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Critical Areas Ordinance Update

Best Available Science Review Addendum

CITY OF WALLA WALLA

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Prepared for:

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The information contained in this report is based on the application of technical guidelines currently accepted as the best available science. All discussions, conclusions, and recommendations reflect the best professional judgment of the author(s) and are based upon information available at the time the study was conducted. All work was completed within the constraints of budget, scope, and timing. The findings of this report are subject to verification and agreement by the appropriate local, state, and federal regulatory authorities. No other warranty, expressed or implied, is made.

Acronyms and Abbreviations

BAS	Best Available Science
BMP	Best Management Practices
CAO	Critical Areas Ordinance
CARA	Critical Aquifer Recharge Area
Commerce	Washington State Department of Commerce
CRB	Columbia River Basalt
CMZ	Channel Migration Zone
DNR	Washington State Department of Natural Resources
DOH	Washington State Department of Health
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FFA	Frequently Flooded Area
FIRM	Flood Insurance Rate Map
FWHCA	Fish and Wildlife Habitat Conservation Area
GIS	Geographic Information System
GMA	Growth Management Act
HUC	Hydrologic Unit Code
LID	Low Impact Development
OHWM	Ordinary High Water Mark
WWBWC	Walla Walla Basin Watershed Council
NFIP	National Flood Insurance Program
NMFS	National Marine Fisheries Service
PHS	Priority Habitats and Species
RCW	Revised Code of Washington
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code

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Appendices

APPENDIX A.....	Walla Walla County CAO Update Best Available Science Review FINAL
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1. INTRODUCTION

This review of the Best Available Science (BAS) was compiled to support the update of the City of Walla Walla's Critical Areas Ordinance (CAO). As mandated by the Washington State Growth Management Act (GMA), cities and counties must periodically update their comprehensive plans and development regulations. City of Walla Walla's Comprehensive Plan underwent a complete update in 2019. This document establishes the framework for planned updates to the CAO and serves as a basis for a gap analysis identifying which current critical-area regulations should be prioritized for consistency with BAS.

Walla Walla County is also going through the CAO update process. The County CAO work to-date includes a 2025 draft BAS review (Appendix A). That county-level BAS provides foundational scientific information that is also applicable within the City of Walla Walla. Accordingly, the purpose of this BAS review is not to replicate the County's work, but to supplement it by identifying and addressing local conditions specific to the City of Walla Walla and providing additional context to inform potential updates to City regulations.

Under the GMA, the City of Walla Walla must incorporate "best available science" (BAS) when developing policies and regulations to protect the functions and values of critical areas. Additionally, "special consideration" must be given to conservation or protection measures necessary to preserve or enhance anadromous fisheries. Anadromous fish spend parts of their life cycle in both freshwater and saltwater, entering freshwater from the ocean to spawn (WAC 365-195-900). Regulated critical areas include wetlands, areas critical for aquifer recharge used for potable water, fish and wildlife habitat conservation areas, frequently flooded areas, and geologically hazardous areas (RCW 36.70A.030(11)).

While this BAS review serves as a resource for critical area management, it is not designed to provide definitive answers for all policy and regulatory decisions. Policies and regulations should incorporate BAS and require decision-making processes grounded in societal values. Additionally, ecological systems are complex, and scientific knowledge continually evolves with new research and technology. Despite these advancements, there are limits to what is currently understood, and specific topics may remain ambiguous. Where scientific uncertainty exists in the literature about a particular subject, this review presents a range of current findings and recommendations. According to WAC 365-195-920, decision-makers may adopt a precautionary or no-risk approach when scientific information is incomplete.

1.1 Best Available Science

Best Available Science (BAS) refers to the most current and credible information developed through a valid scientific process as specified in WAC 365-195-900 through WAC 365-195-925. Characteristics of a valid scientific process include peer review, standardized methods, logical conclusions and reasonable inferences, quantitative analysis, proper context, and relevant references. Familiar sources of scientific

information encompass research, monitoring, inventory, modeling, assessment, and synthesis (WAC 365-195-905). BAS literature reviews synthesize the current scientific knowledge, and only resources meeting these criteria are included as references for this BAS.

The City of Walla Walla' most recent CAO in the City of Walla Walla Municipal Code (WWMC) Chapter 21.04 - Critical Areas.

1.2 Climate Change

As of July 2023, following the passage of Washington House Bill 1181, "Climate Change in Local Comprehensive Planning," the GMA requires jurisdictions to incorporate and evaluate the effects of climate change in long-range planning. Climate change is anticipated to have a profound influence on natural systems. Addressing anticipated climate change impacts on critical areas enables decision-makers to incorporate climate resilience into policies and regulations.

The Walla Walla County BAS Review includes a detailed discussion of climate change trends and management strategies for each critical area type. See Appendix B for further details.

2. CRITICAL AQUIFER RECHARGE AREAS

2.1 Definitions

Critical aquifer recharge areas (CARAs) are defined in WAC 365-190-030(3) as follows:

Critical aquifer recharge areas are areas with a critical recharging effect on aquifers used for potable water, including areas where an aquifer that is a source of drinking water is vulnerable to contamination that would affect the potability of the water, or is susceptible to reduced recharge.

The City of Walla Walla CAO defines CARAs as follows (WWMC 21.04.020):

means areas designated by WAC 365-190-080(2) that are determined to have a critical recharging effect on aquifers used for potable water as defined by WAC 365-190-030(2).

2.2 Designation

The City of Walla Walla CAO designates CARAs as follows (WWMC 21.04.200):

Critical aquifer recharge areas (CARA) are those areas with a critical recharging effect on aquifers used for potable water as defined by WAC 365-190-030(2). CARA have prevailing geologic conditions associated with infiltration rates that create a high potential for contamination of ground water resources or contribute significantly to the replenishment of ground water. CARA in the city of Walla Walla are designated as follows: sufficient to minimize the hazard.

A. Wellhead Protection Areas. Wellhead protection areas may be defined by the boundaries of the ten-year time of ground water travel or boundaries established using alternate criteria approved by the Washington State Department of Health in those settings where ground water time of travel is not a reasonable delineation criterion, in accordance with WAC 246-290-135.

B. The ten-year time of travel as defined in the wellhead protection plans submitted by communities and water providers to the Department of Health as of 2007. The city of Walla Walla maintains these groundwater capture zones. The CARA delineated by the ten-year capture zones are defined in Critical Area Map 1. Table 1 lists the communities and water providers in the city of Walla Walla that have designated wellhead protection areas. Table 1 also lists the total area encompassed by the ten-year time of travel.

2.3 CARA in the City of Walla Walla

City mapped gravel aquifers cover nearly the entirety of the incorporated city and its urban growth area (UGA) (Figure 1). Additionally, Walla Walla County has delineated the boundaries of wellhead protection areas, a type of CARA (Figure 2).

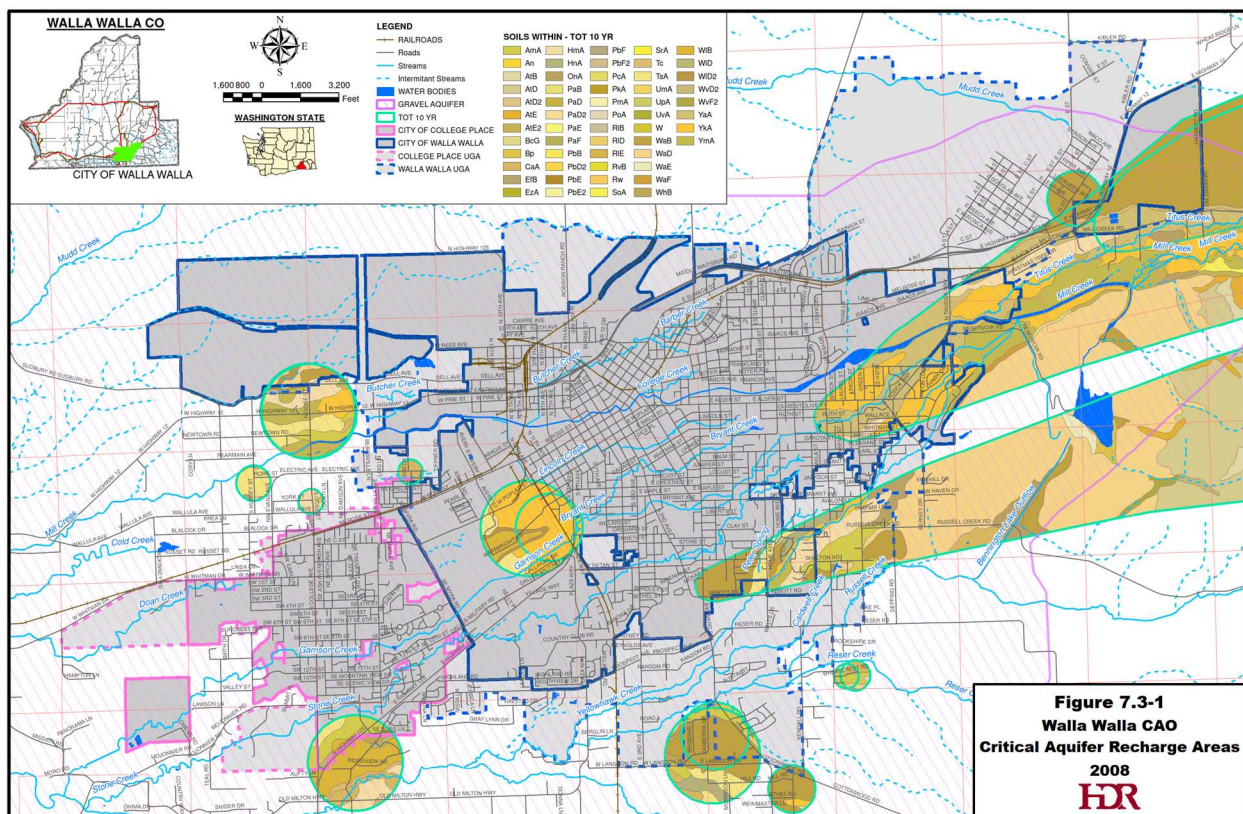


Figure 1. Critical Aquifer Recharge Areas mapped in City of Walla Walla (HDR 2008).

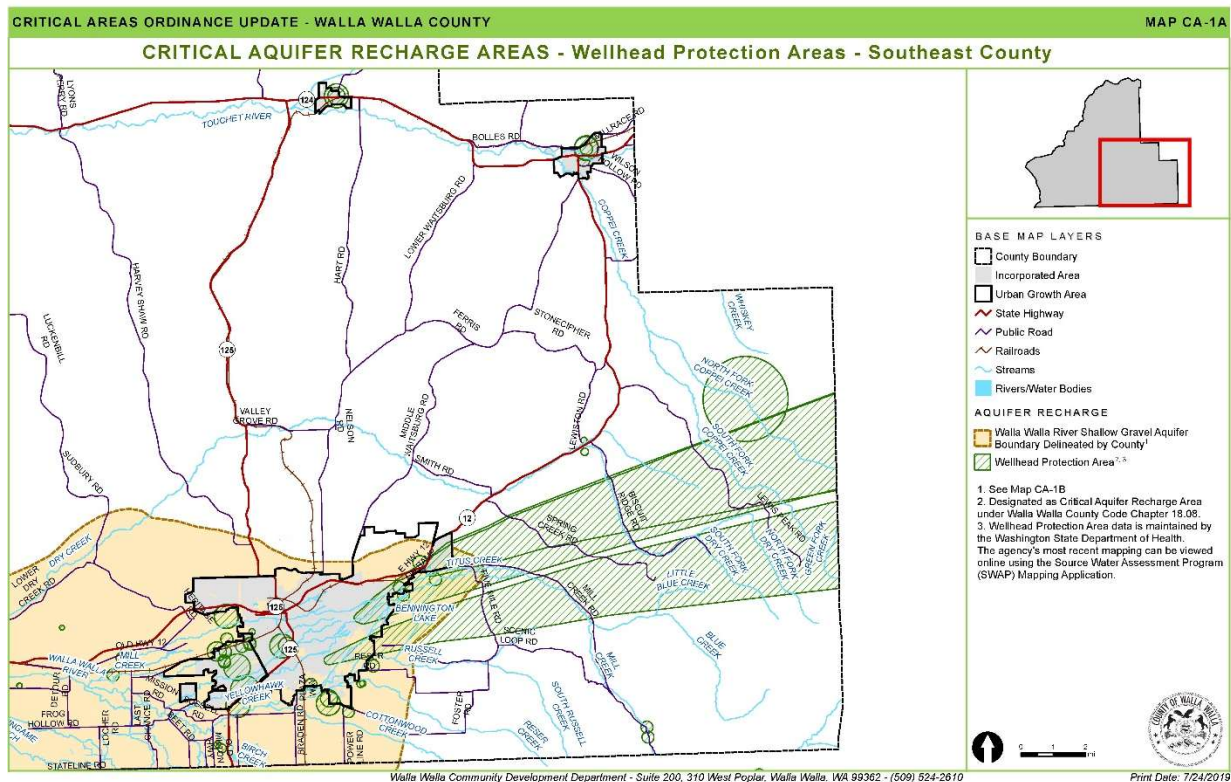


Figure 2. Designated wellhead protection areas. Reproduced from the Walla Walla Community Development Department, 2019.

2.3.1 Geology and Distribution

The Walla Walla Basin contains two principal aquifers: (1) The shallow gravel aquifer, which is made up of unconsolidated sediments located above a clay layer that encompasses the entire city and adjacent areas, and (2) the underlying basalt aquifer spans all of Walla Walla County and the Walla Walla River basin, including the City of Walla Walla. The entire gravel aquifer covers approximately 190 square miles, with about a third of that area in Oregon. In contrast, the basalt aquifer system in the Walla Walla River basin encompasses roughly 2,500 square miles, including the portion located in Oregon (HDR 2008).

The gravel aquifer typically occurs under unconfined or water-table conditions, though there are a few exceptions. This shallow aquifer has moderate to high permeability, meaning it can transmit water effectively. The highest permeabilities are found in the sands and gravels near stream and river channels. The gravel aquifer is also hydraulically connected to the streams, canals, and ditches above it. Water moves into and out of the gravel aquifer through various mechanisms, including rainfall, snowmelt, rivers, streams, ditches, and irrigation, allowing it to infiltrate and percolate through the ground (HDR 2008).

The Columbia River Basalt (CRB) formation beneath the City of Walla Walla consists of three major formations separated by sedimentary interbeds that generally impede water movement but can act as aquifers. These formations are combined and referred to as the “basalt aquifer.” This aquifer comprises interconnected layers of basalt flows, typically ranging from 5 to 150 feet thick, with only 5 to 10 percent of the thickness contributing to water transmission. The basalt aquifer has high permeability, with groundwater flow following low-lying areas where most groundwater storage occurs. The depth to water-bearing zones varies widely, and groundwater is generally confined. The basalt aquifer discharges primarily into streams, maintaining summer flows in Mill Creek and the Walla Walla River, and contributes to the Columbia and Snake Rivers. Generally, recharge occurs from the Blue Mountains and the Walla Walla River Basin (HDR 2008).

The hydraulic connection between the gravel and basalt aquifers is not fully understood. Some evidence suggests upward and downward flow through the clay layers, but modeling estimates indicate a predominance of upward movement from basalt to gravel. This connection may be less direct than previously thought, suggesting that changes in basalt pumping may have less impact on gravel aquifer levels and flow patterns (Golder Associates 2011).

3. WETLANDS

3.1 Definitions

Washington State defines wetlands in WAC 365-190-030(24) as follows:

“Wetland” or “wetlands” means areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. However, wetlands may include those artificial wetlands intentionally created from nonwetland areas to mitigate conversion of wetlands, if permitted by the City or city.

The City of Walla Walla CAO definition of wetlands is substantively similar but includes a requirement for the use of the federal delineation manual (WWMC 21.04.020):

means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or

those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from nonwetland areas to mitigate the conversion of wetlands. For identifying and delineating a wetland, local government shall use the approved federal delineation manual and regional supplement, as amended.

3.2 Designation

The City of Walla Walla CAO designates wetlands as follows (WWMC 21.04.300):

Wetlands are those areas designated in accordance with the approved federal wetland delineation manual and applicable regional supplements, as amended, that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. All areas within the city of Walla Walla meeting the wetland designation criteria in the approved federal wetland delineation manual and applicable regional supplements, as amended, regardless of any formal identification, are hereby designated critical areas and are subject to the provisions of this title.

3.3 Wetlands in the City of Walla Walla

Known wetland locations in the City are shown in the 2008 Critical Areas Maps and Walla Walla County GIS database (Figures 3 and 4).

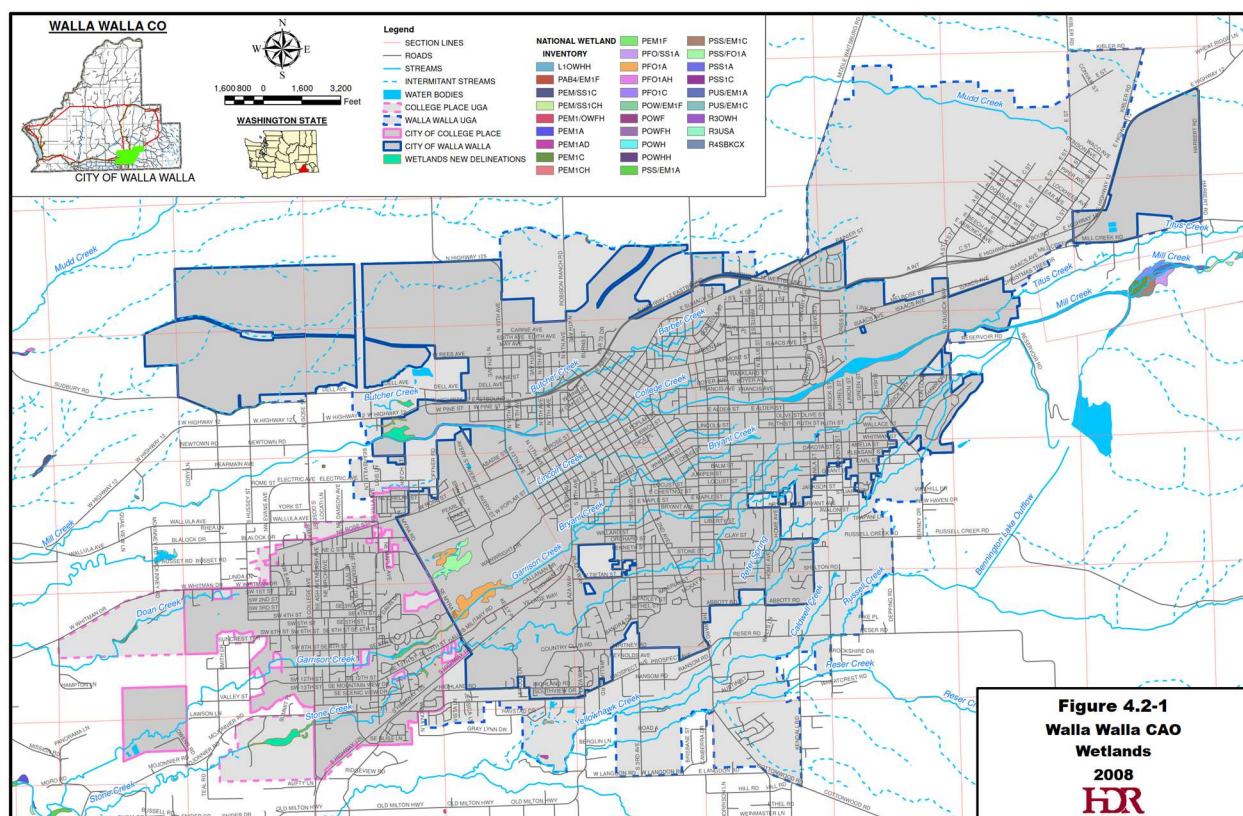


Figure 3. Mapped wetlands in the City of Walla Walla and UGA (HDR 2008).

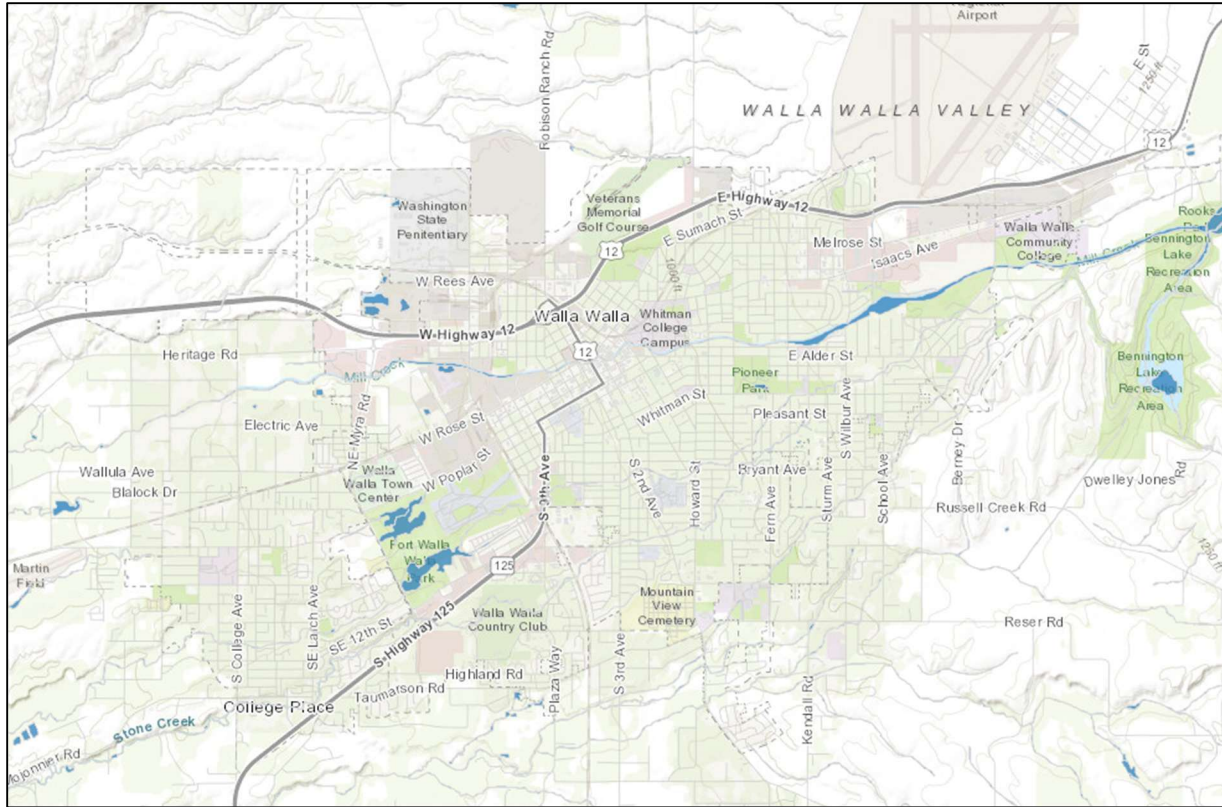


Figure 4. Wetlands mapped by Walla Walla County GIS database, retrieved April 8, 2026.

3.3.1 Wetland Distribution

City of Walla Walla is situated within the rain shadow of the Cascade Mountains, resulting in a semi-arid climate. Wetlands, predominantly riparian wetlands, occur in areas along perennial drainageways due to water availability. While isolated wetlands are less common in the City of Walla Walla, they play essential roles as habitat. Agricultural activities, such as surface water diversion for irrigation, influence the distribution and types of wetlands. Return flows from agriculture can create wetland conditions in drains or low areas.

Wetlands provide essential benefits to humans and wildlife. Woody vegetation stabilizes streambanks during floods, regulates water temperatures, and supports diverse habitats, including associated wetlands. The riparian wetlands along major drainage corridors, such as the Mill Creek, Yellowhawk Creek, Garrison Creek and Stone Creek, provide habitat and support aquatic life. These rivers and their riparian zones also function as important wildlife corridors.

4. FREQUENTLY FLOODED AREAS

4.1 Definitions

Frequently flooded areas (FFAs) are defined in WAC 365-190-030(8) as follows:

Frequently flooded areas are lands in the flood plain subject to at least a one percent or greater chance of flooding in any given year, or within areas subject to flooding due to high groundwater. These areas include, but are not limited to, streams, rivers, lakes, coastal areas, wetlands, and areas where high groundwater forms ponds on the ground surface.

The City of Walla Walla regulates flood hazard areas in WWMC Chapter 21.10 – Floodplain Management and does not have a definition of frequently flooded areas. Instead it is referenced as a *special flood hazard area*, defined as follows (WWMC 21.10.070):

The areas of special flood hazard, as may be annexed to the city of Walla Walla, identified by the Federal Insurance Administration in a scientific and engineering report entitled, "The Flood Insurance Study for the Unincorporated Areas in Walla Walla County," dated January 18, 2002, or as amended, with accompanying flood insurance rate maps (FIRM) is adopted by reference and declared to be a part of this chapter. The flood insurance study and FIRM are on file at the development services department.

4.2 Frequently Flooded Areas in the City of Walla Walla

No frequently flooded areas (FFA) are mapped within city limits. Mill Creek through the city center is mapped as a flood control channel. Mapped 100-year floodplains and floodways are within the UGA south of the city, along Reser Creek, Russell Creek and Yellowhawk Creek. A 100-year floodplain is also mapped in the northeastern UGA between Mudd Creek and Mill Creek (Figure 5).

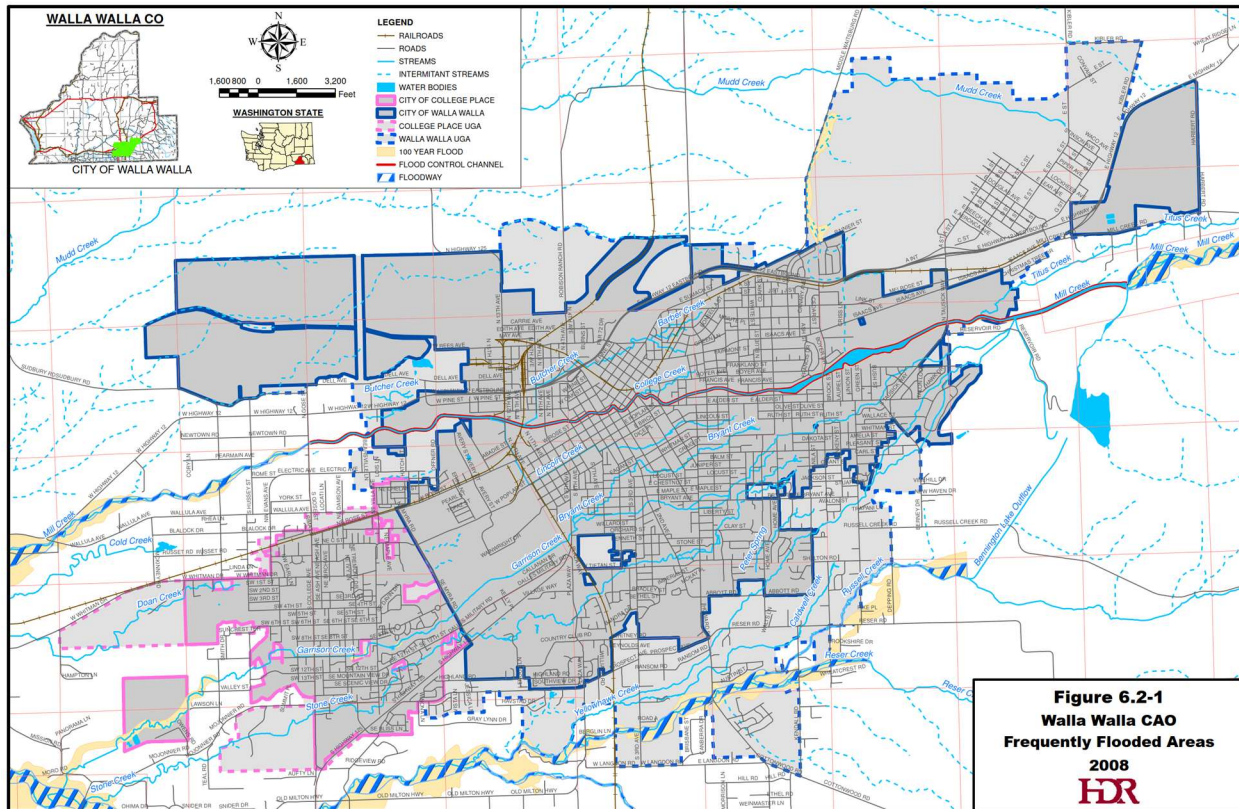


Figure 5. Mapped FFA in the City of Walla Walla and UGAs (HDR 2008).

4.2.1 Flood Hazard Mapping

In 2024, the City of Walla Walla, in collaboration with local officials and the cities of College Place, Prescott, Waitsburg, and Walla Walla County, updated the 2010 County of Walla Walla Multi-Jurisdictional Hazard Mitigation Plan. The Mill Creek Flood Control Zone District and Walla Walla Public Schools were also involved in this update, alongside various local, state, and federal agencies. FEMA approved the finalized plan in October 2018. The current Flood Insurance Rate Maps (FIRMs), effective December 1, 1983, serve as the basis for identifying flood-prone areas and regulating development in the City's floodplains. While three individual panels were updated on January 18, 2002, FEMA is modernizing all FIRMs through its Map Modernization program. However, it does not currently have plans to update the City of Walla Walla's Flood Insurance Study and FIRMs. As a result, the existing FIRMs will likely remain the City's primary resource for the next several years. In the early 1980s, the City of Walla Walla and the City of Waitsburg received FIRMs and Flood Boundary and Floodway Maps (FBFMs). College Place and Prescott received mapping efforts in 2001 and 2002, respectively, while Walla Walla was never mapped. These tools help identify flood risks and define river channels and adjacent areas needed to manage floodwaters effectively.

5. GEOLOGICALLY HAZARDOUS AREAS

5.1 Definitions

Geologically hazardous areas (GHAs) are defined by Washington State as “areas that, because of their susceptibility to erosion, sliding, earthquake, or other geological events, are not suited to the siting of commercial, residential, or industrial development consistent with public health or safety concerns” (WAC 365-190-030). The four main types of geologically hazardous areas are erosion hazard areas, landslide hazard areas, seismic hazard areas, and areas subject to other geologic events such as coal mine hazards and volcanic hazards (WAC 365-190-120).

Walla Walla’s definition is substantively similar, as follows (WWMC 21.04.020): “areas that may not be suited to development consistent with public health, safety or environmental standards because of their susceptibility to erosion, sliding, earthquake, or other geological events as designated by WAC [365-190-030\(9\)](#). Types of geologically hazardous areas include: erosion, landslide, seismic, mine, and volcanic hazards.”

5.2 Designation

The City of Walla Walla designates potential geologic hazard areas per WWC 21.04.500:

- A. *Geologically hazardous areas include areas susceptible to erosion, sliding, earthquake, or other geological events. The following regulations, in combination with the performance standards for development, will guide development in these critical areas. The purpose of these regulations is to maintain the natural integrity of hazardous areas and their buffers in order to protect adjacent lands from the impacts of landslides, mudslides, subsidence, excessive erosion and seismic events, and to safeguard the public from these threats to life or property. Geologically hazardous areas are designated as those areas that are susceptible to one or more of the following types of hazards:*
 - 1. *Erosion hazard;*
 - 2. *Landslide hazard;*
 - 3. *Seismic hazard;*
 - 4. *Other geological events including mass wasting, debris flows, rock falls, and differential settlement.*
- B. *Erosion Hazard Areas. Erosion hazard areas are those areas of the city of Walla Walla which:*
 - 1. *Contain soils or soil complexes identified by the U.S. Department of Agriculture's Natural Resource Conservation Service or the soil survey for the city of Walla Walla as having moderate to severe, severe or very severe erosion hazard potential; or*
 - 2. *Are impacted by shore land and/or stream bank erosion; or*
 - 3. *Areas with a slope greater than fifteen percent.*

- C. *Landslide Hazard Areas. Landslide hazard areas are those areas susceptible to landslides because of any combination of bedrock, soil, slope (gradient), slope aspect, structure, hydrology, or other physical factors. Potential landslide hazard areas exhibit one or more of the following characteristics:*
1. *Sensitive Sloped Areas. Slopes exceeding thirty-five percent with a vertical relief of ten or more feet except areas composed of competent rock and properly engineered slopes designed and approved by a geotechnical engineer licensed in the state of Washington and experienced with the site;*
 2. *Areas mapped by the Washington State Department of Natural Resources (slope stability mapping) as unstable ("U"), unstable old slides ("UOS"), or unstable recent slides ("URS");*
 3. *Areas designated by the U.S. Department of Agriculture's Natural Resource Conservation Service as having severe limitations for building site development;*
 4. *Areas that have shown evidence of historic failure or instability, including but not limited to back-rotated benches on slopes; areas with structures that exhibit structural damage such as settling and racking of building foundations; and areas that have toppling, leaning, or bowed trees caused by ground surface movement;*
 5. *Slopes greater than fifteen percent that have a relatively permeable geologic unit overlying a relatively impermeable unit and having springs or groundwater seepage;*
 6. *Areas potentially unstable as a result of rapid stream incision, stream bank erosion, and undercutting by wave action;*
 7. *Areas located in a canyon or active alluvial fan, presently or potentially subject to inundation by debris flows or catastrophic flooding; and*
 8. *Areas designated as quaternary slumps, earthflows, mudflows, lahars, or landslides on maps published by the U.S. Geological Survey or Washington State Department of Natural Resources;*
 9. *Areas that are at risk of mass wasting due to seismic forces; and*
 10. *Slopes having gradients steeper than eighty percent subject to rock fall during seismic shaking.*
- D. *Seismic Hazard Areas. Seismic hazard areas are those areas subject to severe risk of damage as a result of earthquake-induced ground shaking, slope failure, soil liquefaction or surface faulting including:*
1. *Areas subject to surface faulting during a seismic event;*
 2. *Areas with underlying deposits indicative of a risk of liquefaction during a seismic event, including those areas mapped as moderate, moderate to high and high by the Washington State Department of Natural Resources;*
 3. *Areas subject to slope failure during a seismic event;*
 4. *Areas that are at risk of mass wasting due to seismic forces.*

Seismic hazards shall be as identified in Washington State Department of Natural Resources seismic hazard and liquefaction susceptibility maps for eastern Washington and other geologic resources.

- E. Other Hazard Areas. Geologically hazardous areas shall also include areas determined by the director those areas subject to severe risk of damage as a result of other geological events including mass wasting, debris flows, rock falls and differential settlement.*

5.3 Potential Geologic Hazards in the City of Walla Walla

Potential geologic hazards mapped in the City of Walla Walla and surrounding UGA are liquefaction, steep slopes, erosion due to water, and erosion due to wind (Figures 6 through 9). Landslide hazard areas within the City are not mapped.

The majority of the city has moderate to high susceptibility to liquefaction. Liquefaction susceptibility in the northwest corner and portions of the southwest is low and moderate (Figure 6). Steep slopes are concentrated at the north and south ends of the City (Figure 7). Susceptibility to water erosion is mapped at the east and west ends of Mill Creek and west of downtown (Figure 8). High to moderate wind erosion susceptibility is mapped throughout the city and UGAs. There is no wind erosion data within the city core (Figure 9).

The City of Walla Walla is in the southeastern part of the Walla Walla Plateau, a section of the Columbia Plateaus physiographic province. The northern Rocky Mountains border the Columbia Plateaus to the east and the Sierra Nevada-Cascade region to the west. Known for its diverse landforms across Oregon, Idaho, and Washington, the Columbia Plateaus cover approximately 100,000 square miles (HDR 2008).

This region primarily consists of uniform basaltic lava flows that exhibit significant folding and faulting, resulting in elevations ranging from about 200 to 5,000 feet above mean sea level (MSL). Older mountain ranges, such as the Blue Mountains and Wallowa Mountains rise above the lava flows in certain areas (HDR 2008).

The terrain of the Columbia Plateaus is predominantly harsh and arid, characterized by coulees, scablands, and other features that reflect the movement of glacial waters across the landscape, alongside isolated volcanic formations. Sedimentary deposits intermingle with the lava; in some areas, the loess is deep enough to create fertile land.

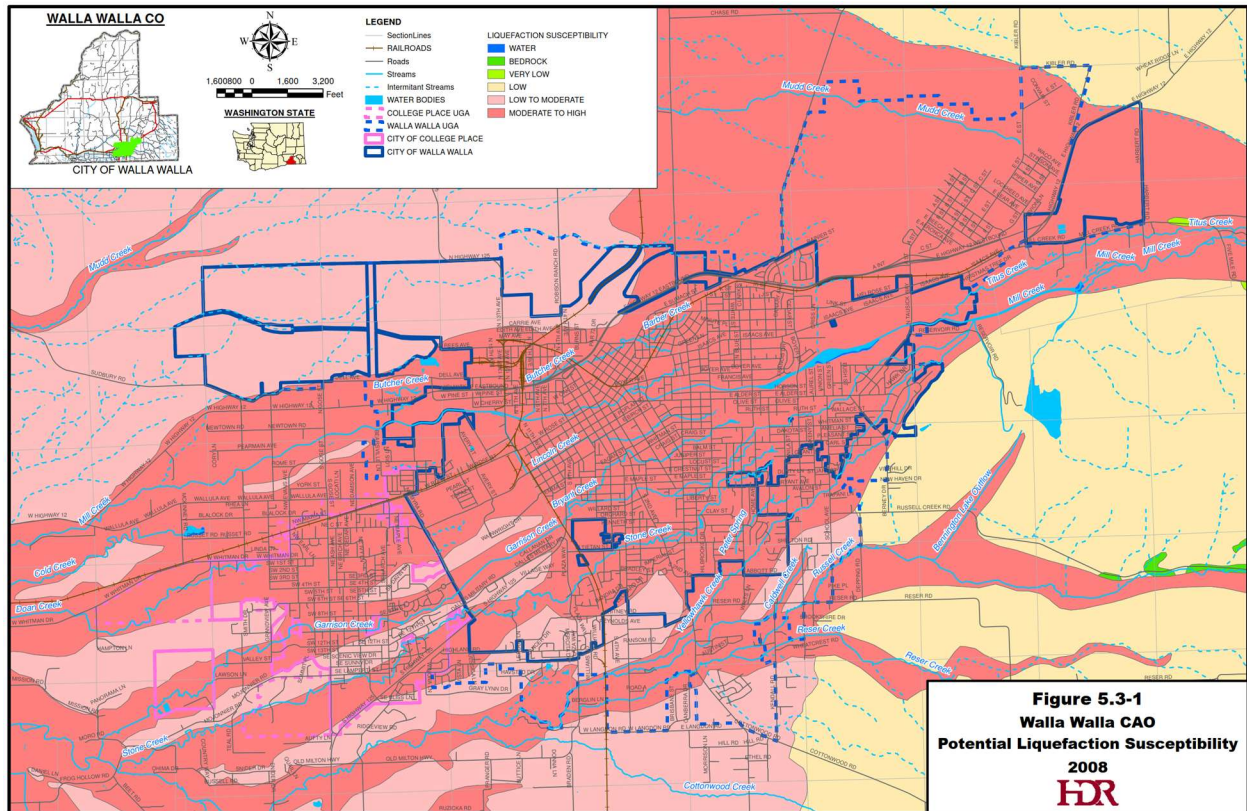


Figure 6. Potential liquefaction areas in the City of Walla Walla (HDR 2008).

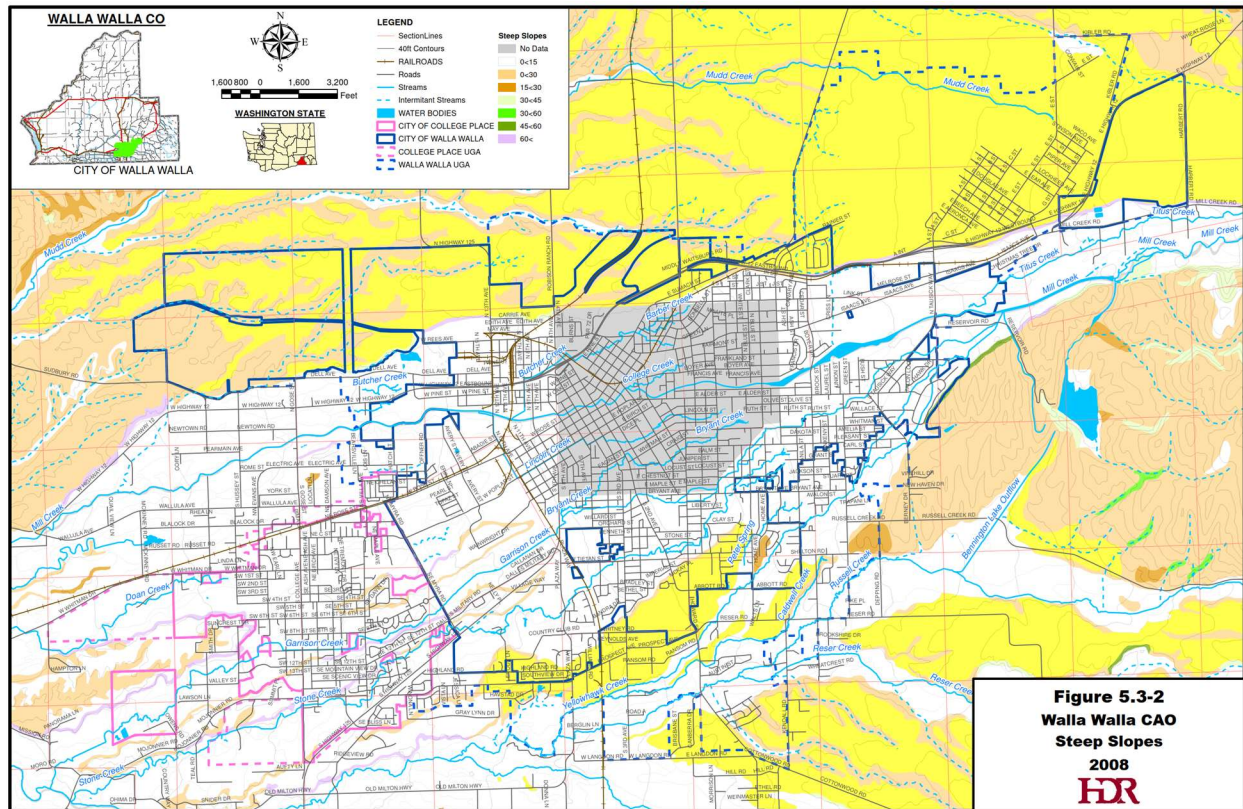


Figure 7. Steep slopes in the City of Walla Walla (HDR 2008).

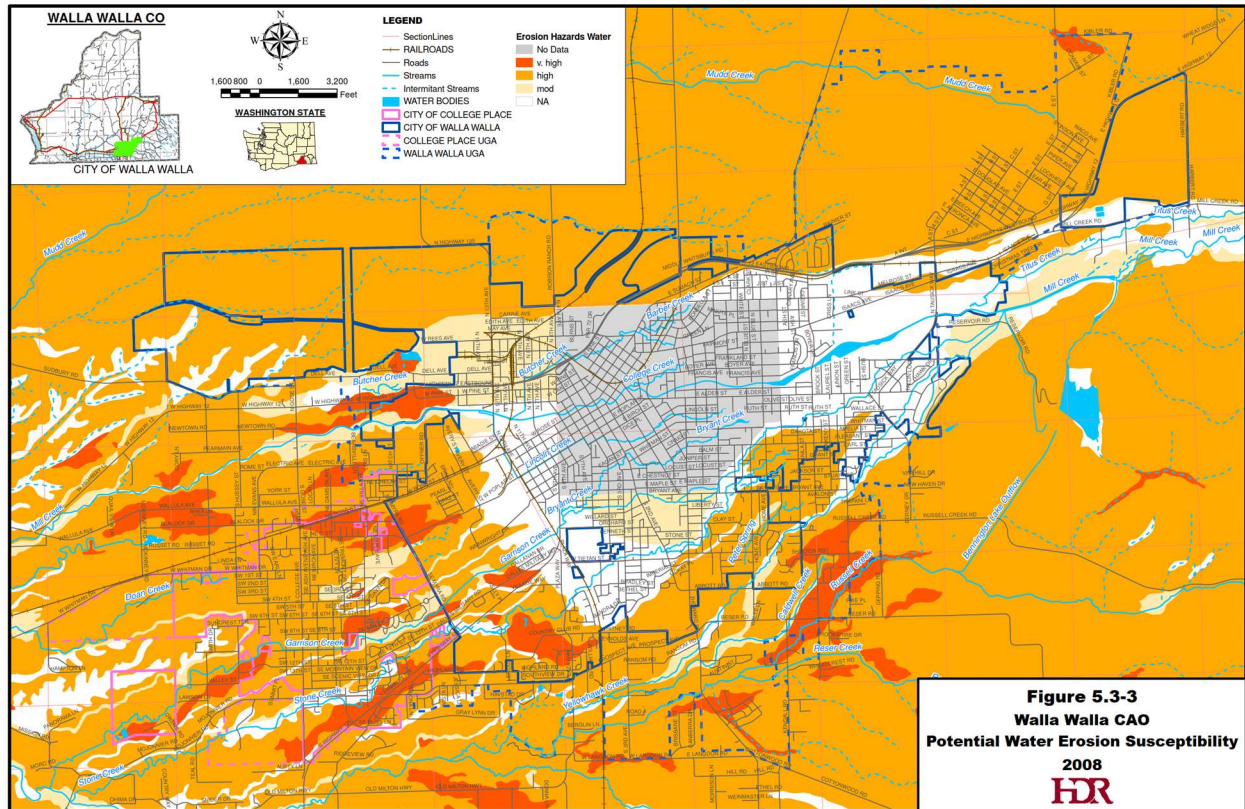


Figure 8. Potential erosion hazard due to water in the City of Walla Walla (HDR 2008).

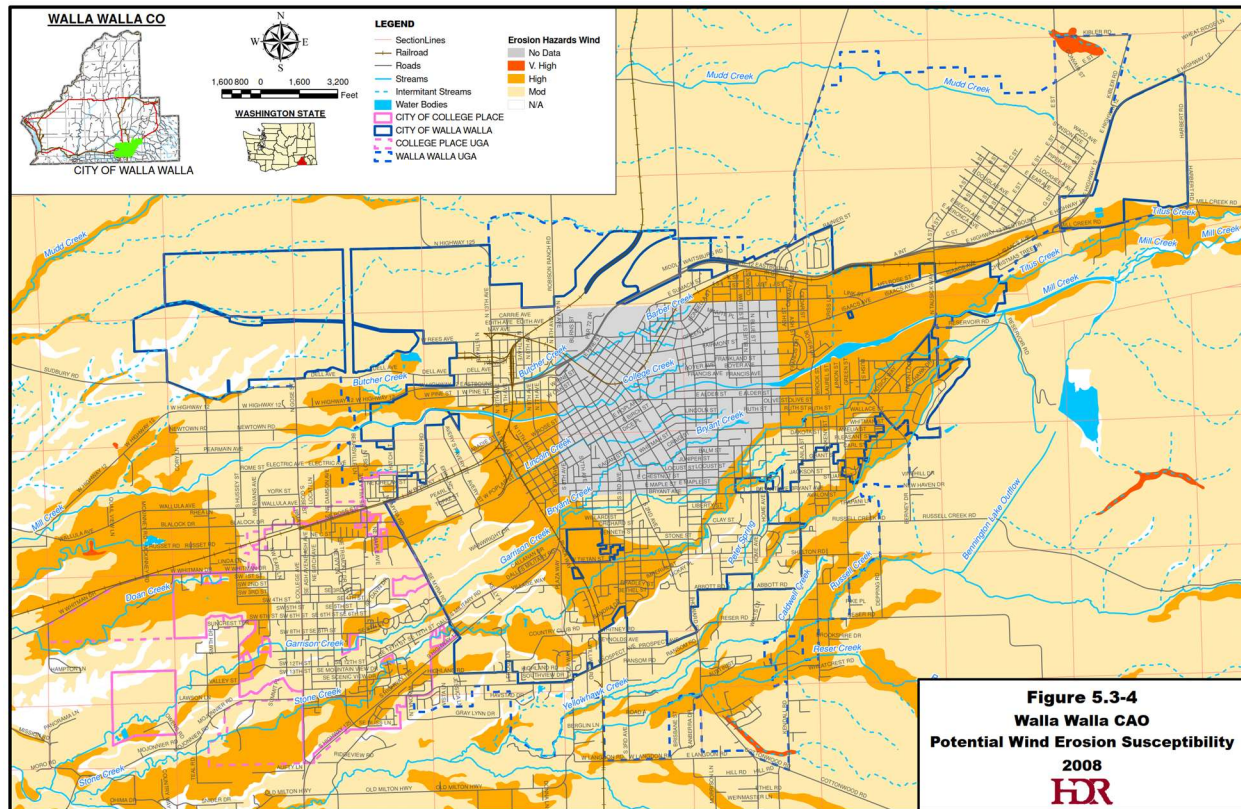


Figure 9. Potential erosion hazard due to wind in the City of Walla Walla (HDR 2008).

6. FISH AND WILDLIFE HABITAT CONSERVATION AREAS

6.1 Definitions

Washington State defines fish and wildlife habitat conservation areas (FWHCAs) in WAC 365-190-030(6) as follows:

- (a) *"Fish and wildlife habitat conservation areas" are areas that serve a critical role in sustaining needed habitats and species for the functional integrity of the ecosystem, and which, if altered, may reduce the likelihood that the species will persist over the long term. These areas may include, but are not limited to, rare or vulnerable ecological systems, communities, and habitat or habitat elements including seasonal ranges, breeding habitat, winter range, and movement corridors; and areas with high relative population density or species richness. Counties and cities may also designate locally important habitats and species.*
- (b) *"Habitats of local importance" designated as fish and wildlife habitat conservation areas include those areas found to be locally important by counties and cities.*

- (c) *"Fish and wildlife habitat conservation areas" does not include such artificial features or constructs as irrigation delivery systems, irrigation infrastructure, irrigation canals, or drainage ditches that lie within the boundaries of, and are maintained by, a port district or an irrigation district or company.*

The following FWHCAs must be considered for classification and designation (WAC 365-190-130):

- (a) *Areas where endangered, threatened, and sensitive species have a primary association;*
- (b) *Habitats and species of local importance, as determined locally;*
- (c) *Commercial and recreational shellfish areas;*
- (d) *Kelp and eelgrass beds; herring, smelt, and other forage fish spawning areas;*
- (e) *Naturally occurring ponds under 20 acres and their submerged aquatic beds that provide fish or wildlife habitat;*
- (f) *Waters of the state;*
- (g) *Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity; and*
- (h) *State natural area preserves, natural resource conservation areas, and state wildlife areas.*

The City of Walla Walla CAO defines FWHCAs as follows (WWMC 21.04.020):

means areas that serve a critical role in sustaining needed habitats and species for the functional integrity of the ecosystem, and which, if altered, may reduce the likelihood that the species will persist over the long term. These areas may include, but are not limited to, rare or vulnerable ecological systems, communities, and habitat or habitat elements including seasonal ranges, breeding habitat, winter range, and movement corridors; and areas with high relative population density or species richness. "Fish and wildlife habitat conservation areas" does not include such artificial features or constructs as irrigation delivery systems, irrigation infrastructure, irrigation canals, or drainage ditches that lie within the boundaries of, and are maintained by, a port district or an irrigation district or company (WAC 365-190-030(6)). These areas are guided by the state's priority habitats and species list and include the following:

1. *Areas with which state or federally designated endangered, threatened, and sensitive species have a primary association;*
2. *Habitats of local importance, including but not limited to areas designated as priority habitat by the Department of Fish and Wildlife, areas that provide important habitat for neotropical migratory songbirds, areas that provide important habitat for wintering birds of prey, and areas that provide unique habitats within the city;*
3. *Naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or wildlife habitat, including those artificial ponds intentionally created from dry areas in order to mitigate impacts to ponds;*
4. *Waters of the state, including lakes, rivers, ponds, streams, inland waters, underground waters, salt waters and all other surface waters and watercourses within the jurisdiction of the state of Washington;*

5. Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity;
6. State natural area preserves and natural resource conservation areas; and
7. Land essential for preserving connections between habitat blocks and open spaces.

6.2 Designation

The City of Walla Walla CAO designates FWHCAs as follows (WWMC 21.04.600):

A. Fish and wildlife habitat conservation areas include:

- 1. Areas where state or federally-designated endangered, threatened, and sensitive species have a primary association.*
 - a. Federal designated endangered and threatened species are those fish, wildlife, and plant species identified by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service that are in danger of extinction or threatened to become endangered. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service should be consulted as necessary for current listing status.*
 - b. State designated endangered, threatened, and sensitive species are those fish, wildlife and plant species native to the state of Washington identified by the state Department of Fish and Wildlife, that are in danger of extinction, threatened to become endangered, vulnerable, or declining and are likely to become endangered or threatened in a significant portion of their range within the state without cooperative management or removal of threats. State designated endangered, threatened, and sensitive species are periodically recorded in WAC 232-12-014 (state endangered species), and WAC 232-12-011 (state threatened and sensitive species). The state Department of Fish and Wildlife maintains the most current listing and should be consulted as necessary for current listing status.*
- 2. State priority habitats and areas associated with state priority species. Priority habitats and species are considered priorities for conservation and management. Priority species require protective measures for their perpetuation due to their population status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. Priority habitats are those habitat types or elements with unique or significant value to a diverse assemblage of species. A priority habitat may consist of a unique vegetation type or dominant plant species, a described successional stage, or a specific structural element. Priority habitats and species are identified by the state Department of Fish and Wildlife.*
- 3. Habitats and species of local importance. Habitats and species of local importance are those identified by the City, including those that possess unusual or unique habitat warranting protection because of species diversity or habitat system health indicators. The following*

habitats and species of local importance, shown on Map CA-5B, have been designated: High Density of Wintering Birds of Prey Habitat, Raptor Ferruginous Hawk Habitat, and Neotropical Migrant Songbird Habitat.

- 4. Naturally occurring ponds under twenty (20) acres. Naturally occurring ponds are those ponds under twenty (20) acres and their submerged aquatic beds that provide fish or wildlife habitat, including those artificial ponds intentionally created from dry areas in order to mitigate impacts to ponds. Naturally occurring ponds do not include ponds deliberately designed and created from dry sites, such as canals, detention facilities, wastewater treatment facilities, farm ponds, temporary construction ponds, and landscape amenities, unless such artificial ponds were intentionally created for mitigation.*
 - 5. Waters of the state. Waters of the state includes lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the state of Washington, as classified in WAC 222-16-031.*
 - 6. Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity.*
 - 7. State Natural Area Preserves and Natural Resource Conservation Areas. Natural area preserves and natural resource conservation areas are defined, established, and managed by the state Department of Natural Resources.*
 - 8. Land essential for preserving eco-connectivity between habitat blocks and open spaces.*
 - 9. Areas of rare plant species and high quality ecosystems that are identified by the Washington State Department of Natural Resources through the Natural Heritage Program. Streams shall be designated in accordance with the Washington State Department of Natural Resources (DNR) stream type as provided in WAC 222-16-030. Streams are further categorized according to ecosystem diagnosis and treatment (EDT)/Walla Walla Subbasin Plan priority protection reaches.*
 - 10. Areas of rare plant species and high quality ecosystems that are identified by the Washington State Department of Natural Resources through the Natural Heritage Program.*
- B. All areas within the City meeting one or more of these criteria, regardless of any formal identification, are hereby designated critical areas and are subject to the provisions of this title.*
- C. The following is identified as an area of local importance: hawk habitat identified on Critical Area Map 6.*
- D. Shoreline Jurisdiction. The city's shoreline jurisdiction encompasses the Mill Creek water body plus its associated shorelands, which, in accordance with state law, includes lands within two hundred feet of the ordinary high water mark (OHWM) of Mill Creek, as well as floodways, floodplain areas within two hundred feet of a mapped floodway, and associated wetlands. Mill*

Creek and other fish and wildlife habitat conservation areas occurring within shoreline jurisdiction are subject to the provision of the critical areas regulations in the City of Walla Walla Shoreline Master Program, Appendix A, instead of the provisions of this title.

6.3 FWHCA in the City of Walla Walla

6.3.1 Streams, ponds, lakes

The City of Walla Walla contains 15 named streams and several tributaries labeled as intermittent (Figure 10). The city contains a few small ponds that appear to be managed landscape amenities. No lakes are present.

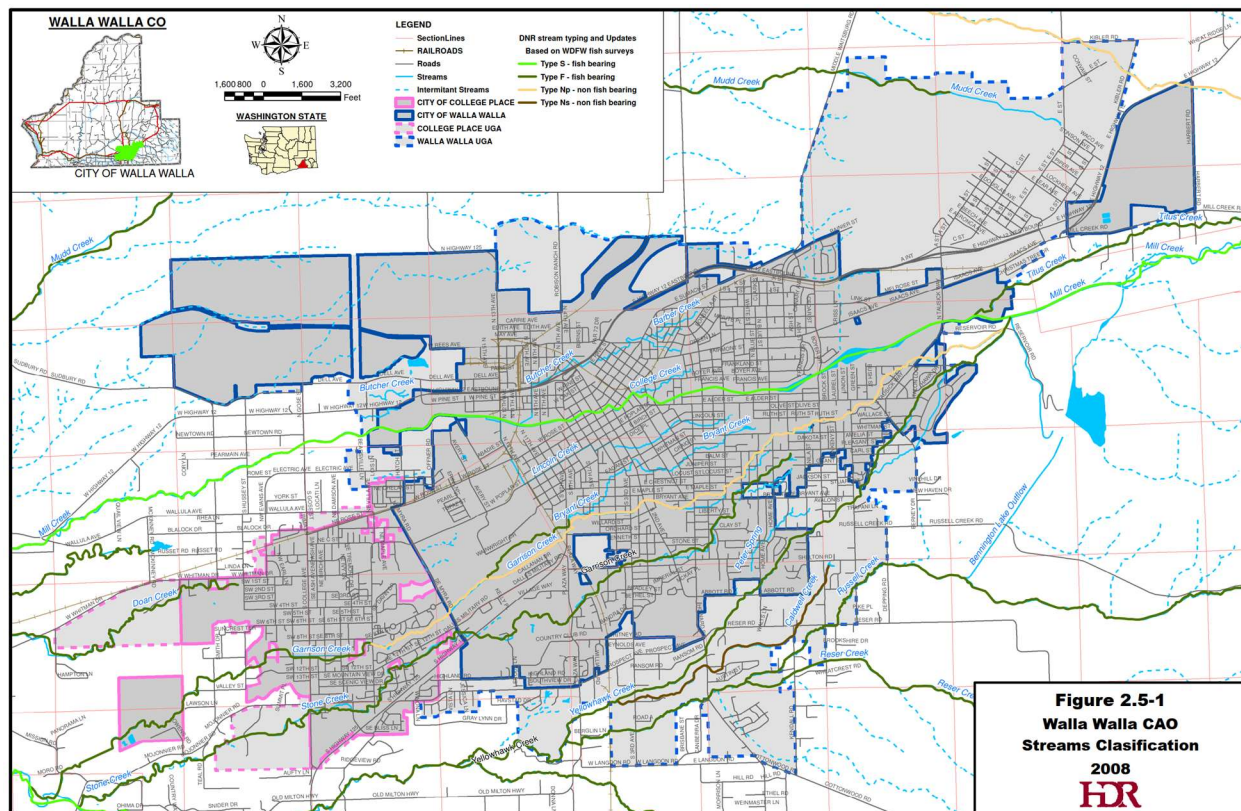


Figure 10. Mapped stream classifications in the City of Walla Walla (HDR 2008).

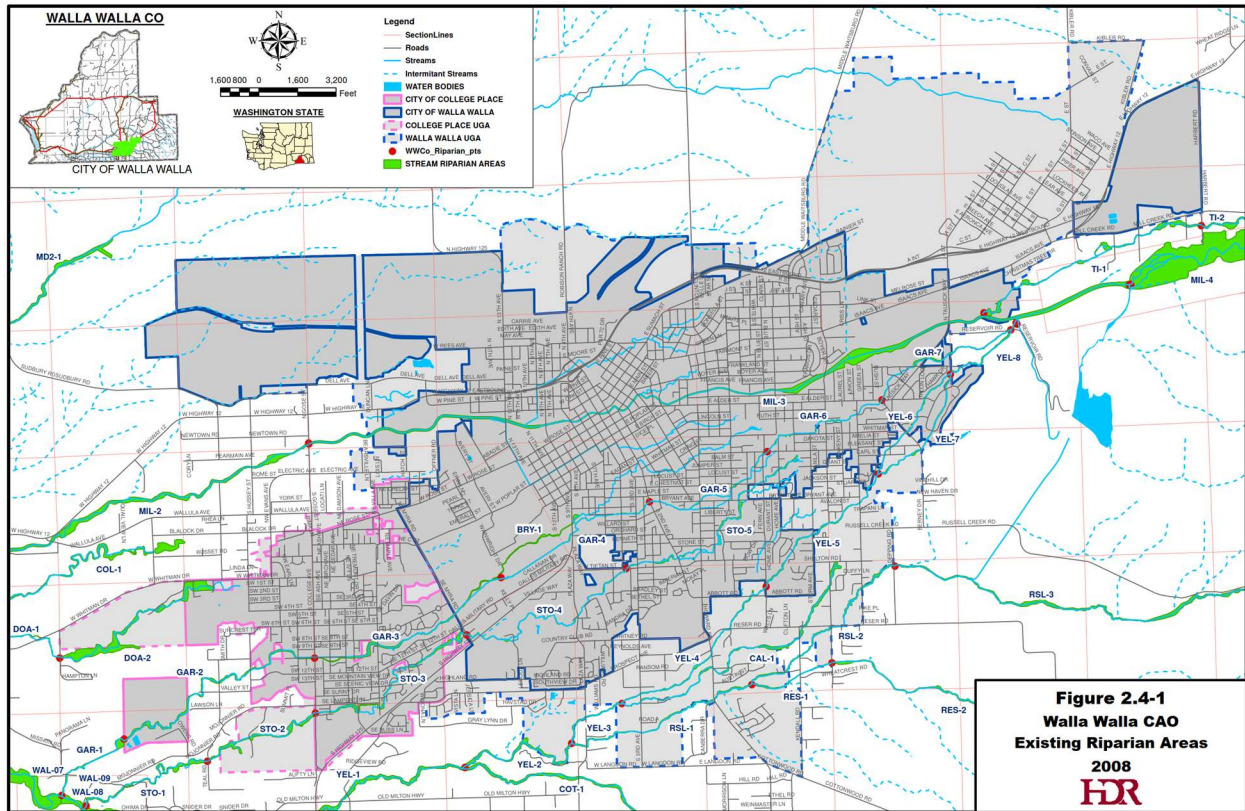


Figure 11. Existing riparian areas in the City of Walla Walla (HDR 2008).

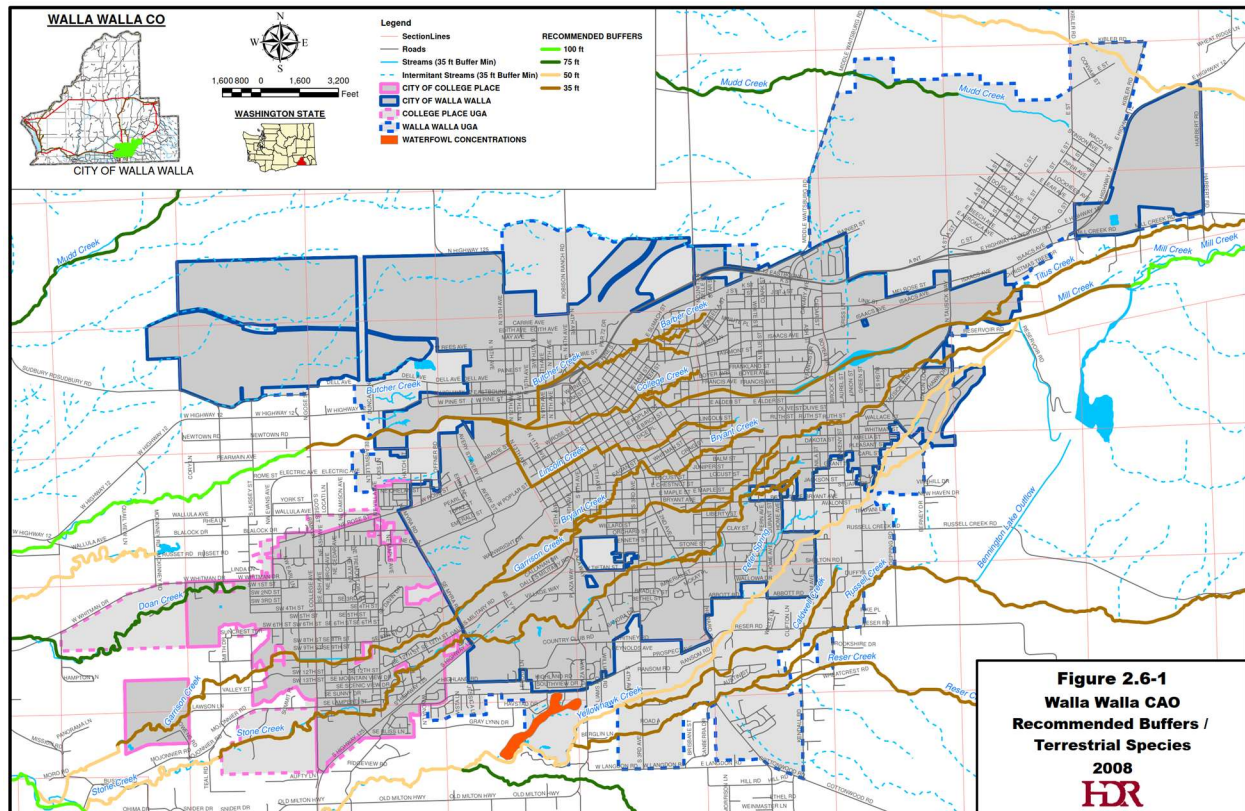


Figure 12. City of Walla Walla recommended FWHCA buffers.

6.3.2 Wildlife and Habitat

Wildlife habitat in the upper reaches of the main rivers and tributaries is generally high quality, including Mill Creek, which contain native vegetation communities. Mountain and foothill forests in these areas support a diversity of large mammals such as elk, mule deer, white-tailed deer, black bears, coyotes, mountain lions, and bobcats, as well as small mammals such as beavers, river otters, minks, and raccoons. The upper drainages also provide habitat for a wide range of bird species, including ruffed grouse, woodpeckers, hummingbirds, and numerous songbirds.

In contrast, habitat complexity and quality in the lowland valleys, including much of the city and surrounding lands, are shaped by intensive agriculture and fragmented riparian vegetation. These lowland areas continue to support white-tailed and mule deer, ring-necked pheasants, quail, mourning doves, raptors, songbirds, and small mammals (Northwest Management, Inc. 2018). Nearby regional habitats include the Blue Mountains to the east, the Columbia River to the west, with a mosaic of shrub steppe in patches amongst the farmlands and urban areas.

The rivers of the City of Walla Walla flow to the Walla Walla and Touchet Rivers which historically supported Chinook, Coho, and chum salmon. Priority fish species mapped within the City of Walla

Walla are summarized in Table 1 below. The City of Walla Walla is home to bull trout and steelhead, both listed as threatened under the Federal Endangered Species Act.

Table 1. Priority fish species distribution in the City of Walla Walla (HDR 2008).

Priority fish species	Notes	Stream
Bull trout	Migration	College Creek Garrison Creek Mill Creek Yellowhawk Creek
Steelhead (summer)	Rearing	Garrison Creek Mill Creek Yellowhawk Creek
	Presumed presence	Caldwell Creek Garrison Creek Russell Creek Stone Creek
Chinook salmon (spring)	Primary migration	Yellowhawk Creek

A large expanse of riparian habitat exists in the 1,896-acre Wallula Habitat Management Unit, which has been managed by USACE since 2007. This unit, located at the mouth of the Walla Walla River west of the City of Walla Walla, features a mix of cottonwood forests, various shrubs, wetlands, sagebrush, and agricultural lands that support many species, including waterfowl, shorebirds, songbirds, raptors, upland game birds, mule deer, white-tailed deer, furbearers, and small mammals.

Washington Department of Fish and Wildlife (WDFW) maps priority habitats and species. A waterfowl concentration is mapped at the south end of the City near Yellowhawk Creek. Ferruginous hawks are mapped at the Township level and the City is within that species' historic range. A few Ferruginous hawk breeding areas are mapped in the City. The field on the north bank of Mill Creek east of Eastgate Lion Park is mapped as a Ferruginous hawk breeding area. A smaller Ferruginous hawk breeding area is mapped in the UGA along Yellowhawk Creek. Ring-necked pheasant areas are mapped along Mill Creek, Garrison Creek and Yellowhawk Creek. Shrubsteppe habitat patches are also present throughout the City and UGAs (WDFW 2023).

The aquatic habitats in the City of Walla Walla support a variety of species. The main aquatic priority habitats on non-federal lands in the City are located along the Walla Walla River tributaries. The species range from federally listed to priority, focal, and species of interest identified in the Walla Walla Subbasin Plan. WDFW and the Washington State Department of Natural Resources' (DNR) Natural Heritage Program (NHP) compile and map fish and wildlife habitats throughout the state. Numerous studies focus on specific species and habitat types relevant to the City of Walla Walla. The Priority Habitat and Species (PHS) database provides the most comprehensive information on the presence

and distribution of priority habitats and wildlife species. This PHS provides lists of species and habitats which may occur in Walla Walla County, shown in Table 2.

Table 2. WDFW Designated Priority Habitats and Species that Occur in Walla Walla County

	Species/ Habitats	State Status	Federal Status
Habitats	Aspen Stands		
	Biodiversity Areas & Corridors		
	Eastside Steppe		
	Inland Dunes		
	Juniper Savannah		
	Riparian		
	Shrubsteppe		
	Freshwater Wetlands & Fresh Deepwater		
	Instream		
	Caves		
	Cliffs		
	Snags and Logs		
	Talus		
Fishes	Pacific Lamprey		
	White Sturgeon		
	Leopard Dace	Candidate	
	Umatilla Dace	Candidate	
	Mountain Sucker	Candidate	
	Bull Trout/ Dolly Varden	Candidate *	Threatened *
	Chinook Salmon		Threatened (Upper Columbia Spring run is Endangered)
			Threatened – Lower Columbia
	Coho Salmon		
	Kokanee		
	Rainbow Trout/ Steelhead/ Inland Redband Trout	Candidate **	Threatened **
	Sockeye Salmon		Threatened – Ozette Lake
			Endangered – Snake River
Amphibians	Westslope Cutthroat Trout		
	Margined Sculpin	Sensitive	
	Columbia Spotted Frog	Candidate	
	Rocky Mountain Tailed Frog	Candidate	
Reptiles	Western Toad	Candidate	
	Striped Whipsnake	Candidate	
	Sagebrush Lizard	Candidate	
Birds	American White Pelican	Sensitive	
	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		
	Ferruginous Hawk	Endangered	
	Golden Eagle	Candidate	
	Northern Goshawk	Candidate	
	Prairie Falcon		
	Dusky Grouse		
	Mountain Quail		

	Species/ Habitats	State Status	Federal Status
Mammals	Ring-necked Pheasant		
	Wild Turkey		
	Upland Sandpiper	Endangered	
	E WA breeding occurrences of: Phalaropes, Stilts and Avocets		
	Burrowing Owl	Candidate	
	Flammulated Owl	Candidate	
	Vaux's Swift		
	Black-backed Woodpecker	Candidate	
	Loggerhead Shrike	Candidate	
	Sage Thrasher	Candidate	
	Roosting Concentrations of: Big-brown Bat, Myotis bats, Pallid Bat		
	Townsend's Big-eared Bat	Candidate	
	Black-tailed Jackrabbit	Candidate	
	White-tailed Jackrabbit	Candidate	
	Washington Ground Squirrel	Candidate	Candidate
	Gray Wolf	Endangered	Endangered: only in Western two-thirds of Washington
Invertebrates	Marten		
	Bighorn Sheep		
	Northwest White-tailed Deer		
	Elk		
	Mule Deer		
	(formerly called Rocky Mountain Mule Deer)		
	Columbia Oregonian	Candidate	
	California Floater	Candidate	
	Monarch	Candidate	Candidate
	Western Bumble Bee	Candidate	Candidate
		* Bull Trout only	
		** Steelhead only	

Source: WDFW 2025¹

¹ Priority Habitats and Species List | Washington Department of Fish & Wildlife-<https://wdfw.wa.gov/species-habitats/at-risk/phs/list>

7. REFERENCES

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APPENDIX A. Walla Walla County CAO Update
Best Available Science Review
Final