue land use codes) • NAIP 2013 aerial photos • County/City/Town and public input	• Gross-scale characterization (e.g., residential, agriculture) • Useful in assessing existing intensity and type of development at broad-scale planning level • ***Data may not be up-to-date***
	Future land use	• Walla Walla Joint Community Development Agency (County/City	Useful to anticipate future land use changes at broad-scale planning level

Inventory Element (corresponding map numbers in the Inventory Map folio, Appendix B)	**Information Gathered**	**Data Source(s)**	**Use/Assumptions/Limitations**
		comprehensive plans, as available) • County/City zoning	
	Water-oriented uses	• County assessor • Port of Walla Walla County • NAIP 2013 aerial photos • County/City/Town and public input	
Ownership (Map 5)	Land ownership for parcels within shoreline jurisdiction	• County (taxlots) • State/federal agencies (DNR, National Forest, Corps) • Derive from Comp Plan/zoning maps, and direct County/City input as well	
Transportation (all maps)	• Highways • Railroads • Other Roads	County	
Sewer/Septic facilities (Map 13)	Septic System	County (gravity lines and septic system boundaries) City of Walla Walla (lateral lines and sewer mains)	

Inventory Element (corresponding map numbers in the Inventory Map folio, Appendix B)	**Information Gathered**	**Data Source(s)**	**Use/Assumptions/Limitations**
Impervious Surfaces (Map 8)	Land surface in a range of 0 to 100% percent of imperviousness as defined by the National Land Cover Database (NLCD	US Department of Interior, USGS (National Land Cover Database)	Useful for broad-scale assessment of impervious surfaces only
Vegetation (Map 9)	• Land cover • Vegetation type	• US Department of Interior (National Land Cover Database)	• Useful for broad-scale assessment of vegetation coverage only • ***Not useful for accurate characterization of fine-scale data (e.g., parcel level, species composition)***
Shoreline Modifications (Map 20)	Levees	WA Department of Ecology	• This dataset is a synthesis of existing information on levees in the State of WA. Primary data sources include the U.S. Army Corps of Engineers and the Federal Emergency Management Agency. Inputs from local levee managers were also used to augment the primary sources.
	Overwater structures	WA Department of Natural Resources	• Overwater structures includes structures such as piers and bridges. Dams are also depicted in DNR's overwater structures dataset. • ***Data was last updated in 2007 and has a 10-foot horizontal accuracy range*** • ***May not be useful for accurate characterization of fine scale data (e.g., parcel level)***
	Dams	WA Department of Ecology	

Inventory Element (corresponding map numbers in the Inventory Map folio, Appendix B)	**Information Gathered**	**Data Source(s)**	**Use/Assumptions/Limitations**
Public Access Areas (Map 7)	• Parks • Trails • Launches/Moorage • National Forest	• Port of Walla Walla County • County/City maps and plans • Washington State Parks • Washington Recreation and Conservation Office • U.S. Army Corps of Engineers • Department of Natural Resources • Umatilla National Forest	
Historical/ Archeological/ Cultural Sites (Map 23- historic places only)	• Historical sites • Archeologically significant sites	WA Department of Archaeology and Historic Preservation	• Archeological and culturally significant sites not mapped in shoreline inventory folio, but they are discussed in Chapter 6 • ***Mapped data represent only known historical properties or places***
Critical Areas/Other Ecological Conditions			
Geologically hazardous areas (Map 16)	Geohazards	Washington Department of Natural Resources, Geology and Earth Sciences Division	• Useful for broad scale assessment of geologically hazardous areas • ***Requires site-specific review to verify presence/absence of geohazards***
Channel migration zone (CMZ) (Map 25)	• Floodways and Floodplains • Aerial Photos • Infrastructure	• Federal Emergency Management Agency (FEMA) Q3 • Aerial photos • County	• Channel migration zone (CMZ) data is not available; therefore, the 100 year floodplain was used as a proxy for the CMZ except where areas are separated from the channel by a major, legally existing artificial structure • ***This approach typically may over-estimate the CMZ in flatter lowland areas and under-estimate the CMZ in high gradient mountainous areas.***

Inventory Element (corresponding map numbers in the Inventory Map folio, Appendix B)	**Information Gathered**	**Data Source(s)**	**Use/Assumptions/Limitations**
			• ***CMZ location maps may be modified by site-specific studies***
Frequently flooded areas (Map 10)	• Floodplains • Floodways	Federal Emergency Management Agency (FEMA) Q3	• Floodplain and floodways based on federally established models • ***May be used at site scale, although further refinement at site scale may also be desired***
Wetlands (Map 11)	• Potential wetlands	• US Fish and Wildlife Service National Wetland Inventory (NWI)	• Useful for broad scale assessment of potential wetlands • NWI mapping based on interpretation of multi-spectral imagery and ground truthing • ***Many wetlands are not identified by NWI; mapped wetlands may not meet wetland criteria*** • ***Not to be used in place of site-specific studies***
WDFW Priority Habitats & Species (Maps 17, 18, 19)	• Priority fish • Priority wildlife • Priority habitats	WA Department of Fish and Wildlife (Sept. 17, 2013)	• ***WDFW maps do not capture every priority species location or habitat, particularly for rare species or species that use shoreline habitats seasonally or intermittently*** • ***Absence of mapping information does not indicate absence of a particular species*** • ***The number of documented species may reflect the relative amount of past survey efforts*** • ***New data will need to be obtained at the time of project application***
Aquifer Recharge Areas (Map 24)	• Critical Aquifer Recharge Area • Shallow Gravel Aquifer	• Walla Walla Joint Community Development Agency • County	
Water quality impairment (Map 21)	303(d) waters and regulated sites	WA Department of Ecology (2008)	• Water quality impairments are based on monitoring at specific locations • ***Impairments may extend beyond the mapped area***

Inventory Element (corresponding map numbers in the Inventory Map folio, Appendix B)	**Information Gathered**	**Data Source(s)**	**Use/Assumptions/Limitations**
Environmental Cleanup Sites (Map 22)	Listed facilities	WA Department of Ecology	• The database is intended to show locations of all Ecology's regulated facilities of various environmental management and regulatory programs. Only sites or programs with cleanup related activities are shown on map.
Restoration opportunities (map to be created at a later date)	Site-specific and general projects	• Watershed Plans • Subbasin Plans • Tribes • Conservation Districts • County/City and public input	• Identification of potential restoration opportunities is taking place as part of this analysis. A map will be created at a later point in the SMP process • ***Restoration opportunities are not limited to those identified in this folio and report***

4.2 Data Assumptions and Data Gaps

4.2.1 Ecological Characterization

The following discussion identifies assumptions and limitations for present inventory elements, and may provide a brief County-wide or watershed-wide narrative where qualitative descriptions provide more information than quantitative measures. Despite data gaps and limitations, a substantial quantity of information is available for the shorelines of Walla Walla County and the Cities of Prescott, Waitsburg and Walla Walla, to aid in the development of the inventory and analysis report, as well as the shoreline master program.

Vegetation Coverage

Vegetative coverage data was generated using multi-spectral satellite imagery with 30x30-meter cell resolution. Spectral data was classified using Multi-Resolution Land Characteristics (MRLC) Consortium, National Land Cover (NLC) Database. Because each cell represents 900 square meters, the classification may over or under represent coverage when the type of coverage within cells is mixed. The spatial resolution of the NLC data provides a good foundation for broad scale assessment of vegetation coverage. Its utility is higher in rural areas where vegetative cover is more uniform over broad areas compared to more developed UGAs.

Because the data is based on interpretation of multi-spectral imagery, classification of some data may be inaccurate. Most notably, shrub steppe vegetation on steeper slopes is frequently miscategorized as “cultivated crops” using the NLC model. So long as the inherent inaccuracies of the data or recognized, the NLC data provides a good broad-scale assessment of vegetation coverage.

Finally, because the OWHM changes over time, water is occasionally included within the total shoreline area used for the calculation of vegetation coverage. For this reason, any area identified as “Water” was excluded from the calculation of percent coverage.

Impervious Surfaces

Similar to the vegetation coverage data, impervious surface data was generated using MRLC Consortium NLC data (2006) of multispectral satellite imagery with 30x30-meter cell resolution. National Land Cover categories that apply to areas of higher impervious surface coverage include Developed- Low, Medium, and High Intensity categories. The same limitation as the vegetation coverage data apply to impervious surfaces.

Wetlands

Wetland mapping was assembled from the National Wetlands Inventory (NWI). The NWI dataset is based on many factors, including soil inventories and aerial interpretations. Although it is very comprehensive and is fairly accurate in approximating wetland locations, it is acknowledged that many wetlands, especially small wetlands, are not identified by NWI. Likewise, some areas identified as NWI wetlands may not meet wetland criteria. The NWI map was reviewed for obvious inaccuracies, but site-scale investigation is needed to conclusively include or exclude potential wetland areas. Whether or not they are captured by this mapping effort and included in the preliminary shoreline jurisdiction maps, actual wetland conditions that may or may not be found on a site will determine shoreline jurisdiction (as a potential shoreline-associated wetland) on a site-specific basis.

Soils

Soil data are derived from the Natural Resource Conservation Service (NRCS) national soil survey. These data represent soils over broad areas; therefore, site-specific soil characteristics may differ from what is mapped. Information on alluvial soil presence and distribution was used to assess hyporheic functions.

Surficial Geology

Data on surficial geology are based on information from Washington DNR. The data is based on broad-scale geologic classifications; therefore, site-specific characteristics may differ. The map should not be used in place of site-specific studies.

Fish and Wildlife Habitat Conservation Areas

WDFW Priority Habitat and Species maps are presented as three separate units: Habitat Regions (species or habitat ranges by area), Habitat Species (precise species locations); and Fish (fish species presence).

These maps do not capture every priority species location or habitat in shoreline jurisdiction, particularly rare species or species that use the water for foraging and drinking, but that nest or den farther from the shoreline. Absence of mapping information does not indicate that a particular species does not or could not utilize the shoreline or adjacent lands. Furthermore, the number of documented species may reflect the relative amount of past survey efforts rather than the presence or absence of suitable habitat.

Frequently Flooded Areas

For all practical purposes, "frequently flooded areas" are those areas within the 100-year floodplain. Floodplain and floodway maps were developed using FEMA's Q3 map for Walla Walla County.

Channel Migration Zone

Channel Migration Zone (CMZ) data was not previously available for shorelines within Walla Walla County. For the purpose of this analysis report, the 100 year floodplain is being used as a proxy for the CMZ extent with the following conditions per WAC 173-26-221(3)(b):

- Where available data indicates areas separated from the active river channel by legally existing, publically owned and maintained, artificial channel constraints that limit channel movement, those areas are excluded from the channel migration zone.

- All areas separated from the active channel by a legally existing artificial structure(s) that are likely to restrain channel migration, including major transportation facilities, built above or constructed to remain intact through the one hundred-year flood, will not be considered to be in the channel migration zone.

In general, we expect that this approach may slightly over-estimate the CMZ in flatter lowland areas.

The CMZ map represents a graphical overlay of the different elements and does not include field surveys or onsite data collection. Approvals for projects and permits relying on these boundaries should include detailed assessments with stream surveys, particularly in active channel areas.

Geologically Hazardous Areas

Maps of geologically hazardous areas were developed by Washington Department of Natural Resources. The data primarily focus on seismic hazards, and landslide hazard data seems limited. Data on the distribution and location of steep slopes within the proposed shoreline jurisdiction were not available, and this represents a data gap. Steep slopes should be evaluated for landslide hazard potential on a site- and project-specific basis.

Water Quality

As a requirement of Section 303(d) of the federal Clean Water Act all waterbodies should be "fishable and swimmable," Ecology classifies waterbodies into five categories:

- Category 1: Meets tested standards,
- Category 2: Waters of concern,
- Category 3: No data,
- Category 4: polluted waters that either have or do not require a TMDL, and
- Category 5: polluted waters requiring a TMDL.

Individual waterbodies are assigned to particular "beneficial uses" (public water supply; protection for fish, shellfish, and wildlife; recreational, agricultural, industrial, navigational and aesthetic purposes). Waterbodies must meet certain numeric and narrative water quality criteria established to protect each of those established beneficial uses. Waterbodies may provide more than one beneficial use, and may have different levels of compliance with different criteria for those beneficial uses in different segments of the stream or lake. As a result, many waterbodies may be on the 303(d) list for more than one parameter in multiple locations.

As presented in the Water Quality map of Appendix B, only Category 4 and 5 waters are depicted. For more information on specific waterbodies and their water quality classifications, Ecology provides an interactive on-line viewer at the following website: http://apps.ecy.wa.gov/wqawa2008/viewer.htm.

Shoreline Modifications

Shoreline modifications are human-caused alterations to the natural water's edge. The most common types of shoreline modifications include overwater structures and shoreline armoring.

The Washington Department of Natural Resources has digitized piers and other in-water structures such as boatlifts, boathouses, and moorage covers. However, this dataset does not differentiate between each of these various types of overwater structures. Thus, reporting of overwater cover is usually an overstatement when assessing just piers, docks, and floats. Although not technically overwater structures, boat ramps are also reported in the inventory.

Levees were mapped based on data from the Department of Ecology. County-wide data were not available for shoreline stabilization, including rip rap armoring and dikes. A visual assessment of shoreline stabilization using aerial photography was incorporated into the analysis of ecological functions. This visual assessment is likely to underestimate the extent of armoring and diked areas.

4.2.2 Land Use Characterization

This shoreline inventory reviews current and planned land use within shoreline jurisdiction to provide a basis to establish a compatible use pattern over the 20-year planning period of the SMP and to identify current or planned preferred uses in shoreline jurisdiction that should be protected or promoted to meet SMA goals for water-oriented uses, shoreline access, and ecological protection.

The SMA promotes the following use preferences (RCW 90.58.020) for shorelines of statewide significance (identified in Section 1.2) in the stated order:

1. Recognize and protect the statewide interest over local interest;
2. Preserve the natural character of the shoreline;
3. Result in long term over short term benefit;
4. Protect the resources and ecology of the shoreline;
5. Increase public access to publicly owned areas of the shorelines;
6. Increase recreational opportunities for the public in the shoreline;
7. Provide for any other element as defined in RCW 90.58.100 deemed appropriate or necessary.

In addition, the following use preferences apply within shoreline jurisdiction in the following order [from WAC 173-26-201(2)(d)]:

1. Reserve appropriate areas for protecting and restoring ecological functions to control pollution and prevent damage to the natural environment and public health. In reserving areas, local governments should consider areas that are ecologically intact from the uplands through the aquatic zone of the area, aquatic areas that adjoin permanently protected uplands, and tidelands in public ownership. Local governments should ensure that these areas are reserved consistent with constitutional limits.

2. Reserve shoreline areas for water-dependent and associated water-related uses. Harbor areas, established pursuant to Article XV of the state Constitution, and other areas that have reasonable commercial navigational accessibility and necessary support facilities, such as transportation and utilities, should be reserved for water-dependent and water-related uses that are associated with commercial navigation unless the local governments can demonstrate that adequate shoreline is reserved for future water-dependent and water-related uses and unless protection of the existing natural resource values of such areas preclude such uses. Local governments may prepare master program provisions to allow mixed-use developments that include and support water-dependent uses and address specific conditions that affect water-dependent uses.

3. Reserve shoreline areas for other water-related and water-enjoyment uses that are compatible with ecological protection and restoration objectives.

4. Locate single-family residential uses where they are appropriate and can be developed without significant impact to ecological functions or displacement of water-dependent uses.

5. Limit nonwater-oriented uses to those locations where the above described uses are inappropriate or where nonwater-oriented uses demonstrably contribute to the objectives of the Shoreline Management Act.

Current Land Use

Existing land use provides a baseline for types of land use and land cover found within shoreline jurisdiction. Existing land use data were obtained from the Walla Walla County Assessor, Department of Revenue and Cities and then overlaid on the Shoreline Inventory Folio maps for current land use, land ownership patterns, and aerial images. Mapped assessor use types were sorted into land use categories established in WAC 458-53-030. Land use data from the County Assessor's office may not be updated as frequently as other property information; however, it represents the best readily available information on current land use at a countywide level. The predominant shoreline land use pattern across all shoreline jurisdiction analyzed is Resource Production and Extraction.

Water Oriented Use

According to Ecology's SMP Guidelines (WAC173-26-020), "water-oriented use means a use that is water-dependent, water-related, or water-enjoyment, or a combination of such uses." The Shoreline Management Act promotes uses that are "unique to or

dependent upon use of the state's shoreline," as well as "ports, shoreline recreational uses including but not limited to parks, marinas, piers, and other improvements facilitating public access to shorelines of the state, industrial and commercial developments which are particularly dependent on their location on or use of the shorelines of the state and other development that will provide an opportunity for substantial numbers of the people to enjoy the shorelines of the state." (RCW 90.58.020)

Definitions and examples of water-oriented uses are included in Table 4-2 below.

Table 4-2. Water-Oriented Uses Definitions and Examples.

Water-Oriented Use Definitions	Examples
"Water-dependent use" means a use or portion of a use which cannot exist in a location that is not adjacent to the water and which is dependent on the water by reason of the intrinsic nature of its operations. (WAC 173-26-020(39))	Examples of water-dependent uses may include ship cargo terminal loading areas, ferry and passenger terminals, barge loading facilities, ship building and dry docking, marinas, aquaculture, irrigation diversions, float plane facilities and sewer outfalls.
"Water-related use" means a use or portion of a use which is not intrinsically dependent on a waterfront location but whose economic viability is dependent upon a waterfront location because: (a) The use has a functional requirement for a waterfront location such as the arrival or shipment of materials by water or the need for large quantities of water; or (b) The use provides a necessary service supportive of the water-dependent uses and the proximity of the use to its customers makes its services less expensive and/or more convenient. (WAC 173-26-020(43))	Examples of water-related uses may include warehousing of goods transported by water, fish processing plants, hydroelectric generating plants, gravel storage when transported by barge, oil refineries where transport is by tanker, log storage, and potentially agriculture and agriculturally related water transportation systems.
"Water-enjoyment use" means a recreational use or other use that facilitates public access to the shoreline as a primary characteristic of the use; or a use that provides for recreational use or aesthetic enjoyment of the shoreline for a substantial number of people as a general characteristic of the use and which through location, design, and operation ensures the public's ability to enjoy the physical and aesthetic qualities of the shoreline. In order to qualify as a water-enjoyment use, the use must be open to the general public and the shoreline-oriented space within the project must be devoted to the specific aspects of the use that fosters shoreline enjoyment. (WAC 173-26-020(40))	Primary water-enjoyment uses may include, but are not limited to, parks, piers and other improvements facilitating public access to the shorelines of the state; and general water-enjoyment uses may include, but are not limited to, restaurants (where views or other features allowing significant public access are provided), museums, aquariums, scientific/ecological reserves, and resorts/hotels (as part of mixed-use development or with significant public access or restoration components), and commercial/office as part of a mixed-use development.

Based on a review of County Assessor records and the current land use pattern, the current use categories that were considered most likely to meet the definition of water-oriented uses were selected as follows:

- Transportation, Communication and Utilities (water-dependent when a port or marina)
- Cultural, Entertainment, and Recreational (when a water-enjoyment use)
- Manufacturing (water-related when a use is dependent upon shipping)

In the rural portions of the County, much of the potential water-oriented uses are parks; open space; and cultural, entertainment, and recreational activities. More urban examples of water-oriented uses, including eating/drinking places and hotel/lodging uses, are found in the Cities and UGA portions of the County.

More discussion of water-oriented uses is found in Chapter 6, broken down by reaches.

Transportation and Utility Infrastructure

There are several County, City, state and federal highway road sections and railroad corridors in Walla Walla County that either parallel, cross or are otherwise located in existing or future shoreline jurisdiction. Road densities are highest in the eastern portion of the county near population centers. Active railroads include the Union Pacific Railroad which intersects much of the Snake and Columbia River shoreline jurisdiction, the BNSF Railway and the Palouse River and Coulee City Railroad. Utility infrastructure such as water, wastewater, electrical, communication, and other facilities are found throughout the County with a higher prevalence in populated areas of the County as well. More information about transportation and utility infrastructure by waterbody is found in Chapter 6.

Existing and Potential Public Access

Shoreline waterbodies in Walla Walla County are accessed at federal, state, City and County parks and trails, though there are gaps in the network, which are the subject of parks and recreation plans. Information about shoreline public access facilities and potential opportunities was obtained from the Port of Walla Walla County, County and City maps and plans, Washington State Parks, Washington Recreation and Conservation Office, U.S. Army Corps of Engineers, Department of Natural Resources and Umatilla National Forest.

Historical or Archaeological Sites

Historical and Archeological data were obtained from the WA Department of Archaeology and Historic Preservation. Data represents only known historical properties or places. Other significant sites may exist. Due to the wealth of cultural resources potentially present in areas long inhabited by human populations, the State of Washington Department of Archaeology and Historic Preservation often requires cultural resources assessments when development or activities are proposed that may affect archaeological or historic resources.

Archeological and culturally significant sites are not mapped in the shoreline inventory map folio but they are discussed where relevant in Chapter 6.

Future Land Use

Future land use analysis was based on County and City comprehensive plans, as available, provided by the Walla Walla Joint Community Development Agency, as well as County and City zoning. Future land use is discussed in detail, by waterbody in Chapter 6.

4.3 Summary of Shoreline Inventory Results

In order to assess shoreline conditions and ecological functions at a local scale, each shoreline waterbody's jurisdictional area was broken into discrete reaches. Appendix C expands upon the relevant required inventory elements discussed above, providing specific detail and data for each reach (see Section 5.1.1 below for description of reach delineation). Unless otherwise noted, the results reported in Appendix C consider only information available within the boundaries of shoreline jurisdiction of each reach.

5 ANALYSIS OF ECOLOGICAL FUNCTIONS

5.1 Approach, Rationale and Limitations of Functional Analysis

A GIS-based semi-quantitative method was developed to characterize the relative performance of relevant ecological processes and functions by shoreline reach, within the County and each City jurisdiction, as outlined in WAC 173-26-201(3)(d)(i). The assessment used the available information gathered as part of the shoreline inventory and applied standardized ranking criteria to provide a consistent methodological treatment among reaches (Table 5-4). Because watershed processes and the underlying geomorphic context are distinct between rivers, in some cases separate scoring criteria were developed for each river. Some criteria were not applicable for analyzing Bennington Lake functions and were therefore excluded from analysis of the lake reaches. These semi-quantitative results will ensure consistent and well-documented treatment of all reaches when assessing existing ecological conditions, yet allow for a qualitative evaluation of functions for data that are not easily summarized by GIS data alone. The results are intended to complement the inventory information in Appendix C and provide a comparison of watershed functions relative to other reaches in the County or City jurisdictions. Analysis scores and descriptions are accompanied by photographs taken during site visits or bird's eye view aerial images from Google Earth (Google 2014).

5.1.1 Reach Delineation

In order to assess shoreline functions at a local scale, each shoreline waterbody's jurisdictional area was broken into discrete reaches based on a review of maps and aerial photography. Land use (e.g., land use patterns, zoning, vegetation coverage, and shoreline modifications) was weighted heavily in determining reach break locations because the intensity and type of land use has affected and will continue to affect shoreline ecological conditions. Furthermore, functional analysis outcomes will be more relevant for future determination of appropriate shoreline environment designations if the reach breaks occur at potential transition points in environment designations (note: every attempt has been made to create reach breaks along parcel boundaries). Regardless, reaches have been created for informational purposes only and are not intended to represent regulatory boundaries. While reach scale analysis of ecological functions is one aspect of evaluating appropriate environment designations, several other inventory elements also play a significant role.

In addition to land use, physical drivers of shoreline processes were used to establish an overall framework for determining reach break locations. As noted throughout this report, ecological function scores at the reach level are intended to be indicators of function and not an absolute metric.

The following criteria in the following general order were used for determining reach break locations:

- City and urban growth area boundaries;
- Changes in land use;
- Changes in vegetation (coverage and type);
- Shoreline modifications (levees and dams);
- FEMA floodway/floodplain areas; and
- Significant wetland areas

In all of the above criteria (except the city/UGA boundaries), reach breaks were made where fairly significant changes were evident. For example, the presence of a couple of single-family residences along a stretch of undeveloped shoreline would not necessitate creation of a reach break to separate those two different uses.

The following is a complete list of the 50 reaches initially created for this effort. Each reach has been given a unique identifier to signify the waterbody name, reach number along that waterbody, and a general locator name for reference. The map of shoreline reaches includes color-coded waterbodies and the reach number (Map 25, Appendix B).

Table 5-1. Shoreline Reaches Used in Functional Analysis

Shoreline Reaches
Bennington Lake-1
Columbia River- 1, Highway 730 Columbia River- 2, Walla Walla Confluence Columbia River- 3, Primary Agriculture Columbia River- 4, Attalia UGA- Industrial Columbia River- 5, J Line, Casey and Curlew Ponds Columbia River- 6, Burbank RAC-Lake Wallula Columbia River- 7, Burbank Slough Columbia River- 8, Burbank Slough RAC
Mill Creek- 1, Garrett Mill Creek- 2, Levee Mill Creek- 3, Walla Walla UGA West Mill Creek- 4, Walla Walla Water Treatment Plant (Public Reserve) Mill Creek- 5, Walla Walla Commercial/Industrial

Shoreline Reaches
Mill Creek- 6, Walla Walla Mixed Use
Mill Creek- 7, Walla Walla Downtown-Underground Section
Mill Creek- 8, Walla Walla Downtown Flume
Mill Creek- 9, Walla Walla Residential
Mill Creek- 10, Walla Walla Public Reserve/Residential
Mill Creek- 11, Walla Walla UGA East
Mill Creek- 12, Diversion Dam
Mill Creek- 13, Rural Residential
Mill Creek- 14, Kooskooskie
Mill Creek- 15, SE County
Snake River- 1, Burbank RAC-Port of Walla Walla
Snake River- 2, Burbank RAC Residential/Public Reserve
Snake River- 3, Public Reserve- Lower Snake Islands
Snake River- 4, Public Reserve
Snake River- 5, Public Ownership
Snake River- 6, Lower Monumental
Snake River- 7, Northern County Primary Agriculture
Touchet River- 1, Touchet Rural Residential
Touchet River- 2, Primary Agriculture
Touchet River- 3, Primary Agriculture Hwy 124
Touchet River- 4, Prescott
Touchet River- 5, Waitsburg Treatment Plant
Touchet River- 6, Waitsburg Agriculture
Touchet River- 7, Waitsburg mixed residential
Touchet River- 8, East Waitsburg Rural
Touchet River- 9, East County
Walla Walla River- 1, Smith's Harbor
Walla Walla River- 2, Primary Agriculture
Walla Walla River- 3, Touchet Confluence-Ag/Residential
Walla Walla River- 4, Lowden
Walla Walla River- 5, Ag Residential
Walla Walla River- 6, Ag/Residential Riparian
Walla Walla River- 7, Rural Residential
Yellowhawk Creek- 1

5.1.2 Functions and Impairments

The analysis of reach functions was based on the four major function categories identified in the Department of Ecology's guidelines: hydrologic, hyporheic, shoreline vegetation, and habitat. The four primary functional categories were further broken down into relevant functions which were used to evaluate reach performance:

Table 5-2. Ecological processes and functions used to evaluate reaches

Ecological Process and Functions
1. Hydrologic Functions • Moderating erosion processes and the transport of water and sediment • Development and maintenance of instream habitat features (e.g., riffles, pools, and off-channel habitat) • Attenuating flow energy
2. Vegetative Functions • Provision of large woody debris (LWD) and organic matter • Filtering of upland inputs, including excess nutrients, fine sediment, and toxic substances • Slowing riverbank erosion; bank stabilization
3. Habitat Functions • Wetland and riparian habitat • Physical space (upland and aquatic, including migration corridors) and conditions for life history
4. Hyporheic Functions • Water and sediment storage, cool water refugia, and maintenance of base flows • Support of vegetation

The available information gathered County-wide in the Shoreline Inventory Map Folio (Appendix B) was used to determine the performance of these functions (High, Moderate, or Low). Metrics were developed based on best professional judgment related to known impacts of different parameters and the data available (Table 5-4). Rankings were developed for each function based on the distribution of conditions within the County or City for each river, so that each ranking provides a relative measure of functions compared to other reaches in the water body and local jurisdiction.

Table 5-3 provides a description of the significance of each function, and how each function may be affected by human alterations. It should be noted that alterations to watershed-wide processes (e.g., flow regulation) affect functions throughout all reaches of each river. Since the purpose of this analysis is to differentiate between levels of function and anthropogenic alterations, the effects of these watershed-wide impairments are addressed in Table 5-3, and not incorporated into the scoring of each reach.

Table 5-4 describes the metrics and scoring methodology for each function. Scoring of some functions is different between rivers, so that the range of scores for each river represents the range of relative functions of each reach compared to other reaches in the same river. For example, floodway area is present along portions of the Walla Walla River, Touchet River and Mill Creek, but is not present on the other waterbodies;

therefore, the scoring criteria for flow attenuation incorporates floodway data for the Walla Walla, Touchet and Mill Creek and uses floodplain data for the others.

Also, not all of the same functions are applicable to Bennington Lake that are applicable to the stream reaches. For example, development of in-stream features like riffles and pools does not occur in a lake environment. Likewise, hyporheic functions are generally dependent on directional flow, and therefore are less meaningful in lake environments. Consequently, metrics for evaluating Bennington Lake have been adapted to be more applicable to a lake shoreline and some criteria in Table 5-4 were not considered.

Scoring of functions was done separately for the reaches within each local jurisdiction and within each waterbody in order for the range of scores for reaches to represent the range of relative functions of each reach compared to other reaches in both the same river and within the same local jurisdiction. For example, the levees within the City of Walla Walla lower many of the functions of Mill Creek through the city. These reaches were scored and ranked relative to one another in order to represent a more accurate range of functions within the City's shorelines, and differentiate between varying levels of function despite the overall functional impairment due to the levees. In addition to the functional scoring, City reaches are also more qualitatively described under each relevant water body section below.

Table 5-3. Description of shoreline functions and common sources of human disturbance.

Hydrology	Vegetative	Habitat	Hyporheic
Functions			
Sediment Production Sediment transport is an integral process to building and maintaining instream habitat features. Gravel beds and sand bars help form diverse geomorphic conditions. Metered sediment delivery typically occurs through bank erosion, landslides, and bedload transport. Excessive fine sediment delivered to channels can suffocate salmonid eggs, inhibit emergence of fry from gravels, decrease feeding success, increase physiological stress, and through adsorption, may facilitate the transport and persistence of chemical contaminants. Alternatively, if banks are too stable in reaches without bedrock control, the erosive power of high flows may scour the bed of the river, causing channel incision and disconnecting the river from its floodplain. Development of Instream Habitat Features Channel form, including meander formation and floodplain development affects the distribution and dimensions of aquatic habitats, such as pools and riffles. Large woody debris (LWD) recruitment from mature tree cover influences	Shade Riparian vegetation helps maintain cool water temperatures through provision of shade and creation of a cool and humid microclimate over the stream. Given the width of the Columbia and Yakima Rivers and the type of riparian vegetation that grows along the banks, shading from vegetation has a limited potential to provide temperature refuge in any shoreline reaches in the County. Instead, thermal refugia in these rivers are primarily derived by hyporheic activity, groundwater inputs, and small tributaries (which can significantly benefit from riparian shading). Large Woody Debris/Organic Inputs Riparian vegetation provides a source of large woody debris recruitment, and provides organic matter which is important to the ecosystem in the form of leaves, branches, and terrestrial insects. Removing Excess Nutrients Dense riparian vegetation encourages infiltration of surface water. Nutrients and	Wetland/Riparian Habitats Continuous riparian vegetation along the length of a waterbody provides a dispersal corridor for animals using riparian habitats. Larger and wider riparian and wetland areas tend to have more complex vegetation communities and more habitat types. Wetlands adjacent to streams provide an important habitat niche for a variety of species, particularly amphibians. Physical Space for Life History Some areas support important or rare species assemblages or habitat features that require an elevated level of protection to ensure that these natural features are conserved. Many aquatic species, including some species of salmon, rely heavily on off–channel areas, for rearing. Riparian vegetated habitats are particularly important for breeding, foraging, and rearing of many terrestrial species.	Water storage, cool water refugia, and filtration Storage of peak flows is provided by floodplains, off channel areas and large wetland complexes; these features serve to reduce peak flows and contribute to summer low flows. Groundwater from shallow aquifers is often a substantial component of base flows, and groundwater seeps provide an important source of cool water refugia. Storage of peak flows is provided by local topography. Within shallow alluvial soils adjacent to steams, nutrients and toxic compounds may be filtered or removed by uptake, especially in floodplain areas. Support of Vegetation Hyporheic flow helps support vegetated riparian floodways and floodplains.

Hydrology	Vegetative	Habitat	Hyporheic
stream channel morphology and habitat complexity. Accumulations of LWD affect bank stability, scour, bar formation, and may also induce rapid channel adjustments and assists in pool formation. Mid-channel islands and off-channel habitats provide important high-flow refugia for fish and wildlife. Wave and Flow Attenuation Floodway areas and riverine wetlands provide a transition between upland and riverine habitats. Vegetated floodways help slow and disperse flood flows. The extent to which local conditions affect flow is related to the position of a reach within a watershed and the size of the floodplain or wetland area relative to watershed size.	contaminants in subsurface water are filtered out of the soil and taken up by the roots of plants. Shoreline Stabilization The root structure of woody vegetation stabilizes shoreline soils and prevents excessive erosion.		
Watershed-wide Alterations			
Dam regulation on the Columbia, Snake and Mill Creek affects the timing, duration, and frequency of flood events, as well as sediment transport. The dams on the Lower Snake and Columbia Rivers impound water, creating shallow reservoirs that typically fill the width of the steep-sided canyons. Dredging of the Columbia River has	On the Columbia, Snake and Mill Creek, dam regulation, channelization, and armoring limit floodplain connectivity, which helps support the establishment of riparian vegetation. Over time, as flood events are reduced in magnitude and frequency, the area of riparian vegetation is reduced.	Hydrologic alteration from dams interrupts natural habitat forming processes, which create diversity in channel form and suitable instream habitat function. Periodic dredging of depositional areas in the Columbia River limits the development of instream habitat features.	Dam regulation limits the frequency and intensity of flooding events, which limits the recharge capacity of the aquifer. Irrigation-induced groundwater flows and agricultural return flows now discharge to the river to provide cool water refugia.

Hydrology	Vegetative	Habitat	Hyporheic
also greatly simplified the channel form and limited geomorphic diversity. Irrigated agriculture occurs throughout the County and can effect natural hydrologic processes. Irrigation water is drawn from groundwater and late spring and summer surface flow. Irrigation returns have substantially replaced natural groundwater recharge.	LWD recruitment from within Walla Walla County was likely always limited given the climate and type of riparian and upland vegetation naturally occurring in the County. Instead, LWD was transported from upstream reaches. Noxious weeds along the Touchet and Walla Walla Rivers threaten the native plant communities which can affect bank stability, as well as floodplain connectivity.		
Localized Alterations			
Armored shorelines prevent natural erosion and sediment delivery processes. Shoreline armoring can limit floodway interactions, accelerate streamflow along the bank, and contributing to erosion of adjacent properties. Loss of mature, native vegetation and wetlands affects the timing, rate, magnitude, and duration of stream flows. An increase in impervious surfaces results in increased frequency and intensity of flooding. Changes in flow volume or frequency can alter channel morphology and the sediment balance of the stream.	Clearing and grading for development often results in the removal of significant vegetation. Impervious surfaces related to roadways, driveways and parking areas tend to produce hydrocarbon pollutants and heavy metals. Depending on management activities, even pervious surfaces such as lawns and pastures can substantially increase nutrients from fertilizers and pollutants and toxins through herbicides and pesticides. Armored shorelines can isolate the river from potential sources of organic matter and eliminate filtration potential.	Historic draining, ditching, and fill of wetlands for agriculture and development have reduced the availability of suitable habitat for aquatic and terrestrial species. In water structures interrupt the longitudinal flow of sediment and alter habitat associations.	Impervious surfaces reduce infiltration, increasing surface flows. The net result is a reduction in shallow groundwater and hyporheic flows capable of maintaining summer low flows in streams and rivers. Levees that limit channel migration and floodplain area also restrict hyporheic activity.

Hydrology	Vegetative	Habitat	Hyporheic
In addition to watershed scale effects, irrigation withdrawals can have localized effects on stream flow. The effect of withdrawals on stream flow may depend on the withdrawal rate, as well as the local groundwater interchange (i.e. if the reach is a gaining or losing reach).			

Table 5-4. Functional score ranking for SMA waterbodies[1] by indicator metric.

Process/Function		High	Moderate	Low
Hydrologic	Moderation of sediment transport	• No armoring or dams present within the reach	• Steep slopes present, but not developed AND • Limited armoring present	• Steep slopes present with development OR • Majority of the reach is armored
	Development/ maintenance of in-stream habitat features	Backwater areas, islands, and wetlands occupy >30% of the reach	• Backwater areas, islands, and wetlands occasionally present OR • Off-channel habitats are isolated from the mainstem channel by armoring or causeways	• No backwater areas, islands, or wetlands OR • Off-channel habitats are significantly altered (i.e. dredged or armored)
	Attenuation of flow energy	• Majority of the reach is not armored or protected by levees AND • Large wetlands or backwaters are present AND • Floodway[2] >50% of area	• Wetlands or backwater areas are occasionally present AND • Majority of the reach is not armored or protected by levees AND • Floodplain[2] >20% OR • Floodway 20-50%	• Levees present or majority of the reach is armored OR • No wetlands or backwater areas present OR • Floodplain area <20% of total area or lacks vegetation OR • Floodway <20% of total area or lacks vegetation
Vegetative	LWD and organic matter recruitment	• Forest, shrub, or wetland vegetation >75% of area within immediate proximity of shoreline AND • No armoring or structures separate vegetation from the water's edge.	• Forest, shrub, or wetland vegetation 50-75% of area within immediate proximity of shoreline OR • A portion of the vegetation isolated from the water's edge by armoring or other structures	• Forest, shrub, or wetland vegetation <50% of area within immediate proximity of shoreline OR • Vegetation is separated from the shoreline by armoring and other structures
	Filtration of upland inputs	A broad band of dense vegetation separates uplands from the river	A narrow band of dense vegetation or a broad band of sparse vegetation separates uplands from the river	• No vegetation along the shoreline OR • A narrow band of sparse vegetation separates uplands from the river
	Bank stabilization	Riparian trees and shrubs stabilize the banks in the majority of the reach	• Riparian trees and shrubs are sparsely present along the shoreline OR • A portion of the shoreline is armored	• The majority of the reach is armored

Process/Function		High	Moderate	Low
Habitat	Wetland/ riparian habitat	• Wetland area >30% of total area OR • A broad band of dense riparian vegetation is present	• Wetland area 15-30% of total area OR • Limited areas of dense riparian vegetation are present	• Wetland area <15% of total area AND • Dense riparian vegetation is absent
	Space and conditions supporting fish and wildlife, including PHS species	• PHS region> 50% of area OR • Significant wetland, riparian, or unique habitat features are present and corridors between habitats are free from roads and other development	• 2 or more PHS regions each >25% of area OR • Significant wetland, riparian, or unique habitat features are present within the reach, but the corridors between habitats are impaired by development	• wetland, riparian, or unique habitat features are absent or significantly degraded
Hyporheic	Water storage and filtration	• Riverine wetlands are present AND • Armoring does not isolate the wetland from the mainstem channel	• Banks of the river are moderately sloped AND • The majority of the banks are not armored	• Banks slope steeply up from the River OR • The majority of the banks are armored
	Support of vegetation	• Large, riverine wetlands occur within the reach • OR • Alluvial soils comprise over 75% of the reach	• River banks support moderate density of scrub or forested vegetation AND • Alluvial soils comprise 10-75% of the reach	• Banks of the river support little, if any, vegetation OR • Alluvial soils comprise under 10% of the reach

1. The high, moderate, low ranking criteria depicted here were used for all waterbodies with the following exceptions:
   a. Bennington Lake: Hyporheic functions were not evaluated and different criteria were used for the analysis of hydrologic function as those processes/functions differ, or are not present in a lacustrine environment (see Section 5.2.7).
   b. Mill Creek in the City of Walla Walla: The same functions and processes were used to evaluate city reaches, however criteria were applied somewhat differently for H, M and L scores in consideration of the high level of modification present in the system overall. For example, more lenient definitions of “broad” and "narrow” were applied and best professional judgment was used rather than numeric thresholds, to allow for more meaningful differentiation between the reach scores, relative to one another (see Section 5.2.6).
2. Floodway area is present along portions of the Walla Walla River, Touchet River and Mill Creek, but is not present on the other waterbodies; therefore, the scoring criteria for flow attenuation incorporates floodway data for the Walla Walla, Touchet and Mill Creek and uses floodplain data for the others.

5.1.3 Limitations

This evaluation was limited by the quality and availability of inventory data. Therefore, limitations presented in Sections 4.2.1 also apply to this evaluation.

In evaluating shoreline functions, the area of shoreline impacts and conditions assessed was generally limited to the area of shoreline jurisdiction. In many cases, shoreline impacts may occur at a site due to ecological and geomorphological processes that are disturbed at a remote site upstream, further inland, or up-current. This evaluation approach may not identify all of the functional responses occurring as a result of impacts to nearby or remote areas.

The approach was limited to an evaluation of shoreline ecological potential, and it did not integrate this potential with the opportunity to perform a given function based on site-specific conditions. For example, the analysis assessed the ability of a shoreline to store water, but it did not consider the frequency of flooding downstream and the corresponding significance of such a function.

5.2 Results of Functional Analysis

The following sections summarize the results of the ecological functional analysis for each shoreline waterbody. A brief overview of each waterbody is given, followed by a one page summary of the overall main functions and impacts and a detailed breakdown of the functional scores by reach.

5.2.1 Snake River

Overview

The Snake River flows along the majority of the northwestern border of Walla Walla County. It is an important transportation corridor and has significant barge traffic on the river and train traffic along the shoreline. The majority of the cargo is wood and coal. A 14-foot navigational channel is authorized to be maintained through dredging throughout the river.

For the purposes of this report, the shoreline jurisdiction area has been divided into seven reaches, numbered sequentially upstream. Conditions along the upper reaches (4-7) are impacted from the Union Pacific Railroad which parallels the shoreline. Two dams, Ice Harbor and Lower Monumental, are found in Reaches 3 and 6, respectively. The channel in most areas has steeply sloped banks or is within steep-sided canyons with limited vegetation. Compared to the upper reaches, reaches along the lower Snake (1-3) have areas with less armoring, more wetlands, islands and shoreline vegetation;

however, more residential development also occurs near the shoreline in the lower Snake reaches, particularly in the shoreline areas around Burbank (Reach 2). Some industrial development is also present at the Port of Walla Walla in Reach 1.

The following page provides a summary of the main functions and impacts in the Snake River shoreline jurisdiction for each of the four ecological processes categories identified in Table 5-2.

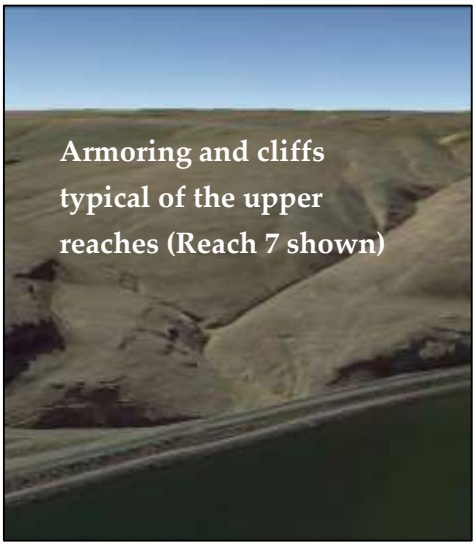
Snake River

Process	Function	Notes
Hydrologic	Moderation of sediment transport	Armoring along the majority of the shoreline (Reaches 7, 6, 5, part of 4 and 1) limits flow attenuation and instream habitat diversity. Ice Harbor and Lower Monumental Dams (in Reaches 3 and 6) impound water, creating shallow reservoirs that typically fill the width of the steep-sided canyons. Dredging occurs in all reaches to maintain a 14-foot navigational channel.
	Development and maintenance of in-stream habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	A railroad and associated armoring runs along the shoreline starting in Reach 4, and continues through Reaches 5-7. Shrub steppe vegetation is located upland of the railroad prism, limiting its potential shoreline functions. Reaches 2, 3 and part of 1 have more riparian vegetation, including wetland present.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	The railroad running parallel to the shoreline (predominantly in Reaches 1-3) limits wildlife dispersal opportunities. Riparian vegetation is also limited along these reaches and no wetlands are present. However, shrub steppe vegetation and bluffs provide upland habitat value. PHS regions, including waterfowl concentration areas, are mapped over portions of Reaches 4-7. Wetland habitat is present in Reaches 1-3. Anadromous fish use is documented throughout the river.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	Hyporheic functions are limited by armoring and/or natural cliffs throughout most of the shoreline (majority of all reaches excluding 2 and 3).
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions:

Dam operations (Reach 3, 6) retain sediment and result in seasonal and daily fluctuations in water levels. The railroad prism and associated armoring limits shoreline functions and natural cliffs limit vegetative and hyporheic functions throughout the majority of the reaches. However, cliffs and bluffs provide unique upland habitats.

Select Reach Photos *Aerial images source: Google Earth 2014*



Reach-Based Existing Ecological Functions

Table 5-5, below, provides a summary of functional ranking by reach in the Snake River.

Table 5-5. Functional scoring by reach on the Snake River

Relative ranking order from highest to lowest function based on mean reach scores (L= Low function, M=Medium function, H= High function).

Reach Number/ Name		Rank	Hydrologic			Vegetative			Habitat		Hyporheic	
			Moderation of sediment transport	In-stream habitat features	Attenuating flow energy	LWD and organic matter recruitment	Filtration of upland inputs	Bank stabilization	Wetland/riparian habitat	Space and conditions supporting wildlife	Water storage and filtration	Support of vegetation
3	Public Reserve- Lower Snake Islands	1	M	H	M	M	M	H	M	M	M	M
2	Burbank RAC- Residential/Public Reserve	2	M	M	M	L	M	H	M	L	M	M
1	Burbank RAC- Port of Walla Walla	3	L	M	M	L	L	M	M	L	L	M
4	Public Reserve	4	L	L	L	L	M	L	L	H	L	L
6	Lower Monumental	5	L	L	L	L	L	L	L	H	L	L
7	Northern County Primary Agriculture	5	L	L	L	L	L	L	L	H	L	L
5	Public Ownership	5	L	L	L	L	L	L	L	H	L	L

Restoration Opportunities

The Lower Snake Mainstem Subbasin Plan identified management actions relating to aquatic and terrestrial habitat (Pomeroy Conservation District 2004). Plan actions for terrestrial habitats address shrub-steppe, Ponderosa pine, riparian riverine, and grassland habitats. The lower approximately 20 miles of the mainstem Snake River are identified as Class 1 conservation priority, meaning that they include key habitats mostly under private ownership (high risk potential) (Pomeroy Conservation District 2004). Compared to the Snake River's upstream drainage area, the Lower Snake Subbasin is relatively arid and only a small portion of the mainstem flow in the Lower Snake is derived from tributaries. Nevertheless, Lower Snake Mainstem Subbasin Plan actions relating to aquatic habitat are directed at improving conditions in tributaries to the mainstem (occurring upstream of Walla Walla County) and priority terrestrial habitats within the subbasin. This may be in part due to a limited understanding of the

significance of habitat conditions in the mainstem. The Snake River Salmon Recovery Board (2011) identified a need to assess nearshore habitat and cold water refugia in the mainstem and to explore opportunities for, and potential benefits from, restoration and protection of these areas.

5.2.2 Columbia River

Overview

The Columbia River completes Walla Walla County's western border from the confluence with the Snake River to the Oregon border. For the purposes of this report, the shoreline jurisdiction area has been divided into eight reaches, numbered sequentially upstream. The conditions along the Columbia River within shoreline jurisdiction vary from armored roadbed and railroad (Reaches 1, 3 and 4) to extensive wetland habitat (Reaches 2 and 5-8) and public reserve (Reaches 5-8). Shoreline jurisdiction reaches are mostly undeveloped other than transportation infrastructure and include Burbank Slough and extensive off-channel ponds and wetlands, as well as a portion of the McNary National Wildlife Refuge (see Section 3.4.2) extending from the confluence of the Snake River to the mouth of the Walla Walla River, and downstream into Oregon. Some commercial/industrial development is located in Attalia (Reach 4), and the Wallula Gap Industrial Park-Shipping Terminal in Reach 1.

Reach 6, just south of the confluence of the Columbia and Snake Rivers, near Burbank, includes extensive area mapped as wetland by NWI. The northern portion of this reach includes land owned by the Port of Walla Walla, which is planned for development as part of the Burbank Industrial Park. As part of the planning process for the industrial park, the Port had a wetland delineation of this area conducted in 2010 (Anderson Perry & Associates 2010). The results of this study, which are included in the wetland maps in Appendix B, depict a slightly smaller wetland area than is shown in the NWI. Site-scale investigation is always needed to conclusively include or exclude potential wetland areas and it should be noted that actual wetland conditions that may or may not be found on a site will determine shoreline jurisdiction (as a potential shoreline-associated wetland) on a site-specific basis.

The following page provides a summary of the main functions and impacts in the Columbia River shoreline jurisdiction for each of the four ecological processes categories identified in Table 5-2.

Columbia River

Process	Function	Notes
Hydrologic	Moderation of sediment transport	At least some armoring is present in all of the reaches (particularly in Reaches 1, 3 and 4) that limits flow attenuation and instream habitat diversity. Dam regulation and dredging throughout the Columbia impact natural hydrologic processes. However, extensive backwater areas and islands (Reaches 5, 6, 7, and 8) allow for sediment deposition and off-channel habitat.
	Development and maintenance of in-stream habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	In Reaches 1, 3 and 4, vegetation is mostly located upland of the railroad prism, limiting its potential shoreline functions. Extensive wetland and riparian vegetation is present in Reaches 5-8. However, Highway 12 and a railroad slightly lower vegetative scores in Reach 5.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	The railroad limits wildlife dispersal opportunities and riparian vegetation is limited along several of the reaches (1, 3, and 4). However, shrub steppe vegetation and bluffs provide upland habitat value and high habitat functions in wetlands and off-channel habitats are present in Reaches 2 and 6 and especially around Burbank Slough (Reaches 7, 8) and the ponds in Reach 5. Anadromous fish use is documented throughout the river.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	Hyporheic functions are limited by armoring in Reaches 1, 3 and 4, however, large riverine wetlands and high percentages of alluvial soils are present in Reaches 3-7 which maintain water and support shoreline vegetation.
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions:

Function varies greatly between reaches. Generally functions are limited by armoring along most of the river. Numerous overwater structures are also present. However, extensive backwater habitat and wetland areas greatly increase functions around the Burbank Slough area. Bluffs also provide unique upland habitat.

Select Reach Photos *Aerial images source: Google Earth 2014*

Typical condition of Reach 3, along railroad with adjacent agricultural uses

Industrial uses near Attalia (Reach 4)

Armoring and cliffs typical of Reach 1 along Highway 730

Extensive wetland, islands and backwater areas in Reaches 5 and 6

Reach-Based Existing Ecological Functions

Table 5-6, below, provides a summary of functional ranking by reach in the Columbia River.

Table 5-6. Functional scoring by reach on the Columbia River

Relative ranking order from highest to lowest function based on mean reach scores (L= Low function, M=Medium function, H= High function).

Reach Number/ Name		Rank	Hydrologic			Vegetative			Habitat		Hyporheic	
			Moderation of sediment transport	In-stream habitat features	Attenuating flow energy	LWD and organic matter recruitment	Filtration of upland inputs	Bank stabilization	Wetland/riparian habitat	Space and conditions supporting wildlife	Water storage and filtration	Support of vegetation
7	Burbank Slough	1	M	H	H	H	H	H	H	H	H	H
8	Burbank Slough RAC	2	M	H	H	H	M	H	H	H	H	H
2	Walla Walla Confluence	3	M	H	H	H	H	H	H	H	H	H
6	Burbank RAC- Lake Wallula	4	M	H	H	H	H	M	H	H	H	H
5	J Line, Casey and Curlew Ponds	5	M	H	H	M	M	M	H	H	H	H
4	Attalia UGA-Industrial	6	L	M	L	L	M	M	M	M	L	H
3	Primary Agriculture	7	L	L	L	L	L	L	M	M	L	H
1	Highway 730	8	L	L	L	L	L	L	L	L	L	L

Restoration Opportunities

As noted in Section 5.2.1, the Snake River Salmon Recovery Board (2011) identified a need to assess nearshore habitat and cold water refugia in the mainstem and to explore opportunities for, and potential benefits from, restoration and protection of these areas. The Mid-Columbia Fisheries Enhancement Group recently completed an inventory of potential restoration opportunities on the Columbia River Shoreline on the right bank (looking downstream) of the Columbia (Interfluve 2013). Although the identified projects are on the opposite bank from Walla Walla County, the same general habitat strategies are expected to apply. The key strategies for habitat restoration identified within the Columbia River mainstem in this plan involved:

- Mainstem Shorelines:
    - Creation of shallow nearshore habitat, and

    - Enhancement of shoreline complexity and vegetation.

- Backwaters
    - Improved fish passage and hydrologic connectivity
    - Enhancement of backwater form and function
- Tributary Confluences
    - Improved tributary fish passage and hydrologic connectivity
    - Restoration of tributary delta form and function

Within the Columbia River mainstem, dam operations and management of the McNary National Wildlife Refuge are two of the key features affecting shoreline functions. These issues are discussed further below.

Dam operations

Current hydropower programs and operations are engaged in activities to minimize impacts of flow regulation on the ecological processes of the Columbia River. These actions are generally the result of obligations under the Endangered Species Act (Section 7 consultations, Section 10 Habitat Conservation Plans (HCPs)) or FERC relicensing.

- The following actions are identified by NMFS (2009) as significant actions to minimize impacts of mainstem dams on the hydrology, habitat, and water quality of the Columbia River: Modify Columbia and Snake River dams to maximize juvenile and adult fish survival.
- Implement spill and juvenile transportation improvements at Columbia and Snake River dams.
- Operate and maintain facilities at Corps mainstem projects to maintain biological performance.
- Implement piscivorous predation control measures to increase survival of juvenile salmonids in the lower Snake and Columbia rivers.
- Implement avian predation control measures to increase survival of juvenile salmonids in the lower Snake and Columbia Rivers.
- Implement marine mammal control measures to increase survival of adult salmonids at Bonneville Dam.
- Provide information needed to support planning and adaptive management and demonstrate accountability related to the implementation of FCRPS [Federal Columbia River Power System] ESA hydropower actions for all ESUs (i.e.,

implement research, monitoring, and evaluation programs for hydropower actions and predator control actions).

McNary National Wildlife Refuge

Established in 1956, the McNary NWR was created to replace wildlife habitat lost to construction of the McNary Dam downstream. The area consists of 15,000 acres of sloughs, ponds, streams and islands.

Seasonal wetlands are managed to promote diverse wetland plant growth. Upland areas are managed with prescribed burning, removal of exotic weed species, and planting of native grasses. Native willows and cottonwoods are planted in riparian areas. Approximately 700 acres of refuge lands are managed in agriculture specifically to provide waterfowl with winter forage opportunities.

5.2.3 Walla Walla River

Overview

The Walla Walla River flows into Walla Walla County from Oregon just south of College Place, then flows east until it joins the Columbia north of the Wallula Gap. For the purposes of this report, the shoreline jurisdiction area has been divided into seven reaches, numbered sequentially upstream. Shoreline conditions are moderate to high throughout all the reaches due to largely unaltered banks, floodway and floodplain connectivity, riparian vegetation and channel complexity. Summer steelhead and Spring Chinook are documented throughout all reaches, as well as bull trout in Reaches 5 and 6 (WDFW Salmonscape 2014). Stray Fall Chinook salmon and coho salmon may occasionally be present in the lowest reaches. It should be noted that there are other ongoing studies of the conditions on the Walla Walla River independent of this analysis report. Much of the research focuses specifically on fish habitat. The results of such studies may not align exactly with the functional analysis results presented here as the criteria and scoring thresholds are likely different, given the different purposes of the studies.

Highest functions are found in the Smith's Harbor reach (Reach 1) where extensive wetland and backwater areas are present. Reaches further upstream have some impact from residential development and agricultural use. Stream banks and the immediate shoreline are generally well vegetated. Little armoring is present and the channel has many meanders with large areas of wetland in all reaches. Large areas of floodplain are located in Reaches 1 and 2 and floodway is mapped in Reaches 3-7. Burlingame Dam is located in Reach 6.

The following page provides a summary of the main functions and impacts in the Walla Walla River shoreline jurisdiction for each of the four ecological processes categories identified in Table 5-2. Below the summary page, a detailed table of the functional scores for each reach is provided.

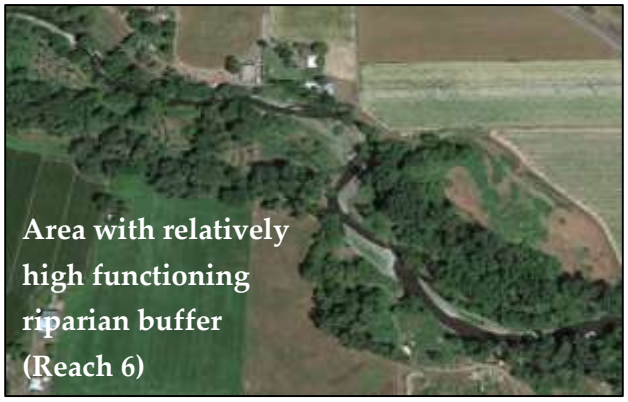
Walla Walla River

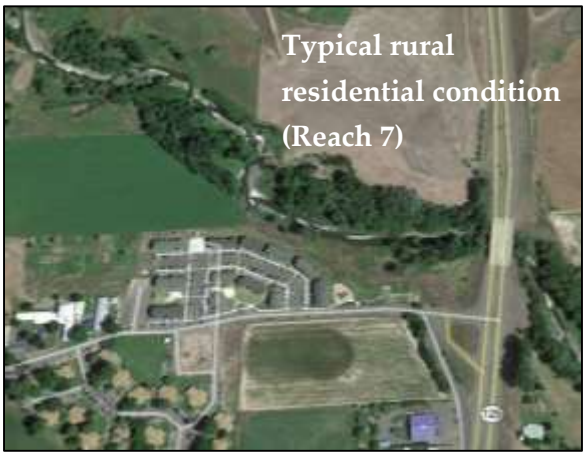
Process	Function	Notes
Hydrologic	Moderation of sediment transport	Moderate to high hydrologic function overall- Little armoring is present and the majority of the shoreline area is within the active floodplain and/or floodway. Floodway is greater than 60% of Reaches 3, 6 and 7. Vegetated riparian areas, including wetlands and backwater areas help slow and disperse flood flows. The dam lowers the sediment transport score for Reach 6.
	Development and maintenance of in-stream habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	Moderate vegetation function overall- The shoreline includes several areas of forested and scrub-shrub wetlands. Riparian forested and scrub-shrub vegetation provides filtration and stabilization functions. These are highest in the Smith's Harbor area (Reach 1) and lower through the rest of the reaches where the band of vegetation is more narrow, or broad but sparse.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	Moderate to high wildlife function overall- PHS regions are mapped throughout extensive portions of all reaches. Riparian vegetation separates the agriculture fields and associated development from the river in most places. Anadromous fish species (Summer steelhead, Spring Chinook) are documented using the channel.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	High hyporheic function due to extensive presence of alluvial soils that store water and support vegetation within the shoreline area. A high percentage of wetland area is also present, particularly in Reaches 1 and 4.
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions:

Agricultural uses are the primary modification along the Walla Walla River. However, areas of wetland, backwater habitat and a riparian buffer are still present along some portion of most of the reaches.

Select Reach Photos *Aerial images source: Google Earth 2014*





Reach-Based Existing Ecological Functions

Table 5-7, below, provides a summary of functional ranking by reach in the Walla Walla River.

Table 5-7. Functional scoring by reach on the Walla Walla River

Relative ranking order from highest to lowest function based on mean reach scores (L= Low function, M=Medium function, H= High function).

Reach Number/ Name		Rank	Hydrologic			Vegetative			Habitat		Hyporheic	
			Moderation of sediment transport	In-stream habitat features	Attenuating flow energy	LWD and organic matter recruitment	Filtration of upland inputs	Bank stabilization	Wetland/riparian habitat	Space and conditions supporting wildlife	Water storage and filtration	Support of vegetation
1	Smith's Harbor	1	H	H	M	H	H	H	H	H	H	H
6	Agriculture/Residential Riparian	2	M	H	H	M	M	H	H	H	H	H
3	Touchet Confluence-Agriculture/Residential	3	H	M	H	M	M	M	M	H	H	H
4	Lowden	3	H	H	M	M	M	M	H	H	H	H
2	Primary Agriculture	4	H	H	M	M	M	M	M	H	H	H
5	Agriculture/Residential	4	H	H	M	M	M	M	M	H	H	H
7	Rural Residential	4	H	M	H	M	M	M	M	H	H	H

Restoration Opportunities

A priority restoration reach identified in the Snake River Salmon Recovery Plan (Snake River Salmon Recovery Board 2011) begins at the mouth of Dry Creek and continues up to the Washington state line (Reaches 5, 6, 7 and a portion of 4). Key limiting factors and objectives noted for the priority restoration reach are identified in order of importance below:

1. Increase Stream Flow
2. Temperature: not more than 4 days above 72ºF
3. Large Woody Debris: > 1 piece per channel width
4. Embeddedness: less than 10% embeddedness
5. Riparian Function: 40 to 90% of maximum

6. Channel Confinement: reduce to 40% to 60% of stream length

Project- and program- specific opportunities are identified in the Snake River Salmon Recovery Board's 3-Year Work Plan (Snake River Salmon Recovery Board 2012) and include projects sponsored by a number or organizations including Walla Walla Watershed Management Partnership, Columbia Conservation District and Walla Walla County Conservation District, Gardena Farms Irrigation District #13, Walla Walla Basin Watershed Council, Department of Ecology, Confederated Tribes of the Umatilla Indian Reservation, Tri-State Steelheaders, and WDFW.

5.2.4 Touchet River

Overview

The Touchet River flows through the middle of Walla Walla County. It enters from Columbia County and flows east through the Cities of Waitsburg and Prescott before turning south and eventually joining the Walla Walla River in the southwest portion of the County, just southwest of unincorporated Touchet. For analysis purposes four reaches were delineated on the Touchet River within the unincorporated County (Reaches 1, 2, 3 and 9), four within the City of Waitsburg (Reaches 5, 6, 7 and 8) and one within the City of Prescott (Reach 4).

Functions are generally moderate to high throughout all reaches. Presence of anadromous fish species is documented throughout the river including Spring Chinook and Summer Steelhead, as well as presumed presence of bull trout in Reaches 3-9 (WDFW Salmonscape, 2014). The greatest functional impairments are found in the agricultural areas of Reaches 2, 3 and 6 where shoreline vegetation is lacking. Water quality in portions of the Touchet River is impaired, most commonly by pH (Reaches 1, 2, 3 and 7). Category 4a listings for temperature, dissolved oxygen and bacteria are also present for several reaches and Reach 1 has a Category 5 listing for turbidity. The city of Prescott is entirely on a septic system. The water downstream of Prescott has a 4a listing for bacteria.

A levee is present along a portion of Reaches 3 and 9 and through the majority of Waitsburg (Reaches 5-7). In 1996 a significant flood event occurred along the Touchet River in this area. Reports from the flooding indicate that in extreme flood events the old Mill Race north of Waitsburg can act like floodway. Because of this, portions of Reach 3 are considered a high priority for protection and restoration to increase flood control function. The City of Waitsburg has indicated that vegetation along the levee within City limits has been removed due to the Corps' maintenance requirements.

A discussion of shoreline conditions follows for the reaches in each of the local jurisdictions. The following page provides a summary of the main functions and impacts in Reaches 1, 2, 3,

and 9, which excludes the reaches within the City of Waitsburg. A separate summary is provided for the City of Waitsburg Reaches 5-8. Reach 4 within the City of Prescott is also described separately.

Below the summary pages, a detailed table of the functional scores for each reach is provided. Separate tables are provided for the reaches in each local jurisdiction so that they may be ranked relative to the other reaches within the same jurisdiction.

Touchet River–excluding City of Waitsburg reaches

Process	Function	Notes
Hydrologic	Moderation of sediment transport	Moderate to high hydrologic function is present overall. A small area of levee is present in Reaches 3 and 9, and Hofer Dam is located in Reach 2. Floodway is present along Reaches 1, 3 and 9. Several overwater structures are also present. Wetlands, meanders and backwater areas are present in Reach 3, with some other wetlands in Reaches 1 and 9.
	Development and maintenance of in-stream habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	Moderate vegetation function is present. Riparian vegetation is generally present separating the channel from uplands and stabilizing banks, though vegetation is very narrow in many areas, particularly in Reach 2. The most riparian vegetation is located along the slope on the south side of Reach 7.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	Overall, moderate to high habitat functions are present. PHS regions are mapped throughout a high percentage of all the reaches, as well as anadromous fish use. Some off-channel habitat areas are present in Reaches 2, 3 and 4.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	High hyporheic functions are present due to a high percentage of alluvial soils along the entire Touchet River which help store water and support vegetation within the shoreline area.
	Support of vegetation	

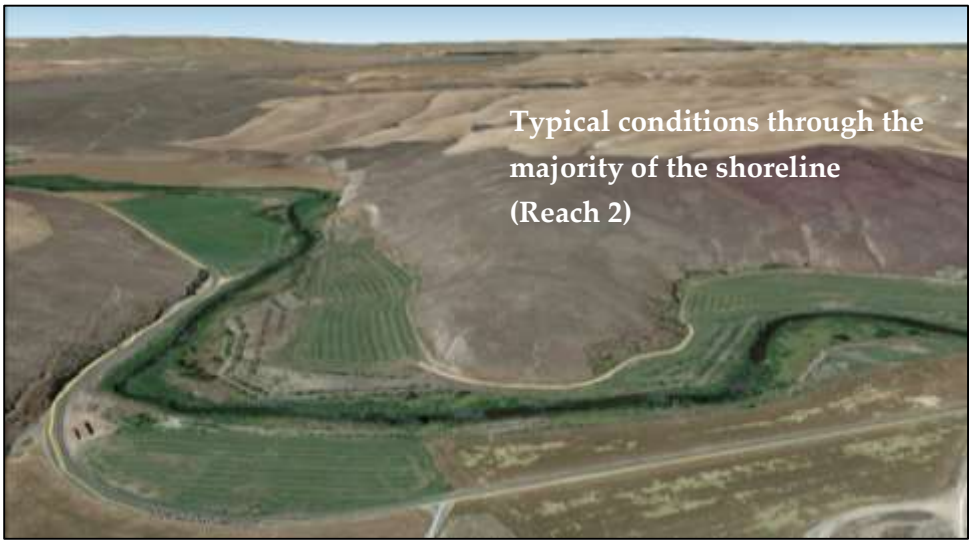
Key Environmental or Land Use Factors Affecting Processes/Functions:

Agricultural uses and loss of riparian vegetation are the primary modifications along the Touchet River.

Select Reach Photos *Aerial images source: Google Earth 2014*

Channel detail near Touchet

Denser woody riparian vegetation in Reach 3 near Hwy 124


Typical conditions through the majority of the shoreline (Reach 2)

Rural Residential shorelines in Reach 1

Reach 9 near eastern county border

Unincorporated County

Reach-Based Existing Ecological Functions

Table 5-8, below, provides a summary of functional ranking by unincorporated county reach in the Touchet River.

Table 5-8. Functional scoring by unincorporated county reach on the Touchet River

Relative ranking order from highest to lowest function based on mean reach scores (L= Low function, M=Medium function, H= High function).

Reach Number/ Name		Rank	Hydrologic			Vegetative			Habitat		Hyporheic	
			Moderation of sediment transport	In-stream habitat features	Attenuating flow energy	LWD and organic matter recruitment	Filtration of upland inputs	Bank stabilization	Wetland/riparian habitat	Space and conditions supporting wildlife	Water storage and filtration	Support of vegetation
1	Touchet Rural Residential	1	H	M	H	M	M	M	M	H	H	H
3	Primary Agriculture, Hwy 124	1	M	H	M	M	M	M	H	H	H	H
9	East County	2	M	M	M	M	M	H	M	H	H	H
2	Primary Agriculture	3	M	M	M	M	L	M	M	H	H	H

Restoration Opportunities

The Touchet River major spawning area and priority protection reach extends upstream from the Highway 125 Bridge to the confluence of Coppei Creek (within Reach 3). Key limiting factors and objectives noted in the Snake River Salmon Recovery Plan (Snake River Salmon Recovery Board 2011) for the priority restoration reach are identified in order of importance below:

1. Embeddedness: less than 10% embeddedness
2. Temperature: not more than 4 days above 72ºF
3. Large Woody Debris: > 1 piece per channel width
4. Channel Confinement: reduce to 40% to 60% of stream length

Project- and program- specific opportunities identified in the Snake River Salmon Recovery Board's 3-Year Work Plan (Snake River Salmon Recovery Board 2012) include projects to control sediment, enhance and protect riparian vegetation, restore floodplain, improve fish passage, and increase low flows. Project sponsors include the Tri-State Steelheaders, Walla Walla Conservation District, Walla Walla Watershed Management Partnership and WDFW.

City of Prescott

Portions of five parcels (3.5 acres total) within the City of Prescott lie within Touchet River shoreline jurisdiction (Reach 4), one in the southwest tip of the city and the others along the southeast border. For analysis purposes these areas were included as one reach. The shoreline at the very southwest tip of Prescott's city limits is fairly unaltered with forested and scrub/shrub vegetation, backwater and extensive wetland areas. While shoreline functions along the parcels at the very southeast of the city limits are more modified from agricultural activities and vegetation clearing; however, some unique backwater habitat is still present. The entire reach is mapped as floodplain and a priority habitat region for two species - Northwest White-tailed Deer and Ring-necked Pheasant. Over half is potentially associated wetland. Presence of Spring Chinook and Summer Steelhead is documented, as well as presumed presence of bull trout.

Reach-Based Existing Ecological Functions

Table 5-9, below, provides a summary of functional ratings for Reach 4 of the Touchet River within the City of Prescott.

Table 5-9. Functional scoring for the reach of the Touchet River within the City of Prescott

Reach Number/ Name		Rank	Hydrologic			Vegetative			Habitat		Hyporheic	
			Moderation of sediment transport	In-stream habitat features	Attenuating flow energy	LWD and organic matter recruitment	Filtration of upland inputs	Bank stabilization	Wetland/riparian habitat	Space and conditions supporting wildlife	Water storage and filtration	Support of vegetation
4	Prescott	NA	H	H	H	H	M	H	H	H	H	H

L= Low function, M=Medium function, H= High function

Restoration Opportunities

See the main discussion of restoration opportunities in the Unincorporated County Section above for restoration opportunities on the Touchet River that may apply to the City of Prescott.

City of Waitsburg

Four of the Touchet River reaches (Reaches 5-8), totaling approximately 157 acres, lie within City of Waitsburg boundaries. The majority of this land is owned by the City. Reach 8 through eastern Waitsburg is the least altered reach. The majority of the shoreline is unarmored with some backwater areas and wetlands and dense riparian vegetation separating uplands from the river along most of the reach. Reaches 6 and 7 are slightly lower functioning due to more alterations from residential development, agriculture practices and areas with little riparian vegetation. Irrigation withdrawals for alfalfa production occur in Reach 6.

Extensive floodplain and floodway areas are mapped within each of the four reaches and the city experienced significant flooding events in 1964 and 1996. Levees are present along the majority of Reaches 5-7, which are used as a public trail. Currently Reach 8 also has a temporary levee along the north side. The levees alter natural hydrologic process and floodway connectivity. Additionally, the Corps has recently required vegetation removal along the levee, lowering vegetative shoreline function.

Priority habitat regions for Northwest White-tailed Deer and Ring-necked Pheasant are mapped within each of the reaches. Presence of Spring Chinook and Summer Steelhead is documented, as well as presumed presence of bull trout.

Touchet River– City of Waitsburg

Process	Function	Notes
Hydrologic	Moderation of sediment transport	Low to moderate hydrologic function is present overall. Extensive floodway and floodplain is mapped throughout Waitsburg, however, levees are present along portions of Reaches 5-7 which lowers connectivity to the floodplain and overall hydrologic function. Very little wetland is present.
	Development and maintenance of in-stream habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	Moderate vegetation functions are present overall. Riparian vegetation is generally present separating the channel from uplands and stabilizing banks. Functions are highest in Reach 8 where a wider vegetated riparian area is present then in the more developed areas of the city.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	Moderate to high habitat functions are present. PHS regions are mapped over a high percentage of all of the reaches. Presence of Spring Chinook and Summer Steelhead is documented, as well as presumed presence of bull trout.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	High hyporheic functions are present due to a high percentage of alluvial soils along the entire Touchet River which help store water and support vegetation within the shoreline area.
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions:

Levees along the majority of Reaches 5-7 are the primary modification to the Waitsburg shorelines. The levees alter natural hydrologic process and floodway connectivity. Agricultural uses and loss of riparian vegetation are also signification modifications.

Select Reach Photos *Aerial images source: Google Earth 2014*

Reach-Based Existing Ecological Functions

Table 5-10, below, provides a summary of functional ranking by reach of the Touchet River within the City of Waitsburg.

Table 5-10. Functional scoring by reach on the Touchet River within the City of Waitsburg,

Relative ranking order from highest to lowest function based on mean reach scores (L= Low function, M=Medium function, H= High function).

Reach Number/ Name		Rank	Hydrologic			Vegetative			Habitat		Hyporheic	
			Moderation of sediment transport	In-stream habitat features	Attenuating flow energy	LWD and organic matter recruitment	Filtration of upland inputs	Bank stabilization	Wetland/riparian habitat	Space and conditions supporting wildlife	Water storage and filtration	Support of vegetation
8	East Waitsburg Rural	1	H	M	H	H	H	H	H	H	H	H
5	Waitsburg Treatment Plant	2	M	M	L	L	M	M	M	H	M	H
6	Waitsburg Agriculture	2	M	L	L	M	M	M	M	H	M	H
7	Waitsburg Mixed Residential	3	M	L	L	M	L	M	M	H	M	H

Restoration Opportunities

See the main discussion of restoration opportunities in the Unincorporated County Section above for restoration opportunities on the Touchet River that may apply to the City of Waitsburg.

5.2.5 Mill Creek

Overview

Mill Creek is a tributary to the Walla Walla River originating in the Blue Mountains. For the purpose of this analysis it has been divided into 15 reaches. Reaches 3 through 11 are in the City of Walla Walla or its UGA, the rest are in unincorporated county.

The conditions in the upper Mill Creek watershed (reaches 13-15) are vastly different from the conditions of the lower watershed (reaches 1-12) through the City of Walla Walla and approaching the confluence with the Walla Walla River. Reach 2 in the county, and the reaches of Mill Creek that flow through the city (3-11) are highly modified from a U.S. Army Corps of Engineers project to control flooding. In contrast, the headwaters portion of the Mill Creek watershed is nearly pristine and has very limited access. Reach 15 is managed as a municipal

watershed to protect the city of Walla Walla's municipal water supply and has been closed to public entry since 1954 (Washington State Department of Ecology 2007).

Documented presence of Kokanee and spawning bull trout occur in Reach 15, the most unaltered reach in the very southeast, mountainous portion of the county. Bull trout, rearing and spawning Spring Chinook and Summer Steelhead are documented throughout the other reaches, however significant fish passage barriers exist in the system, especially through the City of Walla Walla (see below) (WDFW Salmonscape 2014). While highly modified, reaches within the flood control project are recognized as important for migration and rearing of salmonids. Several springs bring in cold water to the concrete channel and allow rearing for salmonid fish. Fish passage corrective actions are currently taking place and will continue (Burns et al. 2009).

Within the City of Walla Walla, the channel has been widened and substantially reinforced with weirs and concrete flumes. These reaches have very low flows during the summer months because the majority of water is diverted down Yellowhawk and Garrison Creeks to provide irrigation water and in-stream flow levels for migrating fish. A hydroelectric plant is present north of Rooks Park near Reach 12 and some return flow enters Mill Creek near Looking Glass Road.

A Memorandum of Understanding exists between the Corps and Ecology regarding the Corps ability to assist Ecology with requests for dividing water between Mill Creek, Yellowhawk and Garrison Creeks. The diversion dam in Reach 12 limits flood waters from entering Yellowhawk and Garrison Creeks but the Corps and Ecology have also developed a general schedule for regulating flows during non-flood periods to maintain adequate flows to sustain fish and fish habitat (MOU between Corps and Ecology 2012).

As conditions within the city limits are generally quite different from those in the unincorporated county, and in recognition that the results of this analysis will potentially be used to create unique SMP provisions for the City of Walla Walla, the city reaches have been rated relative to one another rather than to the less modified county reaches.

The following table provides separate functional summary pages for the unincorporated county reaches and the City of Walla Walla reaches, as well as detailed functional scores and rankings, relative to other reaches within the same local jurisdiction.

Mill Creek– Unincorporated County Reaches

Process	Function	Notes
Hydrologic	Moderation of sediment transport	Moderate to high hydrologic function is present. Significant floodway is present in Reaches 1, 12, 13 and 14, but very little wetland is present throughout the creek. The Mill Creek Diversion Dam located in Reach 12 alters flows and some natural hydrologic processes.
	Development and maintenance of in-stream habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	Intact shrub scrub and forested riparian habitat is present in some upper County reaches (Reaches 13, 15). Reaches 1, 12 and 14 have moderate riparian vegetation along with some residential and agricultural modifications.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	Generally high habitat function is present- PHS habitat is mapped over large portions of Reaches 1, 11-13, and 15, which includes Rocky Mountain Elk habitat in Reach 15. Wetland habitat is present in Reach 12 and some areas of dense riparian upland habitat in Reaches 13 and 15. Anadromous fish presence is documented.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	Moderate to high hyporheic functions are present due to a high percentage of alluvial soils (except in Reach 15) which help store water and support vegetation within the shoreline area.
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions:

The main modification to the Mill Creek shoreline in the county is agricultural and residential uses which have impacted shoreline vegetation and the Corps flood control project which alters flows downstream of Reach 12 and has modified the channel structure in Reach 2.

Reach Photos *Aerial images source: Google Earth 2014*

Unincorporated County

Reach-Based Existing Ecological Functions

Table 5-11, below, provides a summary of functional ranking by unincorporated county reach in Mill Creek.

Table 5-11. Functional scoring by unincorporated county reach on Mill Creek

Relative ranking order from highest to lowest function based on mean reach scores (L= Low function, M=Medium function, H= High function).

Reach Number/ Name		Rank	Hydrologic			Vegetative			Habitat		Hyporheic	
			Moderation of sediment transport	In-stream habitat features	Attenuating flow energy	LWD and organic matter recruitment	Filtration of upland inputs	Bank stabilization	Wetland/riparian habitat	Space and conditions supporting wildlife	Water storage and filtration	Support of vegetation
13	Rural Residential	1	H	M	M	H	H	H	H	H	H	H
15	SE County	2	H	M	L	H	H	H	H	H	M	M
1	Garrett	3	H	H	M	M	M	H	M	H	H	H
12	Diversion Dam	4	L	M	M	M	M	L	H	H	L	H
14	Kooskooskie	5	M	M	M	M	M	M	M	M	M	M
2	Levee	6	L	L	L	L	L	L	L	L	L	M

Restoration Opportunities

Mill Creek is designated as a priority protection stream. Additionally, the Snake River regional technical team has classified Mill Creek upstream of Bennington Dam (Reaches 13-15) as a priority restoration reach with the vision of restoring adequate fish passage where it is lacking. Key limiting factors and objectives noted in the Snake River Salmon Recovery Plan (Snake River Salmon Recovery Board 2011) for the priority protection reach are identified in order of importance below:

1. Embeddedness: less than 10% embeddedness
2. Temperature: not more than 4 days above 72ºF
3. Large Woody Debris: > 1 piece per channel width
4. Riparian: 40% to 90% of maximum

Project- and program-specific opportunities identified in the Snake River Salmon Recovery Board's 3-Year Work Plan (Snake River Salmon Recovery Board 2012) include invasive species

removal, riparian planting, irrigation efficiency studies to increase low flows, fish passage improvements and in-stream habitat work. Project sponsors include the Walla Walla Watershed Management Partnership, Walla County Conservation District, Tri-State Steelheaders, WDFW and the Confederated Tribes of the Umatilla Reservation.

City of Walla Walla

As mentioned above, the Mill Creek channel and shorelines within the city limits and UGA of the City of Walla Walla have been highly modified and conditions and functions vary greatly from the reaches in the unincorporated county. The flow diversion upstream causes very low flows during the summer months. Fish and wildlife habitat is greatly limited due to both flow and channel modifications and barriers, as well as surrounding land use impacts.

Levees are present along 100% of the city shorelines. The upstream portion of Reach 5 and all of Reaches 6, 8 and 9 flow through a narrow concrete flume. Mill Creek flows through an underground pipe (Reach 7) between N. 3rd Avenue and S. Colville Street. The upstream portion of the creek within the City is wider (Reaches 10 and 11).

Functions are highest in Reaches 10 and 11 where the channel is not in a narrow concrete flume and the shoreline is less developed, or where there is still some vegetation present. Shallow alluvial soils are mapped for almost 100% of the city reaches which could help provide hyporheic function in the shorelines that are not covered with impervious surfaces. PHS habitat is mapped over some portion of all reaches except 6-9, including 100% of Reach 11. Reach 9 is predominantly residential development and includes a park and several areas of trees and pervious surface among the houses which slightly raises its vegetative and habitat scores as compared to the other city specific reaches.

Functions are lowest in Reaches 5, 6 and 8, which cover the downtown core and industrial areas, where much of the channel is in the flume and little shoreline vegetation is present. However, Reach 5 does have some undeveloped areas, including one stretch of fairly wide forested and scrub shrub vegetation. Functions are essentially nonexistent in the underground section, other than the actual transmittal of flow.

Reaches 3 and 4 fall in the middle of the functional rankings. Reach 4 is the parcel encompassing the Walla Walla water treatment plant and Reach 3 covers the shoreline jurisdiction within the western UGA. While the shorelines in these reaches are not entirely built out, they are heavily impacted from industrial activity and very little vegetation is present.

Mill Creek– City of Walla Walla Reaches

Process	Function	Notes
Hydrologic	Moderation of sediment transport	Low natural hydrologic function exists, though flood control is provided by the highly modified system. Levees are present along 100% of the city shorelines. The upstream portion of Reach 5 and all of Reaches 6, 8 and 9 flow through a narrow concrete flume. Reach 7 is underground. The upstream city reaches (10 and 11) are wider than those in the flume.
	Development and maintenance of in-stream habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	High intensity development in most of the city reaches greatly limits vegetative function. Vegetative functions are highest in Reaches 10 and 11 where the shoreline is less developed and some public reserve is present. Reach 9 is includes a park and several areas of trees and pervious surface among the houses which slightly raises its vegetative scores.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	PHS habitat is mapped in Reach 11. Elsewhere habitat is greatly limited due to shoreline development and the flume system.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	A very high percentage of alluvial soils is present along the entire creek, however this function is impaired due to high levels of impervious surface.
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions:

The Corps flood control project has highly modified the Mill Creek system through the City of Walla Walla.

Reach Photos *Aerial images source: Google Earth 2014*

Reach-Based Existing Ecological Functions

Generally the same functions and processes outlined in Table 5-4 were used to evaluate City of Walla Walla reaches and the overall result reflects low functions throughout the City. However, in order to distinguish between levels of impairment, criteria were applied somewhat differently for H, M and L scores in consideration of the high level of modification present in the system overall. Best professional judgment was used to evaluate the overall processes and functions present (or absent) and to assign relative ratings in an attempt to better differentiate between levels of modification. For example, more lenient definitions of "broad" and "narrow" were applied and best professional judgment was used rather than numeric thresholds, to allow for more meaningful differentiation between the reach scores, relative to one another. The main characteristics of the reaches which contributed to the ratings are described above.

Table 5-12, below, provides a summary of qualitative functional ranking by reach in Mill Creek through the City of Walla Walla.

Table 5-12. Functional scoring by reach on Mill Creek within the City of Walla Walla

With relative ranking order from highest to lowest function based on mean reach scores (L= Low function, M=Medium function, H= High function)*

Reach Number/ Name		Rank	Hydrologic			Vegetative			Habitat		Hyporheic	
			Moderation of sediment transport	In-stream habitat features	Attenuating flow energy	LWD and organic matter recruitment	Filtration of upland inputs	Bank stabilization	Wetland/riparian habitat	Space and conditions supporting wildlife	Water storage and filtration	Support of vegetation
11	Walla Walla UGA East	1	M	L	M	L	M	L	M	H	L	M
10	Walla Walla Public Reserve/Residential	2	M	M	M	L	M	L	M	M	L	M
9	Walla Walla Residential	3	L	L	L	M	L	L	M	L	L	M
3	Walla Walla UGA West	4	L	L	L	L	L	L	L	M	L	M
4	Walla Walla Water Treatment Plant (Public Reserve)	4	L	L	L	L	L	L	L	M	L	M
5	Walla Walla Commercial/Industrial	5	L	L	L	L	L	L	L	M	L	L
6	Walla Walla Mixed Use	6	L	L	L	L	L	L	L	L	L	L
8	Walla Walla Downtown-Flume	6	L	L	L	L	L	L	L	L	L	L
7	Walla Walla Downtown-Underground	7	N/A	NA	NA	NA	NA	NA	NA	NA	NA	NA

*Functional rankings were assigned qualitatively for the City of Walla Walla in order to compare them independently from the County reaches, and to differentiate between varying levels of impairment (See Section 5.1.2)

Restoration Opportunities

Within the City of Walla Walla, restoration opportunities include improving aquifer recharge to increase stream flows, improving fish passage, and enhancing riparian habitat as opportunities arise. Project- and program- specific opportunities are identified in the Snake River Salmon Recovery Board's 3-Year Work Plan (Snake River Salmon Recovery Board 2012) and are briefly summarized above.

5.2.6 Bennington Lake

Overview

Bennington Lake is a 68-acre off-stream reservoir of the Army Corps Mill Creek diversion project. It is the only public lake within 45 miles of the City of Walla Walla and is a popular location for recreation.

The following page provides a summary of the main functions and impacts in the Bennington Lake shoreline jurisdiction. Below the summary page, a detailed table of the functional scores is provided.

Bennington Lake

Process	Function	Notes
Hydrologic	Moderation of sediment transport	Bennington Lake performs a high level of hydrologic function by providing flood control. The predominant purpose of the lake is storage of flood flows from Mill Creek.
	Development and maintenance of in-stream habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	The majority of the lake shoreline is vegetated with forested or scrub/shrub vegetation. Though the riparian area is generally narrow, it does separate the lake from surrounding uplands.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	PHS regions are mapped over almost all of the Bennington Lake reach. The adjacent open water and vegetated shoreline provides additional habitat features, however some impact to habitat occurs from trails and associated recreational uses.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	N/A
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions:

The lake is highly functioning for its designed purpose of flood control. It also provides some habitat and vegetative functions with slight functional impacts from recreational use.

Image source: US Army Corps of Engineers

Reach-Based Existing Ecological Functions

Table 5-13, below, provides a summary of functional ranking for Bennington Lake.

Table 5-13. Functional scoring for Bennington Lake

L= Low function, M=Medium function, H= High function

Reach Number/ Name		Rank	Hydrologic			Vegetative			Habitat		Hyporheic	
			Moderation of sediment transport	In-stream habitat features	Attenuating flow energy	LWD and organic matter recruitment	Filtration of upland inputs	Bank stabilization	Wetland/riparian habitat	Space and conditions supporting wildlife	Water storage and filtration	Support of vegetation
1	Bennington Lake	NA	NA*	NA*	NA*	M	M	H	M	H	NA**	NA**

*The selected hydrologic criteria used for the functional analysis of the stream reaches are not generally present in a lacustrine environment. However, the main purpose of the lake is water storage for flood control, which it is providing. Therefore the hydrologic function is rated "high" overall.
**Hyporheic functions are not generally significant in a lacustrine environment and were not evaluated

Restoration Opportunities

An ongoing effort is underway to improve fish passage and screening at the Bennington Lake Diversion Dam. The 2011 National Marine Fisheries Service Biological Opinion regarding operation of the Mill Creek Project included a jeopardy determination for the Middle Columbia River steelhead Distinct Population Segment, indicating that operation of the Mill Creek Project is likely to hinder the survival and recovery of the Middle Columbia River steelhead Distinct Population Segment run. In 2012, an alternatives assessment led to the identification of a preferred alternative and initiation of designs. The Corps will pursue funding to complete the improvements in the near future.

5.2.7 Yellowhawk Creek

Overview

Yellowhawk Creek is a tributary to the Walla Walla River, entering the Walla Walla River just west of Old Milton Highway. It originates as a distributary of Mill Creek at the Corps operated diversion structure located just south of Walla Walla Community College. Downstream from the diversion structure three tributaries enter Yellowhawk Creek (Caldwell, Russell, and Cottonwood Creeks, respectively). Based on stream flow data collected on Yellowhawk Creek by the Walla Walla Basin Watershed Council from May 2009 to September 2013 at a gage station located approximately 1,000 feet upstream from its confluence with the Walla Walla River,

mean annual flow for Yellowhawk Creek near its mouth varied between a low of 30.8 cfs (2012-2013 WY) to a high of 53.5 cfs (2010-2011 WY), with an overall mean annual flow of 39.1 cfs. Per the evaluation of this stream flow record and recent site visits it was determined that Yellowhawk Creek meets the 20 cfs mean annual flow threshold to be considered a Shoreline of the State from Cottonwood Creek downstream to the confluence with the Walla Walla River.

Land use within the Yellowhawk reach is predominantly agricultural with some rural residential uses throughout. The Mill Creek diversion dam operated by the Corps (see Section 5.2.6) limits flood flows from entering Yellowhawk Creek but may also be adjusted to regulate flows during non-flood periods to maintain adequate flows to sustain fish and fish habitat. The Corps and Ecology have developed a general schedule for non-flood flow regulation (MOU between Corps and Ecology 2012). The presence of Spring Chinook is documented throughout all of Yellowhawk Creek, as well as documented spawning habitat for Summer Steelhead (WDFW Salmonscape 2014).

The following page provides a summary of the main functions and impacts in the Yellowhawk Creek shoreline jurisdiction for each of the four ecological processes categories identified in Table 5-2. Below the summary page, a detailed table of the functional scores is provided.

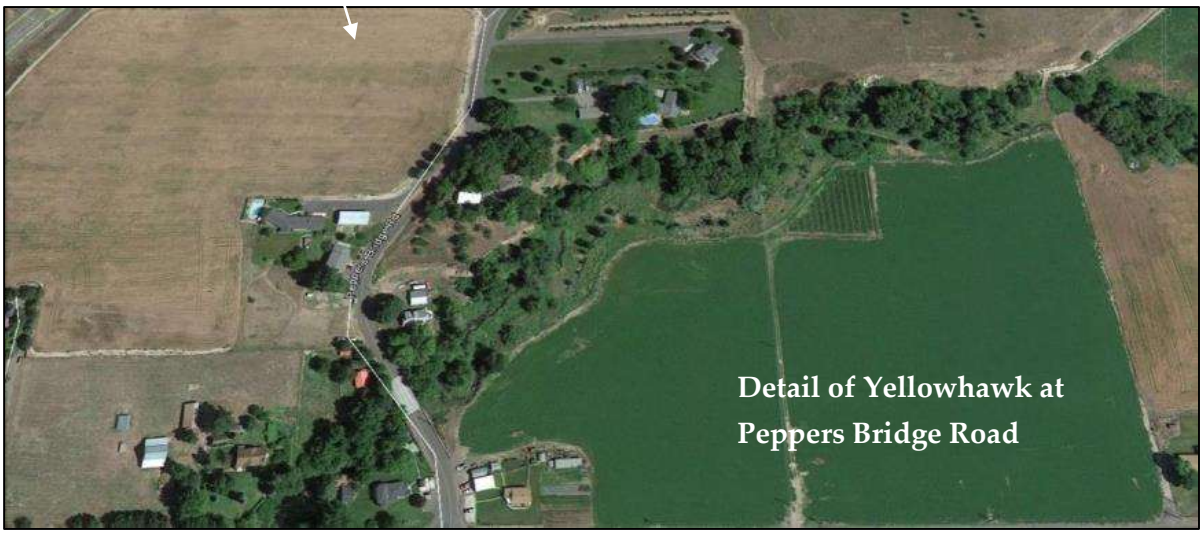
Yellowhawk Creek

Process	Function	Notes
Hydrologic	Moderation of sediment transport	Hydrologic function varies- No armoring or dams are present and moderation of sediment transport function is high. However, flows are regulated by the Mill Creek diversion dam. No wetland and little backwater areas or off-channel habitat is present in this portion of the creek. Extensive floodplain is present but flow control limits flood waters from entering the channel.
	Development and maintenance of in-stream habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	Vegetation function also varies- Dense, though narrow bands of forested and shrub vegetation exists along the banks of the channel, providing some screening between the channel and agricultural lands and residential development.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	Moderate to high habitat function is present. Several road crossings limit habitat connectivity and riparian habitat is narrow, though dense, in many places. No wetland is mapped. However, PHS regions are mapped throughout the reach and there is documented anadromous fish use.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	High hyporheic functions are present due to a high percentage of alluvial soils along the entire Touchet River which help store water and support vegetation within the shoreline area.
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions:

The main modifications along this creek are alteration of vegetation by agricultural and residential development, and flow regulation from the Mill Creek diversion dam.

Reach Photos *Aerial images source: Google Earth 2014*



Reach-Based Existing Ecological Functions

Table 5-14, below, provides a summary of functional ranking for the Yellowhawk Creek reach from Cottonwood Creek to the confluence with the Walla Walla River.

Table 5-14. Functional scoring by reach on Yellowhawk Creek

Relative ranking order from highest to lowest function based on mean reach scores (L= Low function, M=Medium function, H= High function).

Reach Number/ Name		Rank	Hydrologic			Vegetative			Habitat		Hyporheic	
			Moderation of sediment transport	In-stream habitat features	Attenuating flow energy	LWD and organic matter recruitment	Filtration of upland inputs	Bank stabilization	Wetland/riparian habitat	Space and conditions supporting wildlife	Water storage and filtration	Support of vegetation
1	Yellowhawk Creek	NA	H	L	M	L	M	H	M	H	M	H

Restoration Opportunities

An ongoing effort is underway to improve fish passage and screening at the Bennington Lake Diversion Dam. The 2011 National Marine Fisheries Service Biological Opinion regarding operation of the Mill Creek Project included a jeopardy determination for the Middle Columbia River steelhead Distinct Population Segment, indicating that operation of the Mill Creek Project is likely to hinder the survival and recovery of the Middle Columbia River steelhead Distinct Population Segment run. In 2012, an alternatives assessment led to the identification of a preferred alternative and initiation of designs. The Corps will pursue funding to complete the improvements in the near future.

6 LAND USE ANALYSIS

6.1 Bennington Lake

6.1.1 Current Land Use

Based on Walla Walla County Assessor data for parcels completely or partially located within shoreline jurisdiction, the Bennington Lake shoreline is primarily classified as being in public use. While approximately 14 acres of the shoreline environment are classified as resource production and extraction, these areas are federally-owned and are

not actively farmed. In practice, the entire shoreline area is devoted to recreational uses and flood management by the U.S. Army Corps of Engineers.

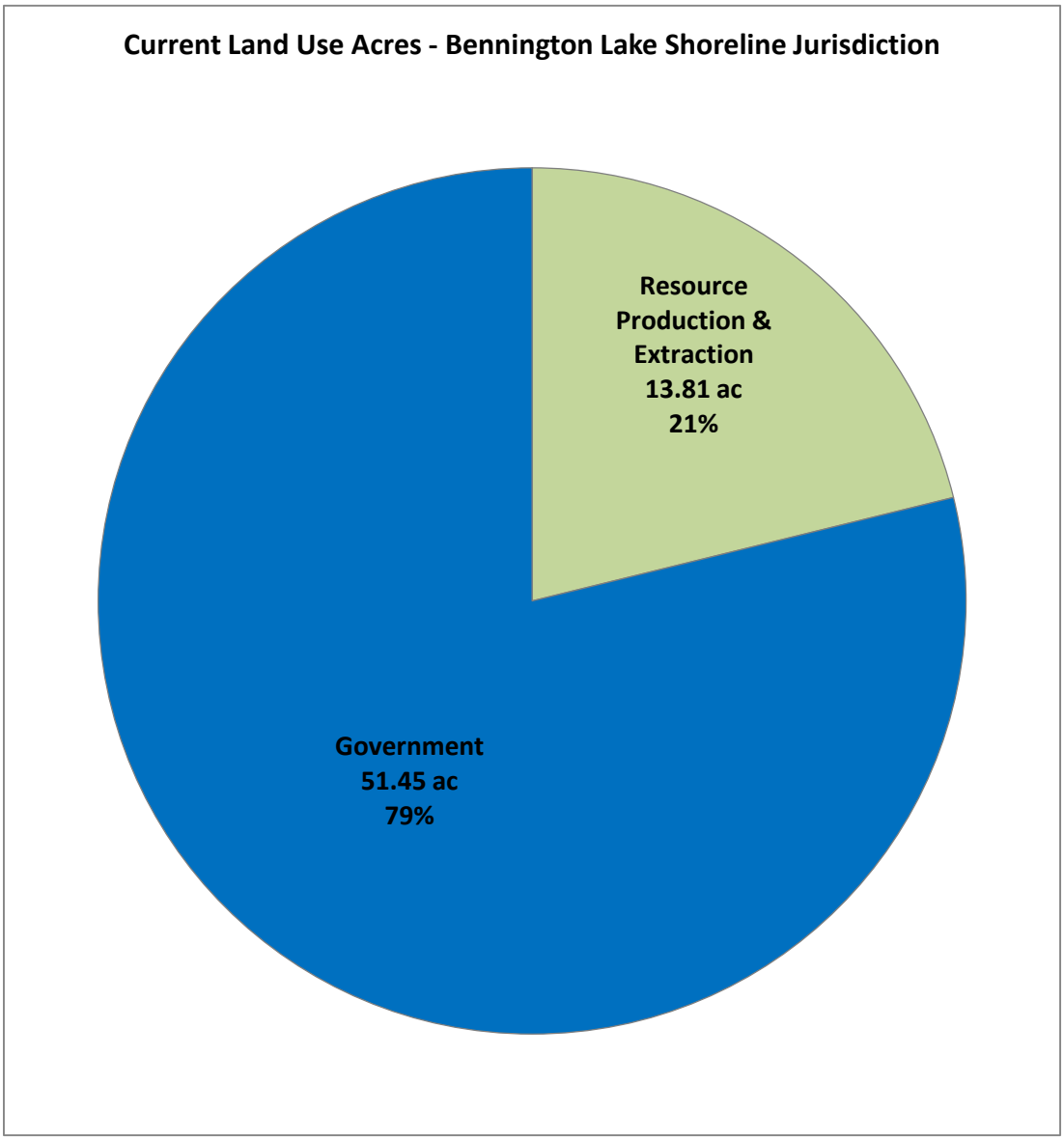


Exhibit 6-1. Current Land Use – Bennington Lake

Source: Walla Walla County Assessor, 2014.

Water-Oriented Uses

Water-dependent and water-related uses include Bennington Lake itself, which is a Corps-operated flood management project fed by a diversion dam on Mill Creek to the north. Water level monitoring equipment and the diversion flume itself are also present within the Bennington Lake reach.

Water-enjoyment uses consist of recreational activities provided by the surrounding federally-operated park and trail system, which are described in detail in Section 6.1.3.

Transportation and Utilities

Transportation infrastructure in the vicinity of Bennington Lake consists of a single public roadway, Reservoir Road, which provides access to the lake and surrounding recreation area from North Tausick Way, northwest of the lake. As described in Section 6.1.3, on-site multipurpose trails provide non-motorized transportation access within the recreation area and to points north along Mill Creek.

Bennington Lake is a flood control reservoir maintained by the U.S. Army Corps of Engineers, and is itself, in essence, a utility facility. Other utilities in the area include electric power for on-site equipment.

6.1.2 Future Land Use

Bennington Lake is entirely zoned Exclusive Agriculture (120 acres). Due to the presence of the federal flood control facility and the large minimum lot size required under zoning regulations, future development in this area is anticipated to be minimal and would, in all likelihood, be directly related to flood control or recreation.

6.1.3 Existing and Potential Public Access

Parks and Open Space

Bennington Lake is a flood control reservoir maintained by the Corps. The lake is surrounded by approximately 68 acres of federally-owned land and offers a variety of amenities, including picnic areas, trails, and a boat ramp.

Recreation: Boat Launches and Trails

Bennington Lake features a single boat launch and associated parking area. Internal combustion boat engines are prohibited on the lake.

The Bennington Lake recreation area offers access to a number of local, Corps-maintained trails that cover the area surrounding the lake itself, as well as extending north to Rooks Park at the Mill Creek diversion dam. These trails include the following:

- Bennington Lake National Recreation Trail System (20+ miles)
- Kingfisher Trail (1.7 miles)
- Meadowlark Trail (2.6 miles)
- Whitetail Trail (4.8 miles)

Future Public Access

The entirety of the Bennington Lake reach consists of public land devoted to recreation and water access. The Corps will, in all likelihood, continue to maintain the existing public access facilities at this location and make improvements as necessary, but no major facility additions are anticipated in the foreseeable future.

Potential Population and Future Tourism Demand

While no residential development is anticipated within the immediate vicinity of Bennington Lake due to federal ownership of the land, the recreation area is only a short distance from the City of Walla Walla, the largest population center in the county. As population growth continues in nearby urban areas, Bennington Lake is likely to be an attractive recreational option for area residents, increasing the number of annual visitors and placing greater demand on the existing facilities.

Walla Walla is also a center of regional tourism, and visitors come from across Washington to tour local wineries and visit historic sites, among other activities. As more visitors come to the area, it is likely that demand at the Bennington Lake facilities will increase, as well.

6.1.4 Historic and Archeological Sites

No historic or archaeological sites have been documented at Bennington Lake. Because the site is a Corps-managed flood control project, the lake level is regulated by the Mill Creek Diversion Dam, and the current shoreline does not represent historic conditions. As a result, the potential for discovery of undocumented cultural resources is likely to be relatively low.

6.2 Snake River

6.2.1 Current Land Use

Based on Walla Walla County Assessor data for parcels completely or partially located within shoreline jurisdiction, the most prevalent land use along the Snake River shoreline is resource production and extraction, primarily in the form of agriculture. Undeveloped land and transportation/communication/utility facilities also occupy a large portion of the shoreline.

Current land uses on the Snake River shoreline are summarized below in

Exhibit 6-2.

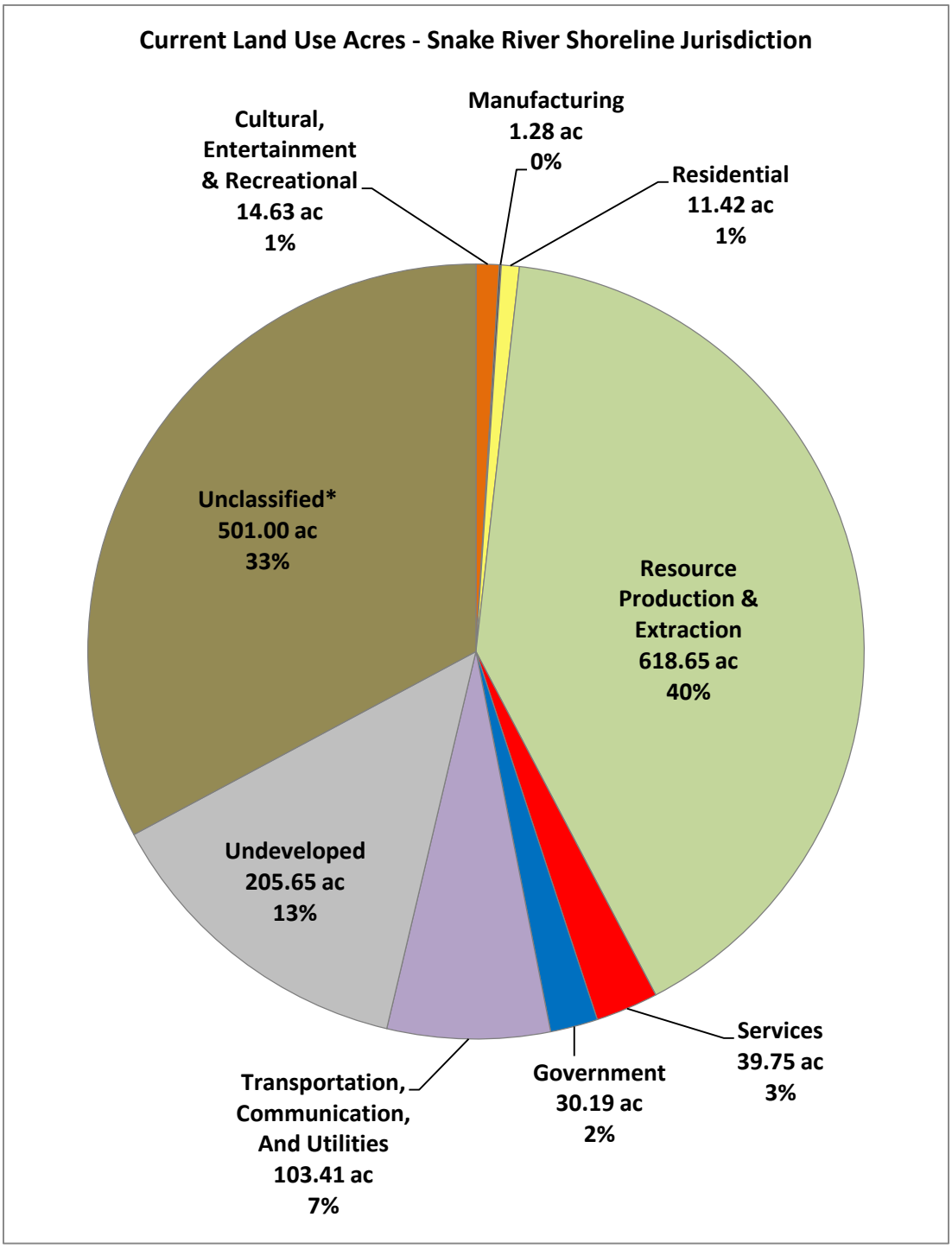


Exhibit 6-2. Current Land Use – Snake River

*Unclassified land represents parcels for which the Walla Walla County Assessor has not assigned a land use category. Review of aerial photography indicates that unclassified lands consist primarily of federally-owned land, Corps-managed dam and flood control projects, and transportation and utility infrastructure.

Source: Walla Walla County Assessor, 2014.

As shown in

Exhibit 6-2, nearly one-third of the Snake River shoreline is occupied by "Unclassified" land uses. These areas represent parcels for which the Walla Walla County Assessor has not assigned land use category in their records. Review of these properties via aerial photography indicates that this land consists of federally-owned properties associated with U.S. Army Corps of Engineers-managed dams and parks or transportation and utility infrastructure associated with railroad operations or hydroelectric power generation. A more detailed discussion of transportation and utility infrastructure in the shoreline environment is contained in the following sections.

Water-Oriented Uses

Along the Snake River, water-dependent uses include the Ice Harbor and Lower Monumental Dams, docks supporting barge traffic on the river, and recreational boat launches, which are discussed in detail in Section 6.2.4. Industrial docks and barge slips are concentrated in the Burbank area, where the Port of Walla Walla operates the Burbank Industrial Park and Burbank Business Park. The Port also operates a grain shipping facility at the Sheffler site, located roughly halfway between the Ice Harbor and Lower Monumental dams, under lease from the Army Corps of Engineers. The Sheffler facility was recently expanded and serves as the primary grain shipping site for farmers in this portion of Walla Walla County.

Water-related uses include hydroelectric power production and irrigation facilities, such as withdrawal pumping stations and canals. Water-enjoyment uses consist primarily of recreational uses, including parks, boat launches, trails, campsites, and open space. Public access is discussed in Section 6.2.3 below.

Transportation and Utilities

Transportation facilities along the Snake River include state and U.S. highways, county roads, private access roads, and railroads. Goods and materials, primarily grain and wood products, are also transported by barge on the Snake River itself, and the U.S. Army Corps of Engineers maintains a dredged navigation channel for barge traffic. In Walla Walla County, the Snake River is dammed at two locations, Ice Harbor Dam and Lower Monumental Dam, to facilitate navigation and generate hydroelectric power.

SR 124 and U.S. 12 cross the Snake River immediately upstream of its confluence with the Columbia River near Burbank; this is the only vehicular bridge crossing of the Snake in Walla Walla County. All other roadways along the Snake consist of County roads and private roadways that provide access to agricultural, residential, and industrial areas along the river, including access roads for the federally-maintained dams.

The Union Pacific Railroad follows the south bank of the Snake River from the Ice Harbor Dam all the way to the northeastern corner of the county, finally crossing the river north into Franklin County, a distance of over 50 miles. The railroad ultimately connects to the cities of Cheney, Spokane, and Coeur d'Alene. Materials transported by rail along the Snake River include grain, coal, and closed shipping containers for miscellaneous goods.

Utility systems along the Snake River consist mostly of the hydroelectric generation facilities located at the Ice Harbor and Lower Monumental dams, but also include the following:

- Water and sewer utilities serving residential development in the Burbank area.
- Electric transmission and distribution lines serving shoreline development in the Burbank area.
- Electric power transmission infrastructure serving hydroelectric generation projects on the river, including a Bonneville Power Administration (BPA) substation located adjacent to the Lower Monumental Dam.

Future utilities along the Snake River would include expansion of the existing BPA substation at the Lower Monumental Dam as part of the upcoming Central Ferry-Lower Monumental Transmission Line Project, which would construct a new 500 kilo-volt (kV) transmission line across northern Walla Walla County to connect the Lower Monumental Dam substation with the Central Ferry substation in Garfield County. Project construction is scheduled to begin in 2014, with final line energization in late 2015.

6.2.2 Future Land Use

The majority of the Snake River shoreline is zoned Primary Agriculture (minimum lot size of 40 acres), followed by Public Reserve. In the Burbank area, approximately 18 acres are zoned Heavy Industrial, and approximately 30 acres are zoned Rural Residential (minimum lot size of 2 acres). Exhibit 6-3 shows zoned acres by shoreline reach, as well as the percentage of each reaches covered by different zoning districts. As illustrated by the exhibit, the upper reaches of the river are intended for primarily agricultural development, while the downstream reaches are more varied, incorporating residential uses, industry, and public uses associated with Corps-managed facilities.

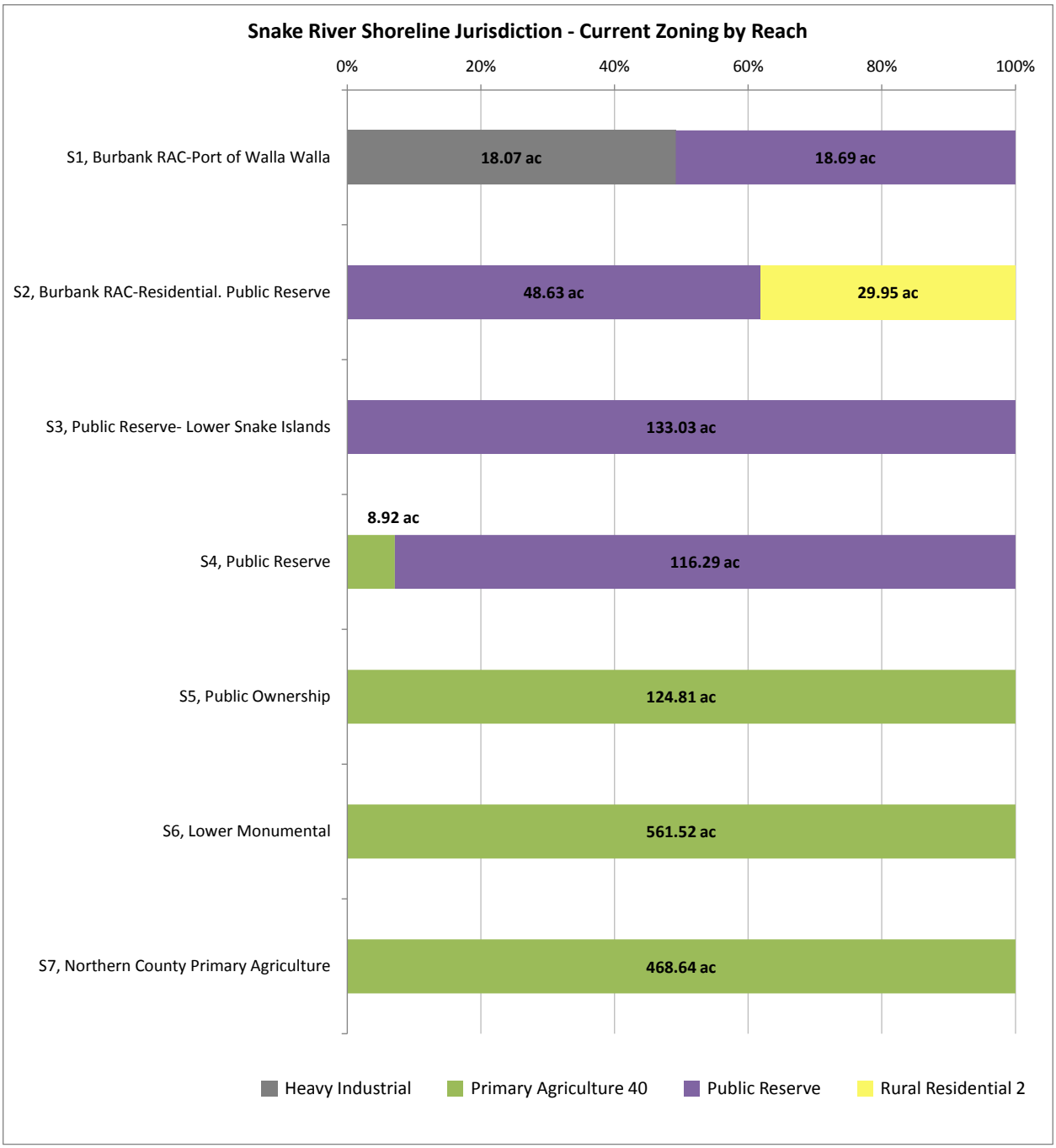


Exhibit 6-3. Snake River Zoning by Reach

Source: Walla Walla Joint Community Development Agency, 2014.

Very little land on the Snake River is vacant and available for development. Much of the land classified as "Undeveloped" is in government ownership and not available for private residential, commercial, or industrial development. Only approximately 4 acres of vacant parcels lie along the Snake River, of which only 1.8 acres are within shoreline

jurisdiction. All of these properties are zoned Rural Residential (2 acres), and while none of them currently meet the minimum size requirements for new parcels, they were legal lots at the time of creation and are available for development. Development of these lots would add up to 6 new residences to the Snake River shoreline, all located in the Burbank area.

In addition to vacant residential properties, capacity for additional development is available at the Burbank Industrial Park owned by the Port of Walla Walla. The Port has planned substantial improvements and renovations to the industrial park over the next 10 years, as documented in the Port's comprehensive plan, adopted in 2012. Planned improvements include new commodity storage buildings, barge slip improvements, improvements to existing grain facilities, expansion of water and sewer systems, and construction of a new rail line connection to the industrial park.

6.2.3 Existing and Potential Public Access

Parks and Open Space

Existing parks and public access opportunities along the Snake River include Hood Park, Ice Harbor Dam, Charbonneau Park, Fish Hook Park, and the Ayer Boat Basin. County, state, and federally-owned land along the Snake River is summarized in the table below.

Table 6-1. Parks and Open Space Acres by Reach – Snake River

Reach	Ownership	Acres in Jurisdiction
S1 – Burbank RAC/Port of Walla Walla	County	15.6
S2 – Burbank RAC/Residential/Public Reserve	County	16.3
S3 – Public Reserve/Lower Snake Islands	County	16.0
S4 – Public Reserve	County	45.9
	Federal	37.7
S5 – Public Ownership	Federal	31.0
S6 – Lower Monumental	Federal	43.9
S7 – Northern County Primary Ag	County	50.7

Source: Walla Walla County Assessor, 2013.

Recreation: Boat Launches and Trails

Boat launches are available on the Snake River at the following locations:

- Hood Park – Located in Burbank, just upstream of the Snake/Columbia confluence, the Corps-managed park provides camping, day use areas, and a 3-lane boat launch.

- Charbonneau Park – Located approximately 2 miles upstream of Ice Harbor Dam, Charbonneau Park is managed by the U.S. Army Corps of Engineers and provides camping, picnicking, fishing, hiking, and hunting, in addition to a boat ramp.
- Fish Hook Park – Located approximately 7 miles upstream of Ice Harbor Dam, this Corps-managed park provides campsites, day-use areas, and a 2-lane paved boat launch.
- Lower Monumental Boat Launch – Located approximately one mile downstream of the Lower Monumental Dam, this boat launch is located on federal land and provides a one-lane launch with limited parking.
- Ayer Boat Basin – Located just downstream from the community of Ayer, the boat basin provides primitive camp sites, vault toilets, and a boat launch facility.

The Snake River is also a designated route for the Northwest Discovery Water Trail along its entire length in Walla Walla County. The Water Trail stretches 367 miles from the Clearwater River in Idaho to the Bonneville Dam on the Columbia River and provides tourists with boating and camping opportunities along the river.

Future Public Access

Walla Walla County has not historically served as a provider of parks and open space, and the County has not identified future improvements at any shoreline parks. The Corps conducts ongoing maintenance and improvements of its dam and park facilities. The Port of Walla Walla completed a master plan for its Cargill Pond site on the Snake River in 2011. The master plan features a park design with public water access, including a boat ramp, a swimming area, waterfront pedestrian trails, lawn areas, habitat plantings, rest areas, and sports facilities. Phase I of the Cargill Pond redevelopment is planned to be complete by 2017. Phases II-IV are planned to be complete by 2022.

It is anticipated that additional opportunities for improved public access to the shoreline will be identified as part of the SMP planning process.

Potential Population and Future Tourism Demand

Outside of the Burbank area, zoning along the Snake River shoreline is almost entirely agricultural, and future population growth is anticipated to be very low. Upstream recreational areas are frequented by boaters and campers, but their remoteness is likely to limit increases in use from tourism to moderate levels.

Due to the presence of residential development in Burbank Heights and the proximity of the Tri-Cities, public access points near the confluence of the Snake and Columbia Rivers may experience increased usage from both population growth and tourism.

6.2.4 Historic and Archeological Sites

The Snake River has been a major regional waterway for centuries, providing fishing, hunting, and transportation for native peoples, particularly as it provides downstream access to the Columbia River, which ultimately flows to the Pacific Ocean. After European settlement of the region and the rise of agriculture and mineral extraction operations, the Snake provided a means to transport goods downstream to the Columbia River. Similar to the Columbia River, numerous sections of the Snake were dammed in the early and mid-20th Century to ease navigation, provide irrigation water, and generate hydroelectric power. The portion of the Snake that borders Walla Walla County contains two dams: the Ice Harbor Dam was completed in 1961, and the Lower Monumental Dam was completed in 1969. While these two structures are not included in local or national registers of historic sites, both are more than 50 years old.

The Snake River is also designated as part of the Lewis and Clark National Historic Trail, and approximate locations have been identified for several of the riverside campsites recorded in the expedition's journals. No historic or archaeological sites are documented on the Snake River in Walla Walla County, but its long use for fishing, hunting, and transportation by both native peoples and post-settlement occupants makes it likely that undocumented cultural resources exist along the shoreline.

6.3 Columbia River

6.3.1 Current Land Use

The Columbia River shoreline in Walla Walla County is characterized by a mix of industrial, resource production and extraction, and government-owned public uses. Walla Walla County Assessor data for parcels completely or partially located within shoreline jurisdiction is summarized in Exhibit 6-4. The largest land use category is Unclassified, which consists of properties to which the Assessor has not assigned a land use value. Review of aerial photography indicates that most of this land is occupied by federally-owned property associated with Corps-managed parks or the McNary National Wildlife Refuge.

The Port of Walla Walla manages several industrial properties along the Columbia River shoreline, including the following:

- Ady Industrial Site – Located just south of the Burbank Rural Activity Center, the Port owns approximately 110 acres of industrially-zoned shoreline property. The majority of the land is underwater, and the limited upland areas are currently vacant.
- Dodd Road Industrial Park – Located in the Attalia Industrial UGA north of Wallula, the Dodd Road Industrial Park encompasses approximately 289 acres zoned for heavy industry. Most of the industrial park is currently vacant, but Railex, LLC owns approximately 53 acres and operates a produce and wine distribution facility. The remainder of the park is currently Port owned.
- Attalia Industrial Site – Located within the Attalia Industrial UGA and south of the Dodd Road Industrial Park, the Port of Walla Walla owns approximately 90 acres of vacant shoreline property zoned for heavy industry and agricultural industrial uses. The majority of this land is underwater, and limited upland area is available for development.
- Wallula Industrial Park-Shipping Terminal – Located at the mouth of the Walla Walla River, the Port owns approximately 41 acres zoned for rural commercial and industrial development, as well as agriculture. The property is currently vacant, but it is located adjacent to an existing Northwest Grain Growers grain elevator facility, which includes a public barge slip.

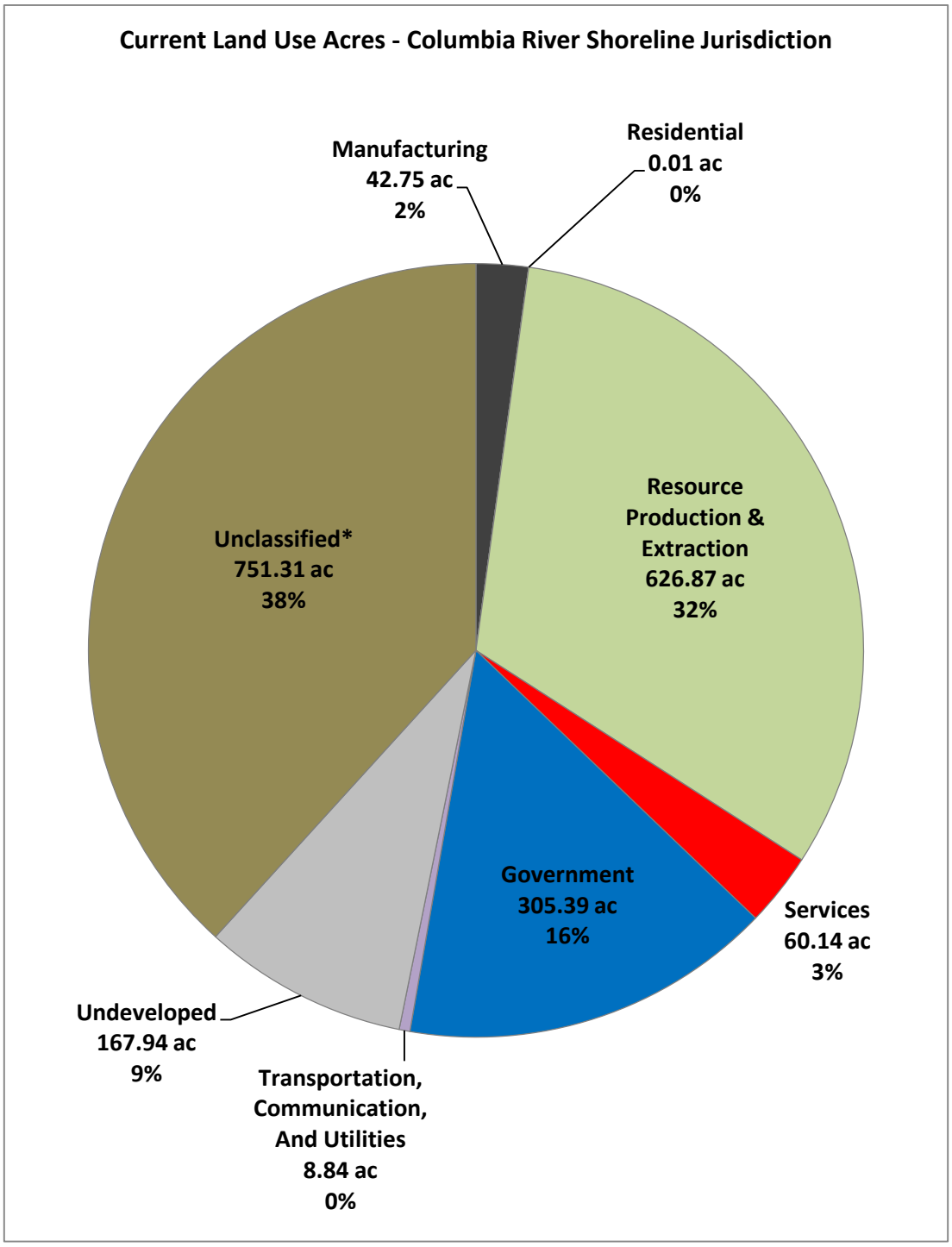


Exhibit 6-4. Current Land Use – Columbia River

*Unclassified land represents parcels for which the Walla Walla County Assessor has not assigned a land use category. Review of aerial photography indicates that unclassified lands consist primarily of federally-owned land, Corps-managed dam and flood control projects, and transportation and utility infrastructure.

Source: Walla Walla County Assessor, 2014.

Water-Oriented Uses

Water-dependent uses on the Columbia River include docks and wastewater outfalls for industrial development, as well as private docks for recreational boating. As described under current land use, the Port of Walla Walla owns and manages several industrial parks and shipping facilities along the Columbia River that include barge slips and docks. Water-related uses include irrigation pumping stations and maintenance/access roads for railroad facilities. Water enjoyment uses occupy a large amount of the shoreline, consisting of the McNary National Wildlife Refuge, several USFWS wildlife habitat management units, and riverside parks and trails. Public access to the shoreline is described in detail in Section 6.3.3.

Transportation and Utilities

Transportation facilities along the Columbia River include U.S. highways, county roads, private access roads, and railroads. Goods and materials are also transported by barge on the Columbia River itself. All of the Columbia River shoreline in Walla Walla County consists of the man-made Lake Wallula, and no dams are present on this stretch of the river.

Highways on the Columbia River include U.S.12, which follows the river south from Burbank to Smiths Harbor before turning east along the Walla Walla River. U.S. 730 continues from this junction and follows the east bank of the river south into Oregon. No vehicular bridges cross the Columbia River in Walla Walla County. Other vehicular transportation infrastructure includes county and private roads providing access to residential, commercial, industrial, and public access uses along the Lake Wallula shoreline.

Railroads parallel the Columbia River shoreline along its entire length in Walla Walla County. The BNSF railroad crosses the Snake River confluence, terminating at Burbank. The Union Pacific connects at this point and follows the Columbia south. A second Union Pacific lines crosses the Columbia from Benton County north of Foundation Island and joins the rail corridor. These rail lines primarily serve the Attalia Industrial UGA.

Utility systems along the Columbia River include:

- Water utilities serving residential development in the Burbank and Wallula areas.

- On-site septic systems serving residential development in the Burbank area.
- Electric transmission and distribution lines serving shoreline development in the Burbank area and the Attalia Industrial UGA.

6.3.2 Future Land Use

The vast majority of the Columbia River shoreline is zoned Public Reserve, which is intended for open space uses, such as parks, cultural facilities, and wildlife habitat. The Primary Agriculture (minimum 40 acres), Industrial Agriculture Heavy, and Heavy Industrial zones comprise the next largest portion of the shoreline. A relatively small amount of the shoreline is zoned for Industrial/Business Park, Rural Activity Center, and Rural Development – Commercial/Industrial. Exhibit 6-5 shows zoned acres by shoreline reach, as well as the percentage of each reach covered by each zoning district.

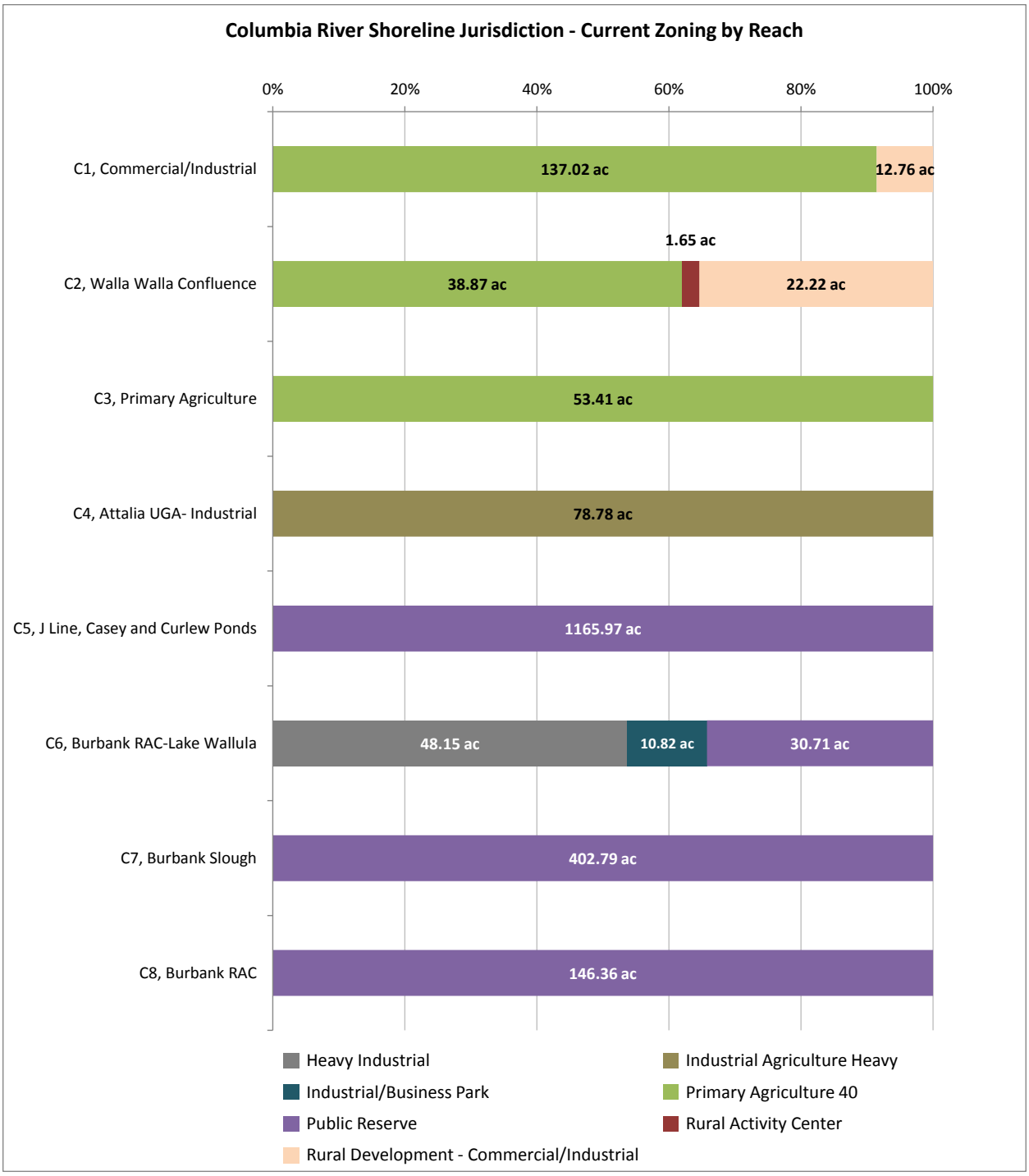


Exhibit 6-5. Columbia River Zoning by Reach

Source: Walla Walla Joint Community Development Agency, 2014.

Relatively little land on the Columbia River shoreline is vacant and available for development. Similar to the Snake River, government ownership is widespread in the area, and much of the land classified as "Undeveloped" is not available for private development. Approximately 22 acres near the Walla Walla confluence are vacant and available for development for industrial uses, of which approximately 4 acres are within shoreline jurisdiction.

Review of the existing development in the Attalia Industrial UGA indicates that most industrial facilities in the area have a Floor Area Ratio (FAR) of 0.15. FAR represents the ratio of building floor area to the overall size of the building site. For example, a one-story building that covers half of the lot on which it is located would have an FAR of 0.5. Based on the prevailing existing FAR of 0.15 in the Attalia Industrial UGA, vacant properties could potentially generate an additional 26,600 square feet of industrial space in the shoreline environment.

In addition to vacant properties, additional development may occur through expansion of existing facilities, most notably at shoreline industrial parks. As described under Current Land Use, the Dodd Road Industrial Park has capacity for additional industrial development, and the Port plans to invest in additional improvements, such as enhanced rail access and expanded utility systems, to foster future growth in this location. The Wallula Industrial Park-Shipping Terminal site also has capacity for additional development. This site lies partially within a Local Area of More Intensive Rural Development (LAMIRD), as designated by Walla Walla County. LAMIRD's support localized clusters of intensive development, such as industry or agricultural goods processing, in rural areas, and additional industrial development is anticipated to occur at this location over time.

6.3.3 Existing and Potential Public Access

Parks and Open Space

Existing public access along the Columbia River consists primarily of federal land ownership, most of which is encompassed by the McNary National Wildlife Refuge. The refuge, centered on Burbank Slough, encompasses roughly 15,000 acres, approximately 1,400 acres of which are in shoreline jurisdiction. A breakdown of public access acreage by reach is presented in Table 6-2.

Table 6-2. Parks and Open Space Acres by Reach – Columbia River

Reach	Ownership	Acres in Jurisdiction
C1 – Commercial/Industrial	County	8.9
C2 – Walla Walla Confluence	Federal	1.7
C4 – Attalia UGA/Industrial	Federal	28.7
C5 – J Line, Casey, and Curlew Ponds	Federal	1,106.6
C6 – Burbank RAC/Lake Wallula	Federal	33.4
C7 – Burbank Slough	Federal	375.1

C8 – Burbank RAC	Federal	144.8

Source: Walla Walla County Assessor, 2013.

As described above, parks and open space along the Columbia consist mostly of national wildlife refuge and habitat management areas. In addition to the McNary Wildlife Refuge, the Columbia River shoreline jurisdiction contains portion of the Peninsula Habitat Management Unit south of Burbank and the Two Rivers Habitat Management Unit at the southern end of the McNary refuge. Other parks include:

- Madame Dorian Memorial Park at the mouth of the Walla Walla River, operated by the U.S. Fish and Wildlife Service (USFWS).
- Wallula Gap National Natural Landmark Area (Twin Sisters), located approximately 1 mile south of the mouth of the Walla Walla River.
- Port Kelley, located approximately 2 miles south of the mouth of the Walla Walla River. The private property is the home of the Walla Walla Yacht Club, and the site includes boat moorage, boat launches, trailer parking, and a small park area.

In addition to the formal parks and recreation areas described above, anecdotal information from local residents indicates that informal fishing access exists on the southern reaches of the Columbia River, and recreational anglers often park their cars along the railroad right-of-way and walk across the tracks to fish.

Recreation: Boat Launches and Trails

Public boat launches are available at only one location on the Columbia River, the McNary Wildlife Refuge, located at the mouth of Burbank Slough (Reach C7). The Walla Walla Yacht Club facility in Reach C1 offers moorage and boat launches for club members. While technically located on the Walla Walla River, a boat launch is also available at Madame Dorian Memorial Park, located where the Walla Walla River flows into the Columbia.

Trails on the Columbia River shoreline include the following:

- McNary Interpretive Trail – A 1.9-mile interpretive pedestrian trail located at the McNary Wildlife Refuge along Burbank Slough. The trail starts at the McNary Environmental Education Center and follows the slough edge before looping through the shrub-steppe uplands.

- McNary Refuge Horse Trail – A 4-mile riverside equestrian trail in the Peninsula Unit of the McNary Wildlife Refuge.
- Northwest Discovery Water Trail – The NDWT stretches 367 miles from the Clearwater River in Idaho to the Bonneville Dam on the Columbia River. The Columbia River is part of the trail route from the confluence with the Snake River south to the Bonneville Dam in Oregon. The water trail provides tourists with boating and camping opportunities along the river.

Future Public Access

Walla Walla County has not historically served as a provider of parks and open space, and the County has not identified future improvements at any shoreline parks. The USFWS conducts ongoing maintenance and improvements of its facilities at the McNary Wildlife Refuge and other habitat management areas. It is anticipated that additional opportunities for improved public access to the shoreline will be identified as part of the SMP planning process. Members of the public have expressed interest in the potential addition of a fishing pier at Port Kelley to provide additional public access.

Potential Population and Future Tourism Demand

Most of the Columbia River shoreline in Walla Walla County is in federal ownership, and adopted zoning in the shoreline area is mostly focused on agricultural and industrial uses, limiting the potential for significant future population growth along the Columbia. However, the McNary Wildlife Refuge is located only a short distance away from the Tri-Cities, a major population center for Benton and Franklin Counties. As population growth occurs in these cities and Walla Walla County continues as a center of regional tourism, it is possible that visitors from outside Walla Walla County may increase usage of the wildlife refuge and its facilities.

6.3.4 Historic and Archeological Sites

The Columbia River has been a major inland waterway for centuries, providing fishing, hunting, and transportation for native peoples. After European settlement of the region, resource-based agriculture and mining operations became more common, leading to increased use of the river as a transportation route for both imported and exported goods. Numerous sections of the Columbia River were dammed in the early and mid-20th Century to ease navigation, provide irrigation water, and generate hydroelectric power. A byproduct of this process was alteration of the historic shoreline in many areas. Due to the long history of water and shoreline use by both native peoples and European settlers, the Columbia River valley contains numerous documented historic and archaeological sites and is likely to contain many undocumented archaeological

resources, as well. However, due to continual dam construction over the previous century, most notably the construction of the McNary Dam and the creation of Lake Wallula, many of these archaeological resources may now be lost.

In Walla Walla County, cultural resources sited on the Columbia River are concentrated at the McNary Wildlife Refuge, specifically at the northwest end of Burbank Slough. The wildlife refuge contains 9 documented historic structures, including quarters, storage and service buildings, a shop, and a set of granaries.

6.4 Walla Walla River

6.4.1 Current Land Use

Based on Walla Walla County Assessor data for parcels completely or partially located within shoreline jurisdiction, the most prevalent land use along the Walla Walla River shoreline is resource production and extraction, primarily in the form of agriculture. Most of the remaining land consists of government-owned land and residential development. Current land uses on the Walla Walla River shoreline are summarized below in Exhibit 6-6.

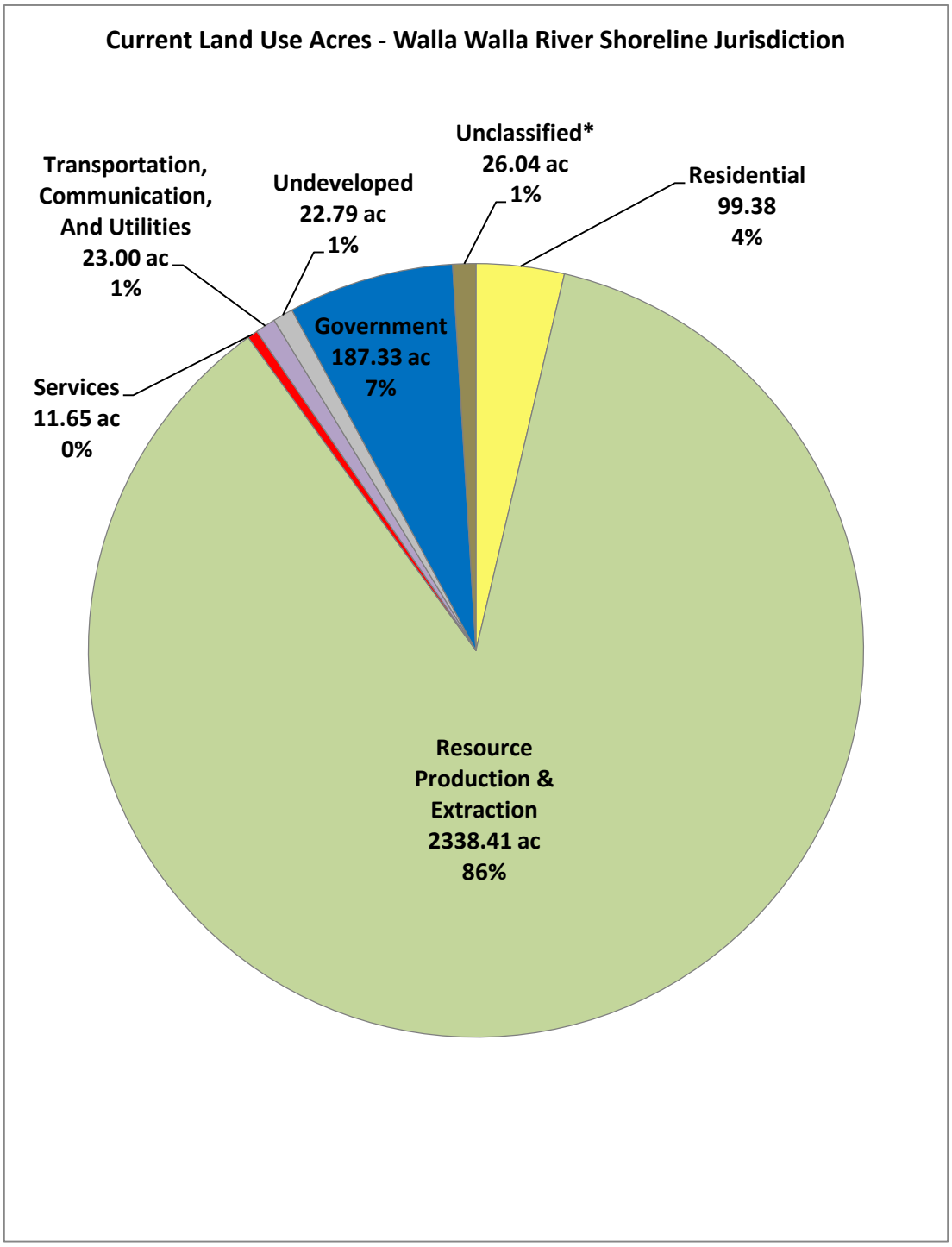


Exhibit 6-6. Current Land Use – Walla Walla River

*Unclassified land represents parcels for which the Walla Walla County Assessor has not assigned a land use category. Review of aerial photography indicates that unclassified lands consist primarily of federally-owned land, Corps-managed dam and flood control projects, and transportation and utility infrastructure.

Source: Walla Walla County Assessor, 2014.

Water-Oriented Uses

Water-dependent uses on the Walla Walla River consist of a boat launch facility at Smith Harbor. Water-related uses include irrigation pumping and diversion structures, and water-enjoyment uses include parks, a boat launch, and trails. Public access to the shoreline is described in Section 6.4.3 below.

Transportation and Utilities

Transportation infrastructure in the Walla Walla River shoreline area includes U.S Highway 12, SR 125, and a variety of county roads and private access roads. U.S. 12 crosses the Walla Walla River at its mouth on the Columbia River, then turns east and crosses the river again approximately 6 miles northwest of Touchet. SR 125 crosses the river south of College Place, approximately 4 miles north of the Oregon state line. County and private roads along the river serve primarily agricultural and low-density residential development.

Railroad infrastructure along the Walla Walla River includes on railroad crossing at the mouth of the River on the Columbia, as well as an east-west Union Pacific line that roughly parallels the river and U.S. 12 through the town of Touchet before eventually arriving in Walla Walla. The east-west rail line remains on the north side of the river and periodically passes in and out of shoreline jurisdiction.

Utilities in the shoreline environment include irrigation structures and piping, as well as water, power, and possibly septic infrastructure serving residences on the shoreline.

6.4.2 Future Land Use

The majority of the Walla Walla River shoreline is zoned Primary Agriculture (40 acres), though Agriculture Residential (10 acres) accounts for roughly one-third of the shoreline environment. Agriculture Residential zoning is concentrated in the upper reaches of the river near Touchet and the City of Walla Walla, while Primary Agriculture is dominant in the lower reaches near the Columbia River. Rural Residential (5 acres) zoning accounts for a small portion of the overall shoreline environment, but it represents a large portion of Reach WW7, located south of College Place and Walla Walla. Exhibit 6-7 shows zoned acres by shoreline reach, as well as the percentage of each reach covered by the various zoning districts.

Exhibit 6-7. Walla Walla River Zoning by Reach

Source: Walla Walla Joint Community Development Agency, 2014.

Vacant parcels along the Walla Walla River total approximately 17 acres, with shoreline jurisdiction covering approximately 8.3 acres. These properties are concentrated in the upper portions of the river (Reaches 5, 6, and 7) and could generate up to 5 new

shoreline residences, though the size of the parcel pattern in this area would provide opportunities for homeowners to construct their residences outside the shoreline jurisdiction, thus reducing this number.

In addition to vacant properties, one residential property in Reach WW5 is capable of being subdivided for further development, providing the potential for one additional residence.

6.4.3 Existing and Potential Public Access

Parks and Open Space

Public access on the Walla Walla River is currently limited due to almost completely private ownership of the adjacent uplands. A large area of federally-owned land is located at the mouth of the river in Smith's Harbor, and Reach WW6 contains a portion of the Whitman Mission National Historic Site, though the site does not offer any formal water access features or facilities. Park and open space acreage by reach are presented below in Table 6-3.

Table 6-3. Parks and Open Space Acres by Reach – Walla Walla River

Reach	Ownership	Acres in Jurisdiction
WW1 – Smith's Harbor	Federal	276.1
WW4 – Lowden	State	13.4
WW6 – Ag/Residential Riparian	Federal	8.3

Source: Walla Walla County Assessor, 2013.

Parks and open space along the Walla Walla River include the following:

- Madame Dorian Memorial Park, operated by the U.S. Fish and Wildlife Service (USFWS). The site includes a boat launch and lawn areas.
- Wallula Habitat Management Unit, operated by the USFWS. Part of the McNary Wildlife Refuge complex, the Wallula Unit offers opportunities for fishing, upland and waterfowl hunting, and equestrian activities.
- Whitman Mission National Historical Site, operated by the National Park Service. The site consists of a visitor center, memorial site markers for the original mission site, and a grave site, though none of these features are located in shoreline jurisdiction. As described above, the site is adjacent to the Walla Walla River, but no formal public access features or facilities are provided.

- An unnamed WDFW-owned open space property, located where McDonald Road crosses the river approximately 6 miles east of Touchet. The property includes a small parking area and a gravel boat launch.

In addition to these parks and publicly-owned properties, WDFW maintains a fishing access point on the river at the confluence with Mill Creek.

Recreation: Boat Launches and Trails

As described above, the Walla Walla River contains two public boat launches, one located at Madame Dorian Memorial Park near the mouth of the river, and another located on the WDFW-owned property in Reach 4. The federally-operated Wallula Habitat Management Unit includes a 4-mile equestrian trail along the north bank of the river.

Future Public Access

Walla Walla County has not historically served as a provider of parks and open space, and the County has not identified future improvements at any shoreline parks. The USFWS conducts ongoing maintenance and improvements of its facilities at the McNary Wildlife Refuge and other habitat management areas. It is anticipated that additional opportunities for improved public access to the shoreline will be identified as part of the SMP planning process.

Potential Population and Future Tourism Demand

Future population growth along the Walla Walla River is likely to be limited due to the prevalence of agricultural zoning and residential zoning district which require large minimum lot sizes. Additional public access demand associated with tourism may occur on the lower reaches of the river, which are closer to regional population centers and where the river is large enough to support fishing and boating activities. These areas are already served by federal facilities, and future improvements would be planned and implemented by the USFWS.

6.4.4 Historic and Archeological Sites

While the land use pattern along the Walla Walla River contains a larger amount of residential uses than some of the smaller streams discussed in this report, it does not pass through any heavily urbanized areas, and it has relatively few documented historic sites. Six sites are currently documented along the Walla Walla River, of which four are bridges, one is a 1930's single-family residence, and one is the Whitman Mission National Historic Site, described in Section 6.4.3 above. The Walla Walla River is regionally significant for agricultural uses, but it does not have a history as a

transportation route that would attract large concentrations of modern human settlement. However, the river historically hosted a spring salmon that could have attracted native peoples, and there is potential for undiscovered archaeological resources in the shoreline environment.

6.5 Touchet River

6.5.1 Current Land Use

Based on Walla Walla County Assessor data for parcels completely or partially located within shoreline jurisdiction, current land use along the Touchet River is overwhelmingly agricultural in nature, represented on Exhibit 6-8 as resource production and extraction. The next largest land use category is residential, which is concentrated in the vicinity of the town of Touchet. Exhibit 6-8 shows a summary of land use categories along the Touchet River.

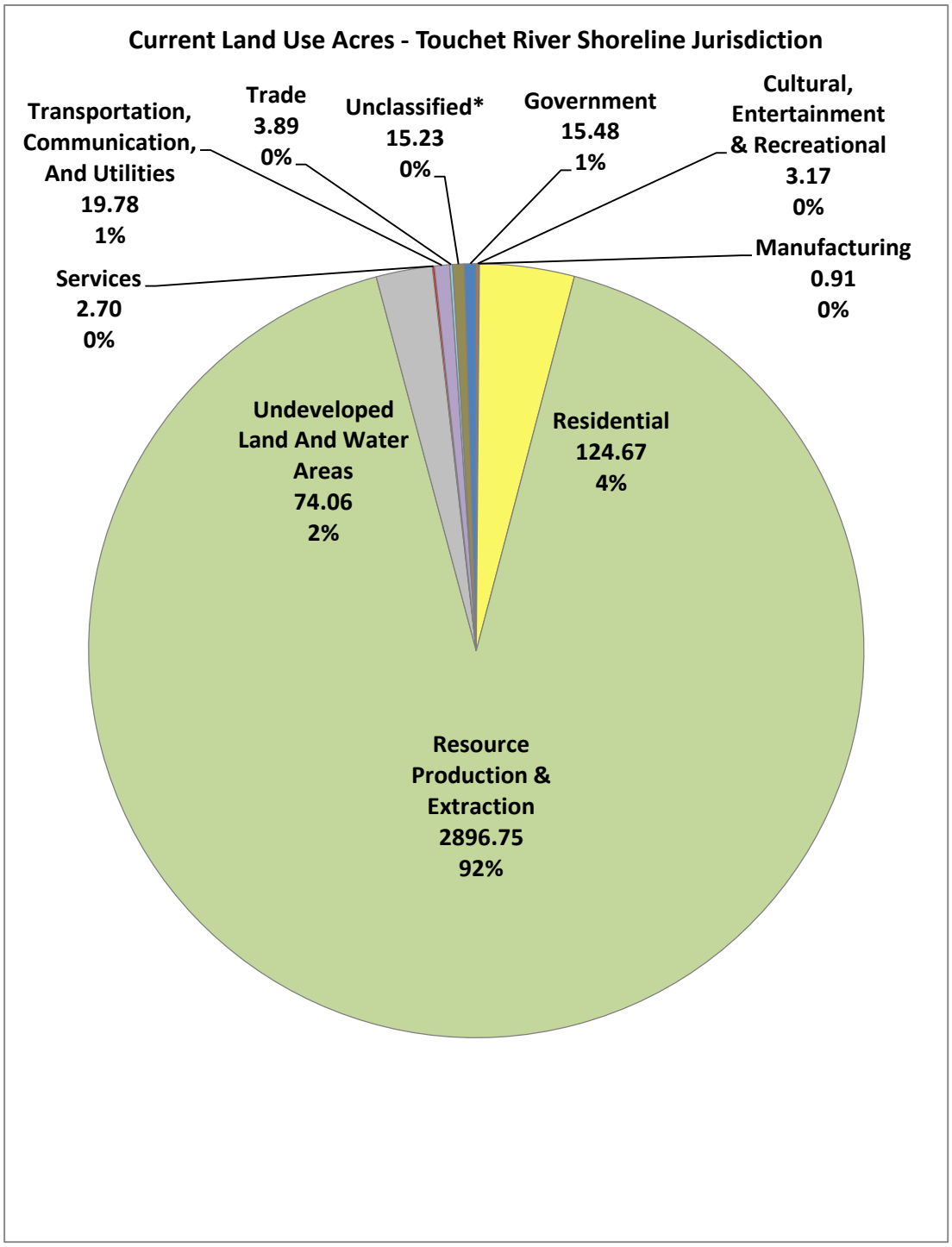


Exhibit 6-8. Current Land Use – Touchet River

*Unclassified land represents parcels for which the Walla Walla County Assessor has not assigned a land use category. Review of aerial photography indicates that unclassified lands consist primarily of federally-owned land, Corps-managed dam and flood control projects, and transportation and utility infrastructure.

Source: Walla Walla County Assessor, 2014.

Water-Oriented Uses

Water-dependent and water enjoyment uses along the Touchet River are limited due to the almost exclusively agricultural nature of the area. Water-related uses include pumping stations and water diversion structures for irrigation.

Transportation and Utilities

Transportation infrastructure in the Touchet River shoreline includes U.S. and State highways, as well as county roads, local city streets, and private access roads. U.S. 12 crosses the river just west of the town of Touchet and crosses it again in Waitsburg. SR 124 parallels the river for approximately 15 miles before crossing it approximately 3 miles west of Waitsburg. SR 125 crosses the river at its junction with SR 124, just west of Prescott. County roads and private roads provide access to agricultural and rural residential development, and local city streets enter the shoreline environment where the river passes through Waitsburg.

A Port of Columbia rail line crosses the river on a small bridge just south of Prescott and roughly parallels the river eastward, periodically entering and leaving the shoreline environment between Prescott and Waitsburg.

Utilities in the shoreline environment consist primarily of agricultural irrigation infrastructure, overhead power transmission and distribution lines, and water lines serving residential development. Some sewer or septic lines may cross the shoreline environment in populated areas, such as Touchet and Waitsburg. The City of Waitsburg Wastewater Treatment Plant, while not located in shoreline jurisdiction itself, discharges its treated effluent to an infiltration wetland that lies partially within shoreline jurisdiction in Reach 5.

6.5.2 Future Land Use

County zoning along the Touchet River is almost entirely Primary Agriculture (40 acres), though the area near the town of Touchet has a concentration of Rural Residential (5 acres) zoning. Exhibit 6-9 shows County zoning acres by reach, as well as the percentage of each reach occupied by each County zoning district.

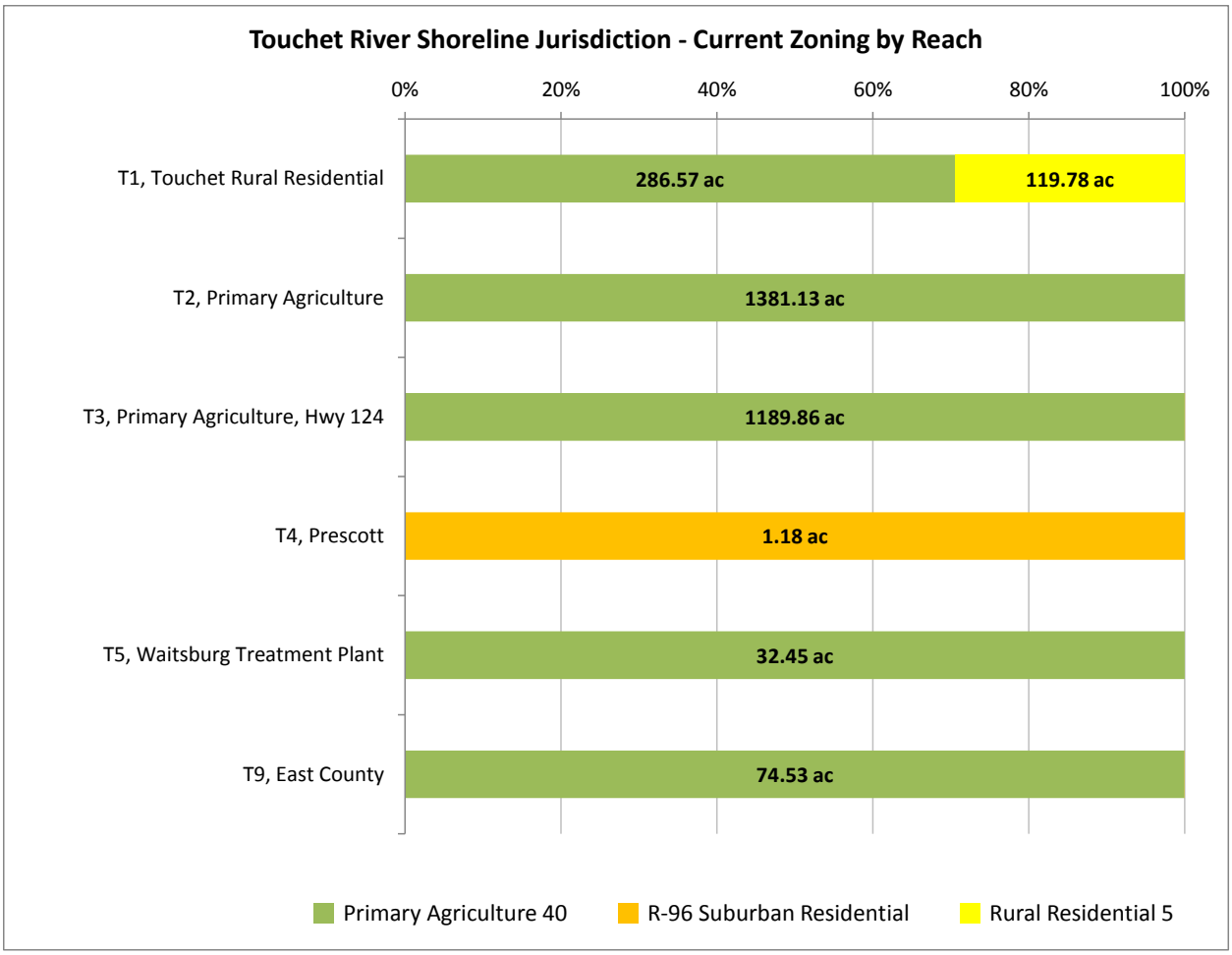


Exhibit 6-9. Touchet River Zoning by Reach

Source: Walla Walla Joint Community Development Agency, 2014.

Reach T3 includes a small area (less than 1 acre) within the Town of Prescott's Urban Growth Area that is zoned Public Reserve, but is otherwise zoned entirely Primary Agriculture (40 acres). Reach T4 consists of areas within the Town of Prescott, where no Town zoning information is currently available. However, County zoning maps show a small area (approximately 1.18 acres) in the eastern portion of the Town limits where a County zoning designation of Suburban Residential is applied. Based on the current land use pattern, this reach is anticipated to remain agricultural in character.

Reaches T5, T6, T7 and T8 are within the City of Waitsburg and have City zoning applied. Shoreline zoning in Waitsburg is primarily Residential, followed by Public Lands and Commercial. The Residential and Commercial zones are designed to accommodate development of those types, and the Public Lands zone is applied to all

areas that are "public" in nature, regardless of whether they are owned by the City or a private owner. The zone is intended to provide for civic facilities, establish the aesthetic image of the city, and protect parks and open space. GIS data for City of Waitsburg zoning was not available as of this writing, but an image of the City's latest zoning map is included for reference in Appendix D. Reach T9 consists of that unincorporated portion of the Touchet River upstream of Waitsburg and is zoned exclusively Primary Agriculture (40 acres).

Vacant properties in the unincorporated county along the Touchet River total approximately 30 acres, of which 16 acres are covered by shoreline jurisdiction. These vacant lots are concentrated near Prescott, Waitsburg, and the town of Touchet. Based on allowed residential densities, these properties could generate up to 20 new shoreline residences, though the number could be lower depending on individual project siting and the amount of each parcel located in shoreline jurisdiction. In addition to vacant properties, two properties in Reach T3 near Prescott zoned for suburban residential development could potentially be subdivided to allow further development. Combined, these two properties could generate up to 62 additional single-family lots, though a relatively small portion of each lot is located in shoreline jurisdiction, so the majority of these new residences would be located upland of the shoreline.

The City of Waitsburg contains 31 vacant shoreline properties along the Touchet River, which could potentially be developed for residential, commercial, or industrial uses. However, the Touchet River has an extensive floodplain in Waitsburg, and flood risks to residents and businesses are high. As a result, FEMA is in the process of a voluntary buy-out of many affected property owners, which is anticipated to limit future development potential in this area.

6.5.3 Existing and Potential Public Access

Most of the land along the Touchet River is in private ownership, and public access is currently limited. The only documented public access point is the city-owned Preston Park in Waitsburg, consisting of approximately 9.6 acres on the south bank of the river. Most of the shoreline is screened by vegetation at this location, but visual and physical access is available. No trails or boat launch facilities are provided.

Future Public Access

Walla Walla County has not historically served as a provider of parks and open space, and the County has not identified any locations on the Touchet River for future acquisition and improvement. The Capital Facilities Element of the City of Waitsburg's

Comprehensive Plan, last updated in 2007, includes a planned trail along the Touchet River levee at a cost of $11,000. No date for construction is provided.

The City of Waitsburg has also planned construction of a new park at the previous site of a Northwest Grain Growers mill on the north side of the Touchet River, known as Rankin Park. Construction is planned for 2014-15.

Potential Population and Future Tourism Demand

Based on the prevailing agricultural land use pattern and zoning, population growth along the Touchet River is anticipated to be modest and concentrated in the communities of Touchet, Prescott, and Waitsburg. Tourism opportunities along the river are likewise limited, and the Touchet is unlikely to experience the same level of tourism-oriented demand for public access as larger rivers, such as the Snake or Columbia.

6.5.4 Historic and Archeological Sites

The City of Waitsburg contains a historic district listed on the National Register of Historic Places, a portion of which lies within shoreline jurisdiction. Historic properties within shoreline jurisdiction include a historic gas station, an American Legion Hall, and International Order of Odd Fellows Hall, a historic auto garage, and the Waitsburg Bridge that crosses the Touchet River. None of these properties are currently listed on the National Register of Historic Places.

The Touchet River is also designated as part of the Lewis and Clark National Historic Trail. While no physical trail facilities are provided for modern hikers, both SR 124 and U.S. 12 are part of the Lewis and Clark Auto Tour Route.

6.6 Mill Creek

6.6.1 Current Land Use

Mill Creek has the most varied land uses of all the SMA-regulated streams in Walla Walla County. It is the most urbanized of the streams, even conveyed underground through downtown Walla Walla, but it also includes very rural areas east and south of the city as it crosses into Oregon. Resource production and extraction is the majority use, but residential uses account for approximately 21% of the shoreline acreage. These uses dominate in the area west of the City of Walla Walla, transitioning to more intense uses within the city (manufacturing, commercial, higher-density residential). East of Walla Walla, uses again become more rural. These areas are characterized by agriculture and undeveloped land, though pockets of rural residential uses exist, such as Kooskooskie Commons.

Existing land uses along Mill Creek are summarized in Exhibit 6-10 below.

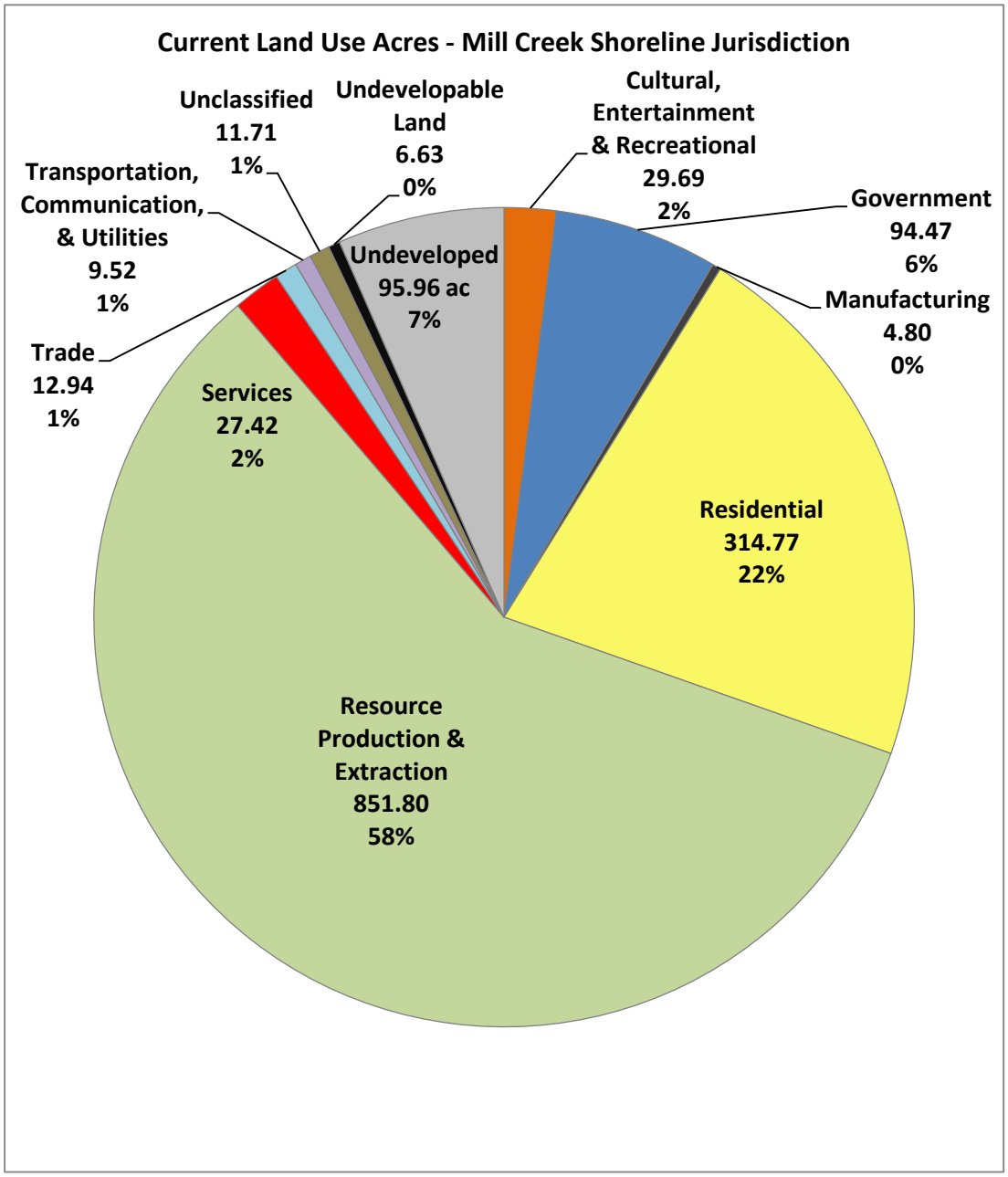


Exhibit 6-10. Current Land Use – Mill Creek

*Unclassified land represents parcels for which the Walla Walla County Assessor has not assigned a land use category. Review of aerial photography indicates that unclassified lands consist primarily of federally-owned land, Corps-managed dam and flood control projects, and transportation and utility infrastructure.

Source: Walla Walla County Assessor, 2014.

Water-Oriented Uses

Water-dependent uses on Mill Creek include stormwater outfalls in urbanized areas (Walla Walla and College Place UGA). The U.S. Army Corps of Engineers also maintains a flood control diversion dam in Reach MC12. This dam regulates water levels in Bennington Lake to the south and prevents flooding of downtown Walla Walla.

Water-enjoyment uses include several parks and open space areas, which are described in detail in Section 6.6.4.

Due to the urbanized nature of Mill Creek's shorelines in the Walla Walla area, a number of non-water oriented uses, such as commercial and manufacturing uses, are also present.

Transportation and Utilities

Transportation infrastructure in the Mill Creek shoreline environment includes U.S. and state highways, county roads, local city streets, and private access roads. The largest concentration of transportation infrastructure is in the City of Walla Walla and the immediately surrounding areas. A major interchange of U.S. 12 and SR 125 is located in northwestern Walla Walla, and SR 125 crosses the creek near the western city limits. Stream crossings in Walla Walla are generally limited to highways, railroad bridges, and major arterial streets. Crossings by local circulation streets, while providing access to development in the shoreline environment, are limited, except in the downtown area, where the stream has been routed underground. Outside Walla Walla, transportation infrastructure on Mill Creek is limited to county roads and private access roads.

Mill Creek has two railroad crossings: one near its mouth on the Walla Walla River and another in northwestern Walla Walla, where two rail lines merge and cross the creek south of the U.S. 12/SR 125 junction. These lines travel north, providing rail access to Prescott, Waitsburg, and communities in Columbia County.

Utilities in the Mill Creek shoreline environment include major urban utilities, such as electric power, water, and sewer lines. In rural portions of the shoreline environment, utilities consist of overhead power lines, irrigation intake structures, and possibly water lines serving rural residential development.

6.6.2 Future Land Use

As shown in Exhibit 6-1 and 6-12, zoning along Mill Creek is diverse, including both County and City zoning districts to accommodate both rural and urban development

patterns. The largest zoning category is Rural Residential – Mill Creek (5 acres), concentrated in the stretch of the creek immediately west of Walla Walla. Rural Remote (40 acres) zoning accounts for approximately 21% of the shoreline acres; this district is concentrated in the southeastern portion of the county and is intended for remote areas where county services are limited or unavailable. Agriculture Residential (10 acres) zoning, intended to accommodate agricultural, residential, and limited tourism uses, accounts for 17% of the shoreline acreage and is concentrated on the portion of the creek west of Walla Walla and College Place near the confluence with the Walla Walla River. Walla Walla County zoning districts are summarized in Exhibit 6-1, and City of Walla Walla zoning districts are summarized in Exhibit 6-2.

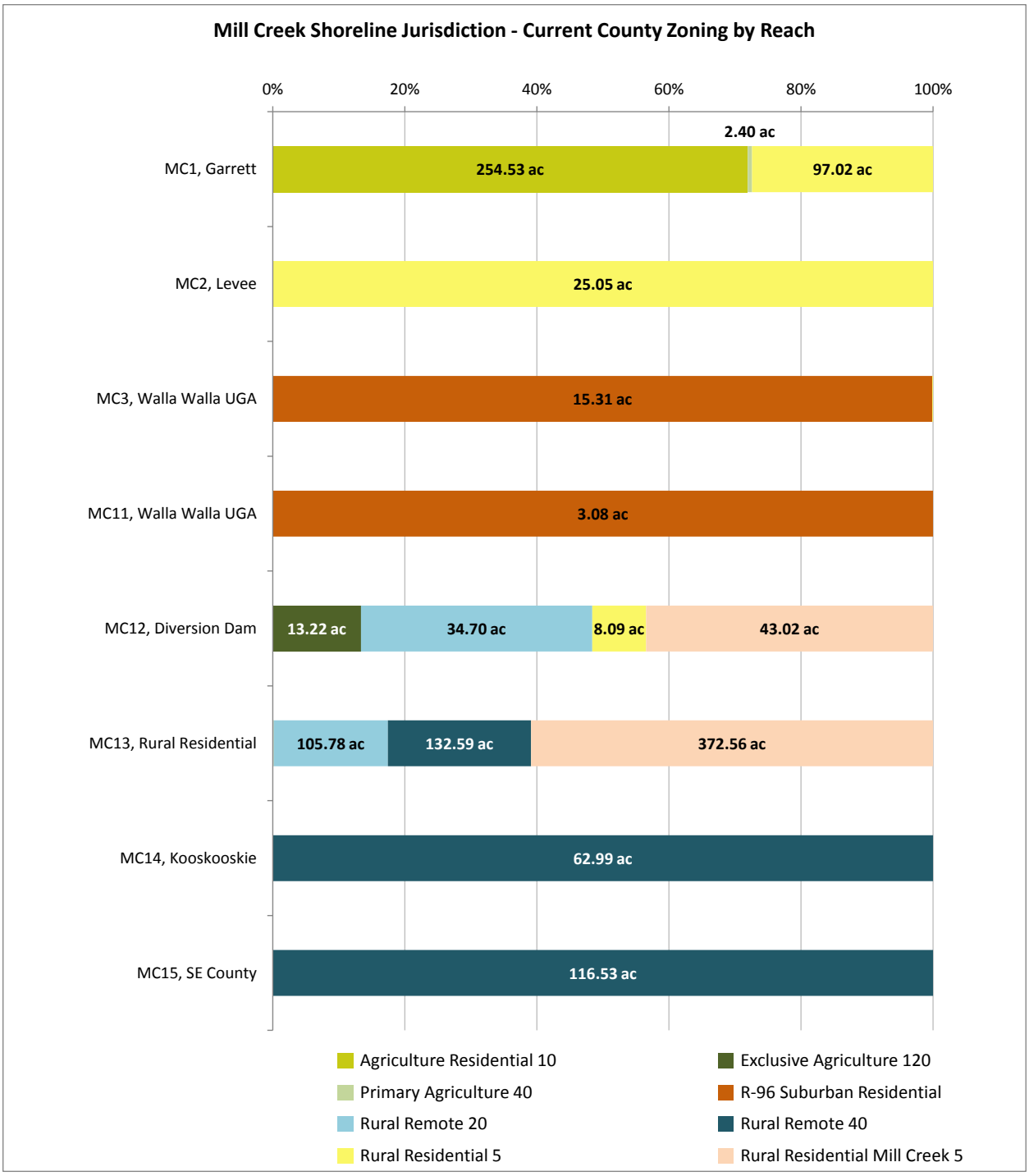


Exhibit 6-11. Mill Creek Walla Walla County Zoning by Reach

Source: Walla Walla Joint Community Development Agency, 2014.

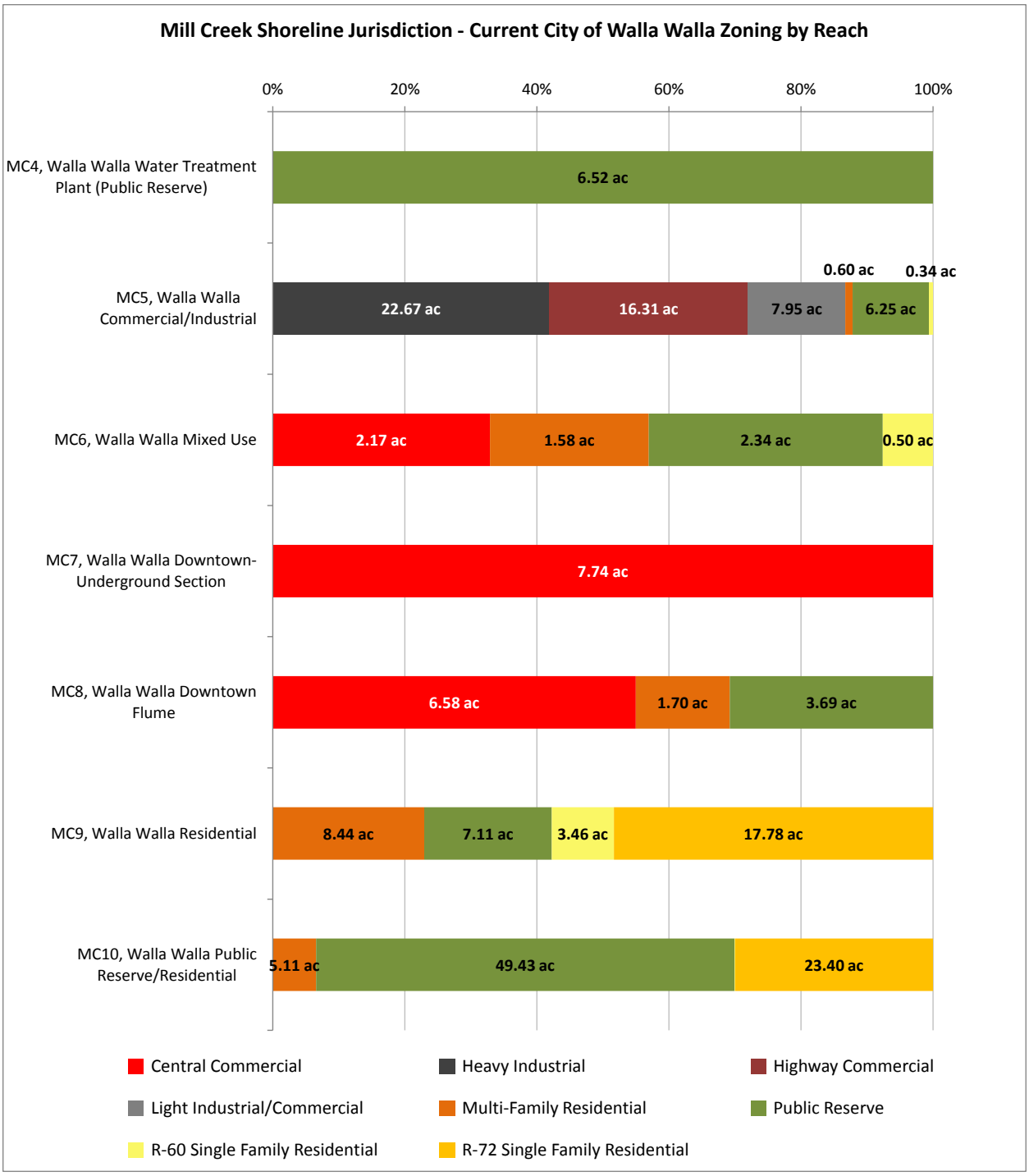


Exhibit 6-12. Mill Creek City of Walla Walla Zoning by Reach

Source: Walla Walla Joint Community Development Agency, 2014.

Due the urbanized nature of much of its shoreline, Mill Creek has the highest potential for additional development in the shoreline environment. Vacant parcels along Mill Creek comprise approximately 211 acres, with 85 acres covered by shoreline jurisdiction. As discussed above, zoning varies from reach to reach, and vacant properties could be developed with a mix of single-family residential, multifamily residential, commercial, and industrial uses.

Based on allowed residential densities, it is estimated that future development on shoreline parcels could result in up to 80 new residences, concentrated mostly in the City of Walla Walla. In areas outside the city, the number of residences located in shoreline jurisdiction is likely to be greatly reduced due to larger parcel sizes that allow for more flexibility in building siting. In Walla Walla, the smaller lot size pattern would result in a larger proportion of these residences being located in shoreline jurisdiction.

In addition to vacant properties, 44 residential parcels on Mill Creek are large enough to be subdivided, based on applied zoning requirements, thus potentially generating additional residences. As with vacant properties, most of these lots are concentrated in Walla Walla. Based on minimum parcel sizes for adopted residential zoning, subdivision of these properties could result in the creation of up to 169 new lots, of which approximately 59 would be covered by shoreline jurisdiction. The precise number of new shoreline residences from subdivision would depend on lot and access road configuration, as well as market factors, potentially reducing this number.

Vacant properties along Mill Creek zoned for commercial and industrial uses could also experience future development, increasing the intensity of shoreline land use conditions. Potential commercial and industrial development was estimated based on observed FAR values for comparably zoned developed properties; as a general rule, FAR values for particular development types in urban areas were higher than their rural counterparts. Based on this information, it is estimated that future development of vacant properties on Mill Creek could generate up to 137,600 square feet of commercial and industrial space in shoreline jurisdiction. Most of this development potential is concentrated in western Walla Walla, in Reach MC5.

6.6.3 Shoreline Permit History

Due to the rural nature of most of Walla Walla County, relatively few shoreline permits have been issued in recent years. Records provided regarding shoreline permit history cover a limited timeframe and provide limited information regarding the location or precise nature of the permitted shoreline activity. For example, during the period 2008-2010, Walla Walla County issued 18 shoreline permits. However, no information is

currently available regarding the precise nature of the activities permitted or their locations. Due to the narrow period of time these records cover and wide variation in activity each year, it is difficult to extrapolate any sort of trend.

Permitting history for Mill Creek within the City of Walla Walla is summarized below. During the period 2006-2013, the City of Walla Walla issued 14 shoreline permits and two shoreline exemptions. These permits included a multifamily residential project, several commercial/industrial structures, transportation projects, and a wastewater treatment plant. Both shoreline exemptions were related to fish passage improvement projects on Mill Creek.

6.6.4 Existing and Potential Public Access

Parks and Open Space

Existing public access on Mill Creek consists of a mix of federal land, city parks, and school district facilities. Park and open spaces acreages by reach are summarized in Table 6-4.

Table 6-4. Parks and Open Space Acres by Reach – Mill Creek

Reach	Ownership	Acres in Jurisdiction
M1 – Garrett	Federal	23.8
M5 – Walla Walla Commercial/Industrial	City	3.1
M8 – Walla Walla Downtown Flume	City	0.8
M9 – Walla Walla Residential	City	3.1
M10 – Walla Walla Public Reserve/Residential	Federal School District City	5.2 0.2 25.8
M12 – Diversion Dam	Federal	72.9
M15 – Southeast County	Federal	116.5

Source: Walla Walla County Assessor, 2013.

Parks on Mill Creek include the following:

- Whitman Mission National Historical Site, operated by the National Park Service. The site consists of a visitor center, memorial site markers for the original mission site, and a grave site, though none of these features are located in shoreline jurisdiction. The site is adjacent to both Mill Creek on the north and the Walla Walla River on the south, but no formal public access features or facilities are provided.
- Washington Park, owned and maintained by the City of Walla Walla. The park covers 12 acres and includes picnic areas, play equipment, basketball courts, soccer fields, a performance stage, and walking paths.

- Wildwood Park, owned and maintained by the City of Walla Walla. The park covers 6 acres and includes play equipment and a picnic shelter building.
- Eastgate Lions Park, owned and maintained by the City of Walla Walla. The park covers 12 acres and includes play equipment, a picnic shelter, and a basketball court. The park is also the western terminus for the Mill Creek recreation trail.
- Mill Creek Sports Complex, owned and operated by the City of Walla Walla. The sports complex covers 50 acres and provides two soccer fields and three lighted softball fields. The park is heavily used due to adult and youth league play.
- Heritage Square is owned and operated by the City of Walla Walla. The park is located on Main Street in downtown Walla Walla, between Spokane and Colville Streets. A picnic shelter, playground equipment, and restrooms are available.
- Mill Creek/Bennington Lake Recreation Area, managed by the U.S. Army Corps of Engineers. This recreation area includes both Rooks Park on Mill Creek and Bennington Lake to the south, described in Section 6.8. Rooks Park includes group picnic areas with shelters, a playground, shower facilities, and access to shoreline trails that connect to Bennington Lake.

Recreation: Boat Launches and Trails

No boat launch facilities are available on Mill Creek.

Trails on Mill Creek include the following:

- Mill Creek Recreation Trail – A paved trail for pedestrians and bicyclists that follows the Mill Creek from the City of Walla Walla's Eastgate Lions Park to the Corps-maintained Rooks Park at the Mill Creek diversion dam.
- Bennington Lake Recreation Area Trail System – The Bennington Lake Recreation Area is located primarily around Bennington Lake, but includes areas along Mill Creek and provides access to a network of pedestrian, bicycle, and equestrian trails, including the following:
    - Kingfisher Trail (1.7 miles)
    - Meadowlark Trail (2.6 miles)
    - Whitetail Trail (4.8 miles)

Future Public Access

Walla Walla County has not historically served as a provider of parks and open space, and the County has not identified future improvements at any shoreline parks. The Corps conducts ongoing maintenance and improvements of its facilities at the Bennington Lake Recreation Area. The City of Walla Walla conducts ongoing maintenance at its parks, but no shoreline park improvements have been identified for the foreseeable future.

Several private developments are underway along the Mill Creek shoreline in downtown Walla Walla that will provide public access. The recently completed Vue 22 condominium development includes a walking path along the creek, and a new Courtyard Marriott hotel is under construction that will also provide public creek access.

It is anticipated that additional opportunities for improved public access to the shoreline will be identified as part of the SMP planning process.

Potential Population and Future Tourism Demand

Mill Creek is the most urbanized stream in Walla Walla County and passes through the county's largest population center. Future population growth in the Walla Walla area is likely to drive additional demand for public access, as is Walla Walla's role as a center of regional wine and arts tourism, which is likely to continue for the foreseeable future. Aside from the public parks and open space already identified on Mill Creek, the majority of remaining shoreline land is privately owned, making the development of new public access locations challenging. Future demand for public access to the shoreline is therefore likely to take the form of increased use of existing shoreline parks and open space areas.

6.6.5 Historic and Archeological Sites

The shoreline jurisdiction of Mill Creek has approximately 100 documented historic sites, the greatest amount of all the SMA water bodies in Walla Walla County. Nearly all of these historic properties are located in the City of Walla Walla, where Mill Creek passes through the city's downtown. The City of Walla Walla is the largest population center in the county and has been a crossroads of the region for centuries, serving as a traditional gathering place for native peoples and later as a military outpost after Euro-American settlement of the area. Walla Walla boomed in the late 1800's and early 1900's as wheat farming expanded in the surrounding countryside, and the city's downtown area retains many buildings from that time period. A number of these historic properties are listed on the National Register of Historic Places, including the Walla Walla Post

Office, the Electric Light Works Building, the Marcus Whitman Hotel, and the Liberty Theater.

Outside the City of Walla Walla, historic sites on Mill Creek include, but are not limited to, the following:

- Swengle Road Bridge, located approximately one-half mile northeast of Mill Creek's discharge to the Walla Walla River.
- The Whitman Mission National Historic Site, located approximately 6 miles west of Walla Walla on U.S. 410.
- Mill Creek Diversion Works Dike, located northeast of Walla Walla at the diversion channel from Mill Creek to Bennington Lake.
- Upper Mill Creek Dam, located in the far southeast portion of Mill Creek Reach 14, just north of the Oregon State Line.

6.7 Yellowhawk Creek

6.7.1 Current Land Use

Based on Walla Walla County Assessor data for parcels completely or partially located within shoreline jurisdiction, the Yellowhawk Creek shoreline is characterized primarily by resource production and extraction uses, mostly in the form of agriculture. The other major land use category is residential development, representing approximately one-quarter of the jurisdiction acreage. Current land use on Yellowhawk Creek is summarized in Exhibit 6-3.

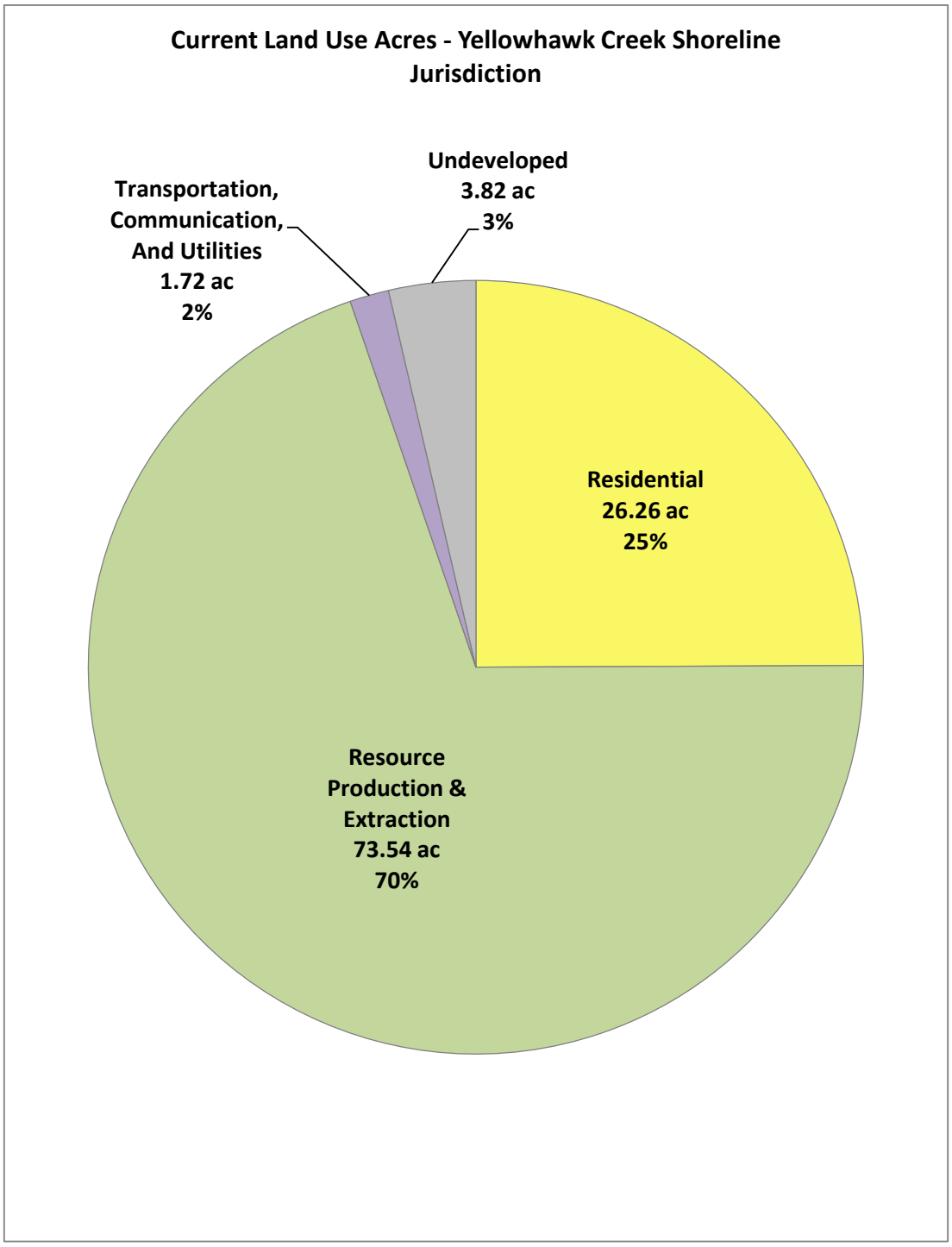


Exhibit 6-13. Current Land Use – Yellowhawk Creek

Source: Walla Walla County Assessor, 2014.

Water-Oriented Uses

Water-oriented uses on Yellowhawk Creek consist primarily of water diversion structures for irrigation and drainage channels from agricultural fields. No dams, docks, boat-launches, or parks are present on this portion of the creek.

Transportation and Utilities

Transportation infrastructure in the vicinity of Yellowhawk Creek includes one state highway, several county roads, and a number of private access roads. SR 125 and Old Milton Highway are the two major thoroughfares in the area, and both cross Yellowhawk Creek via vehicular bridges.

Utilities along Yellowhawk Creek include the following:

- Electrical power transmission lines along roads, specifically SR 125 and Old Milton Highway, where they cross the creek.
- Electrical power distribution lines to residential development along the creek.

6.7.2 Future Land Use

County zoning along Yellowhawk Creek consists of Rural Residential and Agricultural Residential districts, as described below:

- Rural Residential (5 acres) – Intended to accommodate large-lot rural residential development, this zoning district covers 96.45 acres (89%) of the reach.
- Agriculture Residential (10 acres) – Intended to accommodate agricultural, residential, and limited tourism uses, this zoning district covers 12.45 acres (11%) of the reach.

Exhibit 6-104 summarizes the zoning districts present on Yellowhawk Creek, including the percentage of the reach covered by each zoning district.

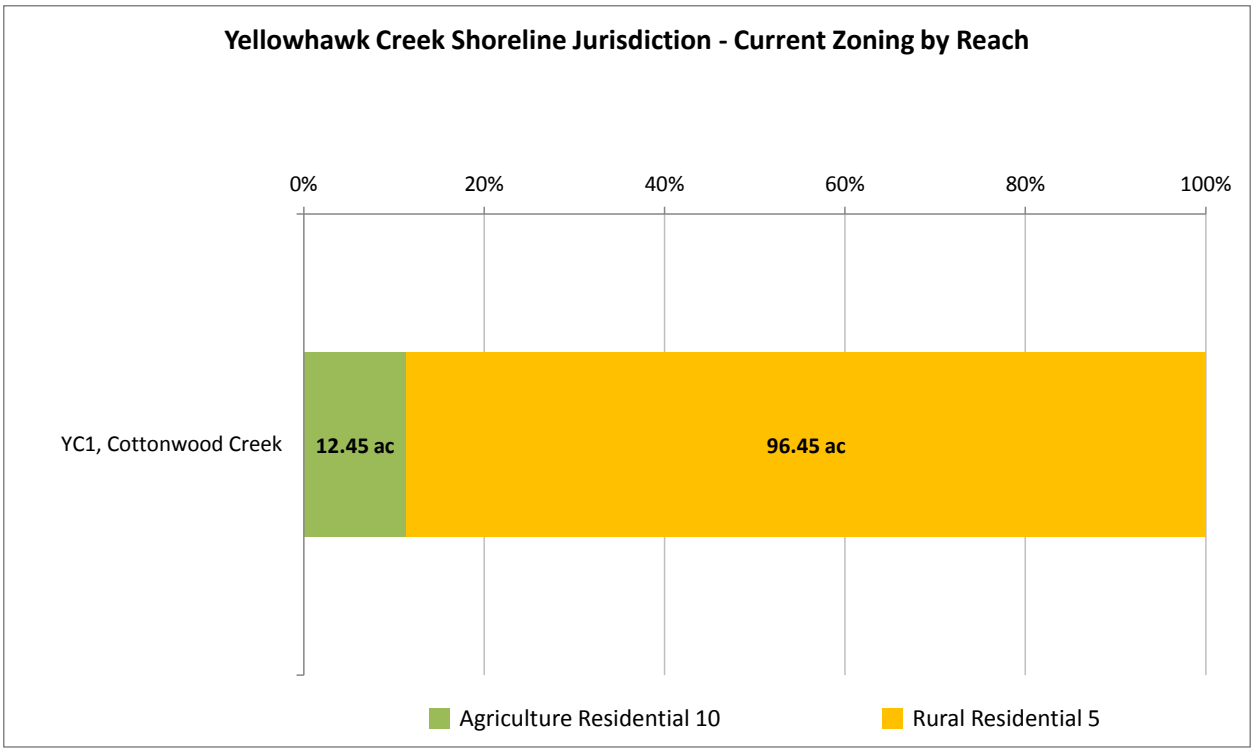


Exhibit 6-104. Yellowhawk Creek Zoning by Reach

Vacant properties along Yellowhawk Creek comprise approximately 18 acres, of which approximately 4 acres are covered by shoreline jurisdiction. These properties could generate up to 9 new residences, though most of these properties have less than an acre of area within shoreline jurisdiction. As a result, most of these new residences are not likely to be located in shoreline jurisdiction.

6.7.3 Existing and Potential Public Access

Land ownership along the regulated portion of Yellowhawk Creek is entirely private, with the exception of approximately 1.1 acres at the southwestern corner of the intersection of Old Milton Highway and SR 125, which are owned by the State and are currently undeveloped. While this land could potentially be used to provide access to Yellowhawk Creek, immediately south of the property, the site is constrained by its narrow configuration located adjacent to a five-lane highway.

No parks, dedicated open space, boat launches, or trails are currently present on Yellowhawk Creek. The creek bank is heavily vegetated along most of its length, and the creek offers few recreational opportunities. No significant increase in demand for public

access along Yellowhawk Creek is anticipated in the foreseeable future, and the County has planned no public access improvements for this stream.

6.7.4 Historic and Archeological Sites

Yellowhawk Creek is a relatively small stream, and, as a non-navigable waterway, the presence of cultural resources is less likely than along larger water bodies, such as the Columbia or Snake Rivers. No historic or archaeological sites have been documented in the vicinity of Yellowhawk Creek.

7 SHORELINE MANAGEMENT RECOMMENDATIONS

The following are recommended actions for translating inventory and characterization findings into the draft SMP policies, regulations, environment designations, and restoration strategies for areas within shoreline jurisdiction. In addition to the following analysis-specific recommendations, the updated SMP(s) will incorporate all other requirements of the Shoreline Management Act (RCW 90.58) and the Shoreline Master Program Guidelines (WAC 173-26).

7.1 Environment Designations

As outlined in WAC 173-26-191(1)(d), "Shoreline management must address a wide range of physical conditions and development settings along shoreline areas. Effective shoreline management requires that the shoreline master program prescribe different sets of environmental protection measures, allowable use provisions, and development standards for each of these shoreline segments." In WAC 173-26-211(2)(a), the Guidelines further direct development and assignment of environment designations based on "existing use pattern, the biological and physical character of the shoreline, and the goals and aspirations of the community as expressed through comprehensive plans…"

It is difficult to describe a methodology for environment designation recommendations as there are very few firm rules. In general, the environment designation purpose and criteria will be utilized and further informed by the findings of this *Shoreline Analysis Report*, including the following GIS data:

- Current land use
- Planned land use

- Ownership
- Wetlands
- Floodplains
- Vegetation
- Impervious surface
- Ecological functions (as described in this report)

While current and future land use designations provide the basic context for a given segment of land, recommended environment designations will not always correlate strongly with those parameters, particularly on currently undeveloped shoreline areas and shoreline areas with extensive critical areas (e.g., wetlands, floodways, channel migration zones, other geologically hazardous areas). This may also be the case where parcels are large, and extend well beyond shoreline jurisdiction. For example, while the current land use code may indicate a single-family residential land use designation, the actual existing use may not be in shoreline jurisdiction and a more conservative designation could be appropriate to correspond with existing conditions in shoreline jurisdiction.

In the above situations, vegetation (including identification of wetlands) and impervious surface data, as well as the ecological function results, may provide better indicators of the existing alteration level in shoreline jurisdiction. For this reason, all or portions of parcels that have a current or planned land use designation of residential (or other designation allowing alteration) may ultimately have a more protective shoreline environment designation if the ecological functions are considered high and examination of aerial photos and specific data layers provides additional support. In these cases, the parcels can still accommodate the existing or planned uses, perhaps even in shoreline jurisdiction, and satisfy the WAC requirements for consistency between the environment designations and the Comprehensive Plans (see WAC 173-26-211(3) for additional detail about consistency requirements).

In more developed areas, current land use designation will be more strongly correlated with level of alteration and the resulting environment designation. In these areas, often the entire parcel or a large portion of the parcel is in shoreline jurisdiction, and the allowed level of development may already have occurred

The County's current Shoreline Management Master Plan utilizes a system of four environment designations: Urban, Rural, Conservancy, and Natural. Similarly, the cities of Walla Walla and Waitsburg also use the same designation system.

- Urban: The Urban environment is an area of high intensity land-use including residential, commercial, recreational and industrial development. It is particularly suitable to those areas presently subjected to extremely intensive use pressure, as well as areas planned to accommodate urban expansion, primarily utilized in the cities of Walla Walla and Waitsburg.

- Rural: The Rural environment is intended for those areas characterized by intensive agriculture and recreational uses and those areas having a high capability to support active agricultural practices and intensive outdoor recreational development. This applies to most of the unincorporated areas of the County with ongoing uses.

- Conservancy: The Conservancy environment is intended for very low intensity land uses and larger acreages with relatively low land values.

- Natural: The Natural environment is characterized by the presence of some unique natural or cultural features considered valuable in their natural or original condition which are relatively intolerant of intensive human use.

The County's shoreline environment designation map has not been modified since it was originally developed in the mid-1970s, and thus the environment designation assignments no longer provide the best fit with the existing biological and land use character and are not compatible with current digital formats.

The Guidelines recommend use of six unique environments: Aquatic, Natural, Urban Conservancy, Rural Conservancy, Shoreline Residential, and High Intensity. Urban Conservancy, Shoreline Residential, and High Intensity are each intended by the Guidelines to be applied only in Cities and Towns, UGAs, and intensely developed rural areas. However, each jurisdiction may use "alternative" environment designations, as appropriate, as long as they provide equal or better protection than the standard.

The findings of this Analysis Report would support development of several alternative designations to supplement the Guidelines system as follows:

- Consider development of a specific "Rural Industrial" designation to allow for special consideration of the unique water-oriented industrial, commercial, transportation, and power production developments on both the Snake and Columbia Rivers.

- Consider development of an "Agriculture" designation to accommodate unique agricultural industrial activities (e.g. diversions), as well as recognize the community's economic and cultural connection to this important land use.
- Consider development of a "Flood Control" designation for Mill Creek in the City of Walla Walla to simplify development of unique standards and allowed uses that may be appropriate in this distinct and highly altered environment.
- The County and cities are required to include an Aquatic environment designation for areas below the OHWM. Per the Guidelines, the purpose is to "protect, restore, and manage the unique characteristics and resources of the areas waterward of the ordinary high-water mark."

The County and Cities should consider how to designate any potentially associated wetlands, especially any associated wetlands which extend beyond the minimum 200-foot shoreline jurisdiction. Some options include applying a universal shoreline environment designation (e.g. Conservancy or Natural) to all associated wetlands or applying the shoreline environment designation which is immediately adjoining the wetland

7.2 General Policies and Regulations

7.2.1 Archaeological and Historic Resources

- The findings of this Shoreline Analysis Report do not suggest a need for additional regulations beyond those mandated by the SMP Guidelines.

7.2.2 Critical Areas

- The County and Cities should consider whether their critical areas regulations should be incorporated into the SMP by reference or through direct inclusion. Either method of incorporation will require modification of the County's and Cities' critical areas regulations to different degrees as they apply in shoreline jurisdiction to meet SMA criteria. For example, any exceptions, such as reasonable use, will need to be removed as the appropriate SMA process for such action is through the Shoreline Variance.
- The County and Cities will need to evaluate whether the existing critical area buffer protections are sufficient to protect their functions and values and achieve no net loss.
    - In the County, critical areas regulations establish recommended buffers for most shoreline streams of 100 feet. Yellowhawk Creek between the Walla Walla River and Cottonwood Creek has a 50-foot buffer.

    - The City of Walla Walla's regulations require a 35-foot buffer on Mill Creek between Gose St. and the Bennington Lake diversion dam.
    - The City of Waitsburg's regulations require a 25-foot buffer on the Touchet River.
    - The City of Prescott critical area regulations were not available for review at this time.
- Overall, these regulations will need to be revisited to assess if changes are needed to recognize existing shoreline conditions and to accommodate water-oriented and other preferred uses consistent with no net loss of ecological functions (as required by WAC 173-26-221(2)(a)(ii)). In particular, the existing stream buffers are not environment designation- or waterbody-based, which indicates that they may need to be further customized to accomplish these objectives.
- Wetlands regulations will need to be reviewed carefully to ensure consistency with the latest Ecology guidance.

7.2.3 Flood Hazard Reduction

- Several areas have experienced severe floods in the past. Consistent with the WAC provisions in the Guidelines, the SMP(s) should provide flexibility for developing and maintaining flood hazard reduction measures as needed to continue protection of existing uses. Emphasis should be given to maintaining existing ecological functions, at a minimum, through Ecology's no net loss criteria.

7.2.4 Public Access

- The majority of public shoreline access across Walla Walla County is provided and managed by a variety of entities, including the U.S. Army Corps of Engineers, USFWS, Port of Walla Walla and the Washington Department of Fish and Wildlife.
- Walla Walla County has not historically served as a provider of parks and open space, and the County has not identified future improvements at any shoreline parks. It is anticipated that any additional opportunities for improved public access to the shoreline will be identified as part of the SMP planning process.
- The County and Cities should consider providing policies and regulations that:
    - recognize and facilitate implementation of existing parks, recreation, and open space plans (e.g. the City of Waitsburg's plan to construct Rankin Park along the north side of the Touchet River);

- provide public access, as feasible and where public safety would allow, in new commercial, industrial and multi-family development as well as any future publicly sponsored or financed utility and flood control facilities;
- recognize informal shoreline access points (e.g. fishing access at southern portion of Columbia River) and attempt to create formal public access opportunities that address these needs and prevent improper use of the shoreline that may interfere with adjacent uses; and
- promote visual access where physical access is not feasible.

7.2.5 Shoreline Vegetation Conservation

- As noted above under Critical Areas, the County and Cities should review the existing protections provided in the critical areas regulations, paying special attention to measures that will promote retention of shoreline vegetation, replacement of invasive vegetation with native vegetation, and development of a well-functioning shoreline which provides both physical and habitat processes.
- Consider development of specific buffer and/or setback strategies that meet requirements for environmental protection and recognition of local conditions. These may include variations between County/City-specific areas, environment designations, and/or waterbodies.
- Ensure that vegetation provisions allow for appropriate modifications to accommodate preferred uses, particularly important agriculture modifications, water-dependent or –related port developments, other water-oriented uses, and public access and recreation.

7.2.6 Water Quality, Stormwater, and Nonpoint Pollution

- As noted in several waterbodies throughout the County (e.g. Snake River, Touchet River, Mill Creek), water quality parameters such as bacteria levels, pH, temperature, and dissolved oxygen, are exceeding State standards. The County and Cities should consider incorporating regulations to facilitate maximum implementation of TMDL plans, and controlling introduction of 303(d)-listed pollutants for which TMDLs have not yet been prepared.
- Consider adding clarifying statements noting that the policies of the SMPs are also policies of the comprehensive plans and that the policies also apply to activities outside shoreline jurisdiction that affect water quality within shoreline jurisdiction. However, the regulations apply only within shoreline jurisdiction.

7.3 Shoreline Modification Provisions

7.3.1 Shoreline Stabilization

- The presence of existing stabilization related to transportation infrastructure (e.g. railroads and highways) or existing water-dependent uses will continue to be maintained in the years ahead. For the updated SMPs, ensure that proper reference is given to appropriate exemptions found in the WAC related to "normal maintenance and repair." These are not exemptions from the regulations, however; they are exemptions from a Shoreline Substantial Development Permit.
- Ensure "replacement" and "repair" definitions and standards are consistent with WAC 173-26-231(3)(a). Repair activities should be defined to include a replacement threshold so that applicants and staff will know when "replacement" requirements need to be met.
- The County and Cities should include policies and regulations which promote "soft" over "hard" shoreline stabilization measures. Incentives should be included in the SMP that would encourage modification of existing armoring, where feasible, to improve habitat while still maintaining any necessary site use and protection.
- Consider requiring a Conditional Use Permit for any new hard shoreline stabilization, at least in certain environment designations.

7.3.2 Piers and Docks

- There do not appear to be any private residential pier or dock structures in Walla Walla County which are associated with boat moorage. If that is the case, standards for such residential moorage structures may not be needed.
- Overwater structures associated with residential uses, which are used for viewing or other recreational access, such as swimming and fishing, are present along various waterbodies, including upper Mill Creek (e.g. Kooskooskie Commons). The County (and Cities, if appropriate), should consider providing dimensional requirements, if allowed.
- For other types of uses, such as commercial, industrial, and public recreational, it may not be appropriate to have defined dimensional requirements but rather standards which emphasize that these uses should rely on mitigation sequencing to develop an appropriate design.
- Similar to the recommendation under Shoreline Stabilization, the County (and Cities, if appropriate) should ensure repair activities are defined to include a

replacement threshold so that applicants and staff will know when "replacement" requirements need to be met.

7.3.3 Fill

- Restoration fills can benefit shoreline functions and should be encouraged, including improvements to shoreline habitats, material to anchor LWD placements, and as needed to implement shoreline restoration. For example, the filling of rip-rapped shoreline areas along the Snake River with previously dredged material to fill interstitial spaces often used by non-native fish species which prey on juvenile salmon.
- Fills waterward of the OHWM to create developable land should be prohibited.

7.3.4 Breakwaters, Jetties, Groins and Weirs

- Breakwaters, jetties and groins are not prevalent in Walla Walla County. The County and Cities could consider prohibiting new breakwaters, jetties, and groins, except where they are essential to restoration or maintenance of existing water-dependent uses.
- Weirs have been commonly used in many streams and small rivers in the County to control stream flow and improve fish passage, including use by the Walla Walla County Conservation District. As such, the County and Cities should consider continuing to allow the use of weirs for such purposes.

7.3.5 Dredging and Dredge Material Disposal

- In the County, dredging to maintain active navigation channels, moorage facilities, and docking areas, is expected to continue. The County should consider providing standards as necessary so these activities can continue.
- As noted above under "Fill," the re-use of dredge material along the Snake River for the purposes of filling interstitial spaces in rip-rapped shorelines should be allowed.
- Except for purposes of shoreline restoration, flood hazard reduction, and maintenance of existing legal moorage and navigation, the Cities should consider prohibiting these modifications.

7.3.6 Shoreline Habitat and Natural Systems Enhancement Projects

- Consider incentives to encourage restoration projects, particularly in areas identified as having lower function. For example, allow modification of impervious surface coverage, density, height, or setback requirements when paired with significant restoration. Emphasize that certain fills, such as

streambed gravels or material to anchor logs, can be an important component of some restoration projects.

7.4 Shoreline Uses

7.4.1 Agriculture

- Maintenance of existing agriculture is commercially and culturally important to Walla Walla County. This should be recognized in shoreline policies.
- The findings of this Shoreline Analysis Report do not suggest a need for additional regulations beyond those mandated by the SMP Guidelines.
- Given the prevalence of agricultural uses, the County and Cities should consider allowing low-intensity agricultural uses in the Natural environment per WAC 173-26-211(5)(a)(ii)(E).

7.4.2 Aquaculture

- There are no known aquaculture uses within Walla Walla County, including hatcheries. However, future aquaculture activities may occur. The County and Cities should ensure that any salmon recovery-related aquaculture activities are facilitated in the aquatic and appropriate upland environments.

7.4.3 Boating Facilities

- Walla Walla County includes a variety of boating facilities, including port uses and park boat moorage and launching facilities. Regulations for the over- and in-water components should be developed to provide applicants with as much predictability as possible, while still allowing for an appropriate amount of flexibility based on site-specific conditions and use-specific needs.
- Public access should be included as components of new marinas or expansions, where feasible.

7.4.4 Commercial Development

- There is minimal commercial use in unincorporated Walla Walla County along the shorelines. However, the County should allow existing commercial uses to continue and identify criteria for where future commercial uses may be appropriate by providing clear priority for water-oriented uses.
- Consider incentives to attract water-oriented uses in appropriate locations along the shoreline.
- Public access should be included as a component of new non-water oriented commercial uses, where feasible.

- Ensure water-dependent uses are not restricted by other regulatory setbacks/buffers.
- Support the efforts by the Cities of Waitsburg and Walla Walla to provide for commercial development along the Touchet River and Mill Creek, respectively.

7.4.5 Forest Practices

- In the County, provide general policies and regulations for forest practices according to the SMP Guidelines. As provided for in WAC 173-26-241(3)(e), the master program should rely on the Forest Practices Act for regulation of commercial forestry. There are, however, specific limits on clear cutting provided in RCW 90.58.150 which must be included. Exceptions to this standard should be by conditional use review.
- The SMP standards should apply to Class IV General Forest Practices within the County where shorelines are being converted to non-forestry uses.
- Consider prohibiting this use for the Cities.

7.4.6 Industry

- The County should support the Port's efforts to retain existing and attract new water-oriented industrial uses in appropriate locations.
- The County (and Cities where appropriate) should recognize current industrial uses and consider incentives to attract water-oriented uses in appropriate locations along the shoreline.
- Recognize and allow existing and new industrial uses (e.g. grain silos), that serve the County's agriculture industry, provided they are developed and operated consistent with the Guidelines and other County and State requirements.

7.4.7 In-stream Structural Uses

- Large-scale in-stream structures intended to produce energy and/or moderate flooding are found in Walla Walla County. There are also a number of irrigation diversion and discharge structures in many waterbodies. Regulations need to accommodate anticipated new diversion structures, and repair/maintenance and possible expansion of existing projects.

7.4.8 Mining

- Very little mining actively occurs within Walla Walla County. The County and the City of Walla Walla should consider policies which emphasize locating new mining away from shorelines, floodplains, and streams.
- The Cities of Prescott and Waitsburg could consider prohibiting mining.

7.4.9 Recreational Development

- Recognizing that Walla Walla County has not historically served as a provider of parks and open space, include appropriate provisions for existing and potential recreational uses, including boating, swimming, and fishing for both the County and Cities.
- Work with local, state and federal parks departments; Army Corps of Engineers; and Port officials to ensure consistency between shoreline policies and regulations and long-term parks management plans.
- Policies and regulations related to parks management should provide clear preferences for shoreline restoration consistent with public access needs and uses.
- New shoreline access should be located and designed to maintain ecological functions.

7.4.10 Residential Development

- Residential uses in the unincorporated County are generally not concentrated in shoreline areas. Where proposed, residential development should proceed in a manner consistent with the control of pollution and prevention of damage to the shoreline environment.
- In the Cities and areas of more intense development, recognize current and planned shoreline residential uses with adequate provision of services and utilities as appropriate to allow for shoreline ecological protection.
- For the County and Cities, incorporate clear dimensional criteria for residential development, including setbacks/buffers, lot coverage, height limits, etc.
- Include provisions which ensure that new development, including the creation of new lots, would not require new shoreline stabilization. New primary and accessory residential structures should be located far enough from the shoreline to prevent such a need.
- For residential subdivisions that create five or more lots, consider how to create public or community access opportunities to the shoreline, as stipulated by the WAC Guidelines.

7.4.11 Transportation and Parking

- Given the prevalence of transportation infrastructure within or near shorelines, the County and Cities should allow for maintenance and improvements to existing roads, railroads and parking areas, and for necessary new roads and parking areas where other locations outside of shoreline jurisdiction are not feasible.

- Within the City of Walla Walla, promote additional trail connections consistent with local and regional plans.

7.4.12 Utilities

- The County and Cities should:
  - allow for maintenance and improvements to existing utility facilities; and
  - ensure that location of new utilities considers alternatives to location within shoreline jurisdiction and provide performance standards for necessary new utilities where other locations outside of shoreline jurisdiction are not feasible.

7.5 Restoration Plan

A Restoration Plan document will be prepared at a later phase of the Shoreline Master Program update process, consistent with WAC 173-26-201(2)(f). The Shoreline Restoration Plan will address the following six subjects (WAC 173-26-201(2)(f)(i-vi)) and incorporate findings from this Shoreline Analysis Report:

(i) Identify degraded areas, impaired ecological functions, and sites with potential for ecological restoration;

(ii) Establish overall goals and priorities for restoration of degraded areas and impaired ecological functions;

(iii) Identify existing and ongoing projects and programs that are currently being implemented, or are reasonably assured of being implemented (based on an evaluation of funding likely in the foreseeable future), which are designed to contribute to local restoration goals;

(iv) Identify additional projects and programs needed to achieve local restoration goals, and implementation strategies including identifying prospective funding sources for those projects and programs;

(v) Identify timelines and benchmarks for implementing restoration projects and programs and achieving local restoration goals; and

(vi) Provide for mechanisms or strategies to ensure that restoration projects and programs will be implemented according to plans and to appropriately review the effectiveness of the projects and programs in meeting the overall restoration goals.

The Restoration Plan will "include goals, policies and actions for restoration of impaired shoreline ecological functions. These master program provisions should be designed to

achieve overall improvements in shoreline ecological functions over time, when compared to the status upon adoption of the master program." The Restoration Plan will mesh opportunities identified in this report with additional projects, regional or local efforts, and programs of each jurisdiction, watershed groups, and environmental organizations that contribute or could potentially contribute to improved ecological functions of the shoreline.

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9 LIST OF ACRONYMS AND ABBREVIATIONS

cfs.....Cubic Feet per Second
Corps.....U.S. Army Corps of Engineers
CREP.....Conservation Reserve and Enhancement Program
Ecology.....Washington Department of Ecology
EIS.....Environmental Impact Statement
ESA.....Endangered Species Act
FEMA.....Federal Emergency Management Agency
GIS.....Geographic information systems
GMA.....Growth Management Act
HPA.....Hydraulic Project Approval
LWD.....Large Woody Debris
MOU.....Memorandum of Understanding
NLC.....National Land Cover
NOAA.....National Oceanographic and Atmospheric Administration
NPDES.....National Pollutant Discharge Elimination System
NRCS.....Natural Resources Conservation Service
NWI.....National Wetlands Inventory
OHWM.....Ordinary High Water Mark
PCB.....Polychlorinated biphenyl
PHS.....Priority Habitats and Species
RCW.....Revised Code of Washington
RAC.....Rural Activity Center
SMA.....Shoreline Management Act
SMP.....Shoreline Master Program
SSURGO.....Soil Survey Geographic Database
TMDL.....Total Maximum Daily Load
UGA.....Urban Growth Area
USDA.....U.S. Department of Agriculture
USFWS.....U.S. Fish and Wildlife Service
USGS.....U.S. Geological Service
WAC.....Washington Administrative Code
WDFW.....Washington Department of Fish and Wildlife
WDNR.....Washington Department of Natural Resources
WRIA.....Water Resource Inventory Area