



Critical Areas Ordinance Update

Gap Analysis

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.

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1. INTRODUCTION

With the passage of the Growth Management Act (GMA), local jurisdictions throughout Washington State, including City of Walla Walla (City), were required to develop policies and regulations to designate and protect critical areas. The GMA and the Revised Code of Washington (RCW) 36.70A.030(11) define critical areas as wetlands, fish and wildlife habitat conservation areas, frequently flooded areas, critical aquifer recharge areas, and geologically hazardous areas. The GMA requires local jurisdictions to periodically review and evaluate their adopted policies and regulations regarding critical areas.

City of Walla Walla adopted the most recent critical areas ordinance (CAO) in 2019. According to the Washington Administrative Code (WAC) 365-195-915, critical area regulations must incorporate best available science (BAS), and any deviations from science-based recommendations must be identified, assessed, and explained. In addition, jurisdictions must give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries. A BAS review for this code update has been prepared as a separate document (Facet 2026).

City of Walla Walla's critical areas ordinance is codified in Chapter 21.04 of the City of Walla Walla's Municipal Code (WWMC). This gap analysis reviews the current critical areas regulations and evaluates gaps in consistency between them and BAS or the GMA. It also includes recommendations for improvements to general aspects of the CAO, such as clarity, consistency, and ease of use. The primary intention of this gap analysis is to help guide the update of the City's critical areas policies and regulations.

1.1 Report Structure

Sections 2 through 7 provide recommendations for updating the City's existing critical areas regulations. Section 2 addresses the general provisions applicable to all critical areas; Sections 3 through 7 address the different types of critical areas covered by the GMA, organized according to their organization in the current code. Each section contains a summary table of recommendations followed by a detailed analysis of the existing code, potential gaps, and recommendations.

2. GENERAL PROVISIONS (WWMC 21.04.005-21.04.140)

This section addresses provisions applicable to all types of critical areas as described in WWMC 21.04.005-21.04.140. Table 1 summarizes the recommended updates.

Table 1. General Provisions review summary.

Code Section	Title	Review Comment and Recommendations	Reason for Recommendation
21.04.005	Purpose	Add No Net Loss and special consideration for anadromous fish	Consistency
21.04.010	Authority	No comments or suggestions	
21.04.015	Applicability	Make Figure 1 more legible or remove it.	Legibility
21.04.020	Definitions	1. Add all critical area definitions consistent with the WAC. 2. Review critical area designations against definitions.	1. Clarity 2. Consistency
21.04.025	Severability	No comments or suggestions	
21.04.030	Jurisdiction – Critical areas	No comments or suggestions	
21.04.035	Critical area maps	Ensure maps are updated accordingly.	Clarity
21.04.040	Best available science	No comments or suggestions	
21.04.045	Administrative procedures	No comments or suggestions	
21.04.050	Fees	No comments or suggestions	
21.04.055	Administrative rules	No comments or suggestions	
21.04.060	Permit processing	No comments or suggestions	
21.04.065	Appeals	No comments or suggestions	
21.04.070	Interpretation	No comments or suggestions	
21.04.075	Relationship to other regulations	No comments or suggestions	
21.04.080	Multiple designations	No comments or suggestions	
21.04.085	Allowed activities	No comments or suggestions	
21.04.090	Reasonable use	1. Note: CAR by a qualified professional is required. 2. Consider adding details to clarify what constitutes reasonable use.	1. BAS 2. Consistency

Code Section	Title	Review Comment and Recommendations	Reason for Recommendation
21.04.095	Critical area reports – General requirements	No comments or suggestions	
21.04.100	Critical area reports – Modifications to requirements	No comments or suggestions	
21.04.105	Mitigation requirements	Review and update language for consistency with the 2008 Federal Mitigation Rule hierarchy	Administrative consistency
21.04.110	Mitigation sequencing	No comments or suggestions	
21.04.115	Mitigation plan requirements	Consider adding requirements for timing, legal protections, and use of native plant species	BAS, clarity
21.04.120	Bonds to ensure mitigation, maintenance and monitoring	No comments or suggestions	
21.04.125	Notice on title	No comments or suggestions	
21.04.130	Building setbacks	Review width requirement	BAS
21.04.135	Critical area inspections	No comments or suggestions	
21.04.140	Unauthorized critical area alterations and enforcement	No comments or suggestions	

2.1 Purpose (21.04.005)

WCC 21.04.005.E: We recommend incorporating the following statements to align with WAC 365-190-080: “to protect all functions and values of critical areas to ensure no net loss of ecological functions and values,” and “to give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries.”

2.2 Applicability (21.04.015)

Figure 1 under WWMC 21.04.015.C is low resolution and difficult to read. Update for better legibility or remove from code.

2.3 Definitions (21.04.020)

We recommend aligning the critical area definitions more closely with WAC 365-190-030 to ensure consistency with state standards. Definitions of critical areas should reflect those provided in the WAC, and all applicable critical area definitions should be provided within the definitions section for clarity and consistency. Additional designation criteria is provided in each critical area code section. Designation information may be incorporated into definitions as appropriate.

Best available science (BAS)

Consider removing text, "Citations of Recommended Sources of Best Available Science for Designating and Protecting Critical Areas" published by the state Office of Community Development." The broader definition of BAS in the WAC allows use of current information that meets BAS standards.

Critical Aquifer Recharge Areas

Recommend updating to align with WAC 365-190-100, which is more detailed than WAC 365-190-030(2).

Erosion hazard areas

Recommend adding general statement from WAC to WWMC definition as shown in underlined text below.

WAC definition: *"Erosion hazard areas" are those areas containing soils which, according to the United States Department of Agriculture Natural Resources Conservation Service Soil Survey Program, may experience significant erosion. Erosion hazard areas also include coastal erosion-prone areas and channel migration zones.*

WWMC definition: *"Erosion hazard areas" — means at least those areas identified by the United States Department of Agriculture National Resources Conservation Service as having a prone to significant erosion, including severe rill and inter-rill erosion hazard.*

Frequently flooded areas

WWMC 21.04.020 does not currently include a definition for Frequently Flooded Areas. It is recommended that this term be defined consistent with WAC 365-190-030(8) and incorporated into the definitions section for clarity and regulatory consistency.

WAC definition: *"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.*

Geologically hazardous areas

The City's definition of geologically hazardous areas is consistent with the WAC. Development types could be added to match the WAC if preferred.

WAC definition: *"Geologically hazardous areas" are areas that because of their susceptibility to erosion, sliding, earthquake, or other geological events, are not suited to siting commercial, residential, or industrial development consistent with public health or safety concerns.*

WWMC definition: *"Geologically hazardous areas" — means 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.*

Groundwater

A portion of the groundwater definition in the WAC 173-100-040 is missing. Recommend adding.

Landslide hazard areas

WAC 365-190-120(6) provides greater detail than the currently referenced definition under WAC 365-190-030(10). Recommend updating to provide more detail.

Water Typing System

Since water types F, Np and Ns are no used to assign stream buffer widths, they are not referenced in WWC 21.04.650 and do not need to be defined.

Wetland Category

Update to reference the current 2014 Ecology Wetland Rating System for Eastern Washington.

Wetlands

Recommend removing delineation methodology from the wetland definition as shown in the strike-through below.

WAC definition: *"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 County or City.

WWMC definition: "Wetlands" — 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.~~

2.4 Critical Area Maps (21.04.035)

WWMC states critical area maps "will be updated as inventories are completed in compliance with the requirements of the Growth Management Act, and additional maps may be added as appropriate." However, the City's critical area maps are not readily accessible through its online resources.

We recommend that the City update all critical area maps with any new data available and that these maps be made easily accessible through the City's website to improve transparency and usability.

2.5 Allowed activities (21.04.085)

For clarity, recommend stating in introductory paragraph that allowed activities are still subject to underlying permit or approval and must be consistent with this chapter. Any new critical area impacts/modification is subject to mitigation sequencing requirements.

City staff noted that property fencing is a recurring issue not adequately addressed in the current code. Recommend adding language to the allowed activities section to provide direction on fencing used in landscaping, farming, and property line marking capacities.

2.6 Reasonable Use (21.04.090)

We recommend noting a critical areas report prepared by a qualified professional must be provided to support the Director's review of reasonable use exception criteria.

Consider adding additional criteria to standardize reasonable use reviews, such as square footage limits and/or neighborhood analyses. This can help standardize the review process for both city staff and applicants.

2.7 Mitigation Requirements (21.04.105)

Review this code section regarding mitigation banking against the 2008 Federal Mitigation Rule hierarchy (Ecology publication #21-06-003 excerpt below for reference). Cities commonly prefer to keep mitigation within city limits. However, when state and federal permits apply, the city may add code language to allow the federally required mitigation approach. Recommend incorporating language to allow off-site mitigation when it is required by other agencies, state or federal, and is demonstrated by support watershed health.

Federal Mitigation Rule hierarchy

The 2008 Federal Mitigation Rule (33 CFR Part 332.3[b] and 40 CFR Part 230.93[b]) lists the preference of mitigation options in the following order.

1. Mitigation bank credits
2. In-lieu fee program credits
3. Permittee-responsible mitigation under a watershed approach
4. Permittee-responsible mitigation through on-site and in-kind mitigation
5. Permittee-responsible mitigation through off-site and/or out-of-kind mitigation

2.8 Mitigation Plan Requirements (21.04.115)

This code section could add additional mitigation plan and plan sheet requirements from Ecology's sample wetland regulations (Ecology publication 22-06-014, Appendix A). Since these requirements apply to all critical areas, only general requirements would be applicable. This may include requirements to:

- 1) Describe the proposed timing of impact and mitigation activities, and
- 2) Proof the mitigation area and any associated buffers are protected by a legal mechanism such as a critical areas tract, conservation easement, and/or Notice on Title.

It is considered best management practice for restoration activities to use native plant species appropriate to the site for revegetation of disturbed or degraded areas. Incorporating locally adapted native plant species also supports resilience to climate change by improving the ability of wetlands to withstand environmental stressors. While it is likely the policy is being applied in practice, the current mitigation requirements do not explicitly mandate the use of native species. The City may choose to incorporate this requirement into code to ensure consistency and strengthen long-term ecological outcomes.

2.9 Building setback (21.04.130)

Currently, a five-foot building setback is required from the edge of all critical area buffers. The intent of the setback is to allow maintenance of a structure without encroaching into protected critical area buffers. The City may consider increasing the standard building setback to fifteen feet and allowing reduction down to five feet when the applicant demonstrates long-term building maintenance can be achieved without encroaching upon the critical area buffer. The City may choose to set a higher standard building setback value and allow reductions through the critical areas report process.

3. CRITICAL AQUIFER RECHARGE AREAS (WWMC 21.04.200-260)

Table 2. Critical Aquifer Recharge Areas review summary.

Code Section	Title	Review Comment and Recommendations	Reason for Recommendation
21.04.200	Critical aquifer recharge areas – Designation	Update to match Ecology guidance	Clarity
21.04.210	Mapping of critical aquifer recharge areas	Update <i>Critical Area Map 1</i> : CARA reference	Clarity
21.04.220	Activities allowed in critical aquifer recharge areas	Add specifications to reduce impacts	Clarification
21.04.230	Critical area report – Additional requirements for critical aquifer recharge areas.	Add mitigation plan / measures to critical area report requirements	BAS
21.04.240	Performance standards – General requirements	No comments or suggestions	
21.04.250	Performance standards – Specific uses	No comments or suggestions	
21.04.260	Uses prohibited in critical aquifer recharge areas	Consider adding a table with additional details	Clarification

3.1 Critical aquifer recharge areas—Designation (21.04.200)

The Washington State Department of Ecology (Ecology) has revised the Critical Aquifer Recharge Area Guidance. The current guidance is *2021 Critical Aquifer Recharge Areas: Guidance Document* (Pub 05-10-028).¹ We recommend adding “current or as revised” when referring to this document.

¹ [2021 Critical Aquifer Recharge Areas: Guidance Document](#)

Also update CARA map reference for consistency with WWMC 21.04.210.

3.2 Mapping of critical aquifer recharge areas (21.04.210)

The map referenced by name in the code (WWMC 21.04.210.A), *Critical Area Map 1: Critical aquifer recharge areas*, was not readily found. Recommend revising the language to more generally reference publicly available CARA maps. Retain provision B (WWMC 21.04.210.B), stating that public CARA maps are advisory, as-is.

3.3 Activities allowed in critical aquifer recharge areas (21.04.220)

Recommend the City add a reference to RCW 90.48 (Water Pollution Control) to ensure consistency with applicable state requirements.

Additionally, the City may impose conditions of approval, as necessary, to prevent groundwater degradation. Such conditions should be based on established prevention, control, and treatment methods, including BAS. Where applicable, all proposals must also comply with water source protection requirements and guidance provided by the Federal Environmental Protection Agency, the Washington State Department of Ecology, the Washington State Department of Health, and the Walla Walla County Health Department. Groundwater quantity and quality protection standards could be located under the performance standards subsection (WWMC 21.04.240).

3.4 Critical Area Report—Additional requirements for critical aquifer recharge areas (21.04.230)

Documentation showing best management practices (BMPs) are implemented or a mitigation plan may be required to address groundwater impacts identified in the hydrogeologic site evaluation, including monitoring, process controls, remediation, and discussion of alternatives. Appropriate BMPs and mitigation measures should be applied. Process needs to ensure that soil analysis for infiltration BMPs is in accordance with (Storm Water Management Model (SWMM) measures to prevent delivery of contaminants to groundwater.

3.5 Uses prohibited in critical aquifer recharge areas (21.04.260)

Currently this code section is similar to Walla Walla County 'Uses prohibited in critical aquifer recharge areas' code. Consider adding 'dry wells on sites used for vehicle repair and servicing or dry cleaners' as stated in Walla Walla County code WWCMC 18.08.260). Recommend retaining general provision 'F' to cover other impactful land uses not listed.

Alternatively, the City could add a table to list prohibited uses by CARA classification. For example, a hazardous liquid transmission pipeline may be prohibited in a Class 1 (1- and 5-Year Wellhead Protection Area) but allowed in Class 2 and 3 CARA when state and federal standards are met.

4. WETLANDS (WWMC 21.04.300-350)

Table 3. Wetlands review summary.

Code Section	Title	Review Comment and Recommendations	Reason for Recommendation
21.04.300	Wetlands critical areas – Designation	Minor descriptive edit recommended to simplify	Clarity
21.04.310	Mapping of wetland areas	Update <i>Critical Area Map 2: Wetlands</i> reference	Clarity
21.04.320	Critical area report – Additional requirements for wetland areas	Check study area width against final wetland buffer widths; update as needed to capture widest buffer.	BAS
21.04.330	Activities allowed in wetlands.	No comments or suggestions	
21.04.340	Performance standards – General requirements	1. Consider adding further detail on disconnected buffers. 2. Add vegetation standards criteria 3. Add GPS option 4. Add small wetland exemption	1. Clarity 2. BAS / clarity 3. BAS / clarity 4. BAS
21.04.341	Signs and fencing of wetlands.	No comments or suggestions	
21.04.342	Performance standards – Wetland buffer averaging	No comments or suggestions	
21.04.343	Performance standards – Wetland buffer increase	No comments or suggestions	
21.04.344	Performance standards – Wetland buffer decrease.	Deletion recommended	BAS
21.04.345	Performance standards – Buffer management plan.	Review for redundancy with general mitigation requirements	Clarity
21.04.346	Performance standards – Specific activities and uses.	1. Passive recreation – consider adding ADA allowance. 2. Stormwater facilities – discourage single-point discharge	1. Administration 2. BAS

Code Section	Title	Review Comment and Recommendations	Reason for Recommendation
21.04.347	Performance standards – Mitigation requirements	Review simplified table (Ecology 2022 recommendations)	BAS / Administration
21.04.348	Performance standards – Wetland mitigation plan	No comments or suggestions	
21.04.350	Wetland mitigation banks	No comments or suggestions	

4.1 Wetland critical areas – Designation (21.04.300)

Generally, the designation and rating descriptions align with best practices and Ecology guidance. Recommend simplifying the 'Category I Wetland' description to align with the level of detail provided in the other category descriptions.

4.2 Mapping of wetlands (21.04.310)

The map referenced by name in the code (WWMC 21.04.310.A), *Critical Area Map 2: Wetlands*, was not readily found. Recommend revising the language to more generally reference publicly available wetland maps. Retain provision B (WWMC 21.04.310.B), stating that public wetland maps are advisory, as-is.

4.3 Critical areas report – Additional requirements for wetland areas (21.04.320)

Since the widest wetland buffer under current City code is 250-feet, recommend updating the distance stated under WWMC 21.04.320.B.3 from 200-feet to 250-feet.

4.4 Performance standards – General requirements (21.04.340)

Disconnected buffers (WWMC 21.04.340.C.2)

Additional detail on what constitutes a significant development is provided in Ecology's Sample Wetland Regulations (Publication # 22-06-014, Appendix A). This information could be added for clarity. An excerpt from Ecology's sample wetland regulations is below:

Functionally Disconnected Buffer Area. Buffers may exclude areas that are functionally and effectively disconnected from the wetland by an existing public or private road or legally established development, as determined by the [Administrator]. Functionally and effectively disconnected means that the road or other significant development blocks the protective measures provided by a buffer.

Significant developments shall include built public infrastructure such as roads and railroads, and private developments such as homes or commercial structures. The [Administrator] shall evaluate whether the interruption will affect the entirety of the buffer. Individual structures may not fully interrupt buffer function. In such cases, the allowable buffer exclusion should be limited in scope to just the portion of the buffer that is affected. Where questions exist regarding whether a development functionally disconnects the buffer, or the extent of that impact, the [Administrator] may require a critical area report to analyze and document the buffer functionality.

Examples of how this guidance has been incorporated into wetland buffer regulations are provided below.

Walla Walla County, in addition to incorporating Ecology's sample regulation language above for specific uses and activities under WWCMC 18.08.345.H, states the following under performance standard - general requirements (WWCMC 18.08.340.C.2):

Buffers shall not include areas that are functionally and effectively disconnected from the wetland by a road or other substantially developed surface of sufficient width and with use characteristics such that buffer functions are not provided.

Skagit County draft code update, words this disconnected buffer provision as follows (SCC 14.24.230.6).

(6) Where a legally established and constructed public roadway, private roads, and legally established development as determined by the Director functionally disconnects a wetland buffer as demonstrated in a critical area report, the Director may approve a modification of the standard buffer width to the edge of the development, provided:

- (a) The isolated part of the buffer does not provide additional protection of the wetland; and*
- (b) The isolated part of the buffer provides insignificant biological, geological, or hydrological buffer functions relating to the wetland; and*
- (c) If the resulting buffer distance is less than 75% of the standard or optional buffer for the applicable wetland category, no further reduction will be allowed.*
- (d) The legally established development includes hard surfaces a minimum of 20 feet wide that completely isolates the project area from the critical area.*

Standard buffer widths (WWMC 21.04.340.C.3)

City code currently requires applicants to restore or rehabilitate disturbed vegetation within the buffer with native plant communities. The City may include an option to apply a wider buffer if vegetation conditions are not brought up to standards. Additionally, the City may consider adding a clear description of what a native plant community represents, such as density or coverage requirements.

Measurement of Wetland buffers (WWMC 21.04.340.C.4)

Consider adding Ecology recommended language to allow GPS-mapping (Publication # 22-06-014, Appendix A).

Wetland delineations will be documented on a ground-verified map using either professional surveying methods or an equivalent professional method using GPS with sub-meter accuracy.

Table 4: Recommended buffer widths

The current City-required buffers are based on Ecology's 2018 buffer guidance (Appendix 8-C) and are consistent with BAS.

Although Ecology's 2018 guidance is part of the BAS-based guidance available, Ecology updated buffer recommendations in 2022 to include additional clarity surrounding buffer table options. The underlying science behind buffer width recommendations in the 2018 and 2022 publications remains the same. Ecology's 2022 buffer recommendations outlines a preferred option (Publication # 22-06-014, Appendix D, Option 1) that includes consideration of a habitat corridor for wetlands with moderate to high habitat scores. This option also requires minimization measures to be applied, or buffer width increased. See Appendix A of this report for both the 2018 and 2022 Ecology wetland buffer guidance.

Small wetlands exemption (*Not Applicable*)

The small wetlands exemption in 2022 Ecology sample (Ecology Publication #22-06-014, Appendix A) does not apply to ecoregions that use the Arid West Regional Supplement (US Army Corps 2008). Ecology guidance states that wetlands in the arid west perform functions at an 'outsized role due to their rarity in the landscape.' Therefore, this is not applicable to small wetlands in the City of Walla Walla.

4.5 Performance standards – Wetland buffer decrease (21.04.344)

Ecology guidance no longer supports outright wetland buffer reductions. Other regulatory mechanisms, such as reasonable use exceptions or function buffer interruptions, may be used to apply lower buffers. If the City continues to apply Ecology's 2018 wetland buffer guidance, then buffer reductions would be limited to guidance on reducing the intensity of impacts from proposed land uses. See Ecology Publication #05-06-008, July 2018 revision excerpt below (8C.2.4).

8C.2.4 Special Conditions for a Possible Reduction in Buffer Widths

8C.2.4.1 Condition 1: Reduction in Buffer Width Based on Reducing the Intensity of Impacts from Proposed Land Uses

The buffer widths recommended for proposed land uses with high-intensity impacts to wetlands can be reduced to those recommended for moderate-intensity impacts under the following conditions:

- For wetlands that score moderate or high for habitat (6 points or more for the habitat functions), the width of the buffer can be reduced if both of the following criteria are met:
 - 1) A relatively undisturbed, vegetated corridor at least 100-feet wide is protected between the wetland and any other Priority Habitats as defined by the Washington State Department of Fish and Wildlife. The latest definitions of priority habitats and their locations are available on the WDFW web site at: <http://wdfw.wa.gov/hab/phshabs.htm>

The corridor must be protected for the entire distance between the wetland and the Priority Habitat by some type of legal protection such as a conservation easement.
 - 2) Measures to minimize the impacts of different land uses on wetlands, such as the examples summarized in Table 8C-8, are applied.
- For wetlands that score less than 6 points for habitat, the buffer width can be reduced to that required for moderate land-use impacts by applying measures to minimize the impacts of the proposed land uses (see examples in Table 8C-8).

Table 8C-8. Examples of measures to minimize impacts to wetlands from proposed change in land use that have high impacts. (This is not a complete list of measures.)

Examples of Disturbance	Activities and Uses that Cause Disturbances	Examples of Measures to Minimize Impacts
Lights	• Parking lots • Warehouses • Manufacturing • Residential	• Direct lights away from wetland
Noise	• Manufacturing • Residential	• Locate activity that generates noise away from wetland
Toxic runoff*	• Parking lots • Roads • Manufacturing • Residential areas • Application of agricultural pesticides • Landscaping	• Route all new, untreated runoff away from wetland while ensuring wetland is not dewatered • Establish covenants limiting use of pesticides within 150 ft of wetland • Apply integrated pest management
Stormwater runoff	• Parking lots • Roads • Manufacturing • Residential areas • Commercial • Landscaping	• Retrofit stormwater detention and treatment for roads and existing adjacent development • Prevent channelized flow from lawns that directly enters the buffer
Change in water regime	• Impermeable surfaces • Lawns • Tilling	• Infiltrate or treat, detain, and disperse into buffer new runoff from impervious surfaces and new lawns
Pets and human disturbance	• Residential areas	• Use privacy fencing; plant dense vegetation to delineate buffer edge and to discourage disturbance using vegetation appropriate for the ecoregion; place wetland and its buffer in a separate tract
Dust	• Tilled fields	• Use best management practices to control dust
* These examples are not necessarily adequate for minimizing toxic runoff if threatened or endangered species are present at the site.		

8C.2.4.2 Condition 2: Reductions in Buffer Widths Where Existing Roads or Structures Lie Within the Buffer

Where a legally established, non-conforming use of the buffer exists (e.g., a road or structure that lies within the width of buffer recommended for that wetland), proposed actions in the buffer may be permitted as long as they do not increase the degree of non-conformity. This means no increase in the impacts to the wetland from activities in the buffer.

For example, if a land use with high impacts (e.g., building an urban road) is being proposed next to a Category II wetland with a moderate level of function for habitat, a 150-foot buffer would be needed to protect functions (see Table 8C-6). If, however, an existing urban road is already present and only 50 feet from the edge of the Category II wetland, the additional 100 feet of buffer may not be needed if the road is being widened. A vegetated buffer on the other side of the road would not help buffer the existing impacts to the wetland from the road. If the existing road is resurfaced or widened (e.g., to add a sidewalk) along the upland edge, without any further roadside development that would increase the degree of non-conformity, the additional buffer is not necessary. The associated increase in impervious surface from widening a road, however, may necessitate mitigation for impacts from stormwater.

If, however, the proposal is to build a new development (e.g., shopping center) along the upland side of the road, the impacts to the wetland and its functions may increase. This would increase the degree of non-conformity. The project proponent would need to provide the additional 100 feet of buffer extending beyond the road or apply buffer averaging (see Section 8C.2.6).

8C.2.4.3 Condition 3: Reduction in Buffer Widths Through an Individual Rural Stewardship Plan

A Rural Stewardship Plan (RSP) is the product of a collaborative effort between rural property owners and a local government to tailor a management plan specific for a rural parcel of land. The goal of the RSP is better management of wetlands than what would be achieved through strict adherence to regulations. In exchange, the landowner gains flexibility in the widths of buffers required, in clearing limits, and in other requirements found in the regulations. For example, dense development in rural residential areas can be treated as having a low level of impact when the development of the site is managed through a locally approved RSP. The voluntary agreement includes provisions for restoration, maintenance, and long-term monitoring and specifies the widths of buffers needed to protect each wetland within the RSP.

4.6 Performance standards – Buffer management plan (21.04.345)

Review and consider if this is beneficial or redundant with mitigation requirements under WWMC 21.04.105 – 115. For example, maintaining dense native plant cover, keeping invasive plant cover low, and requiring five years of monitoring and maintenance are covered in the general mitigation code sections. Mitigation plans are required to propose mitigation consistent with BAS and include a planting plan with species and density (WWMC 21.04.115). WWMC 21.04.105.F states mitigation monitoring shall be required for five years and a monitoring program is required under WWMC 21.04.115.D.

One unique detail under WWMC 21.04.345 is the reference to 'Table 8, Walla Walla County Conservation District native riparian vegetation planting guidelines'. That document was not located in brief online search. Recommend a more general reference to incorporating BAS since specific resources can change over time.

4.7 Performance standards – Specific activities and uses (21.04.346)

Passive recreation (21.04.346.B.1) limits trails to a five-foot width. Consider adding an allowance for wider trails when necessary for ADA compliance.

Stormwater facilities (21.04.346.C) may also note that a single-discharge point should be avoided. Dispersed discharges allow the buffer to provide infiltration and water quality functions over the distance remaining.

4.8 Performance standards – Mitigation requirements (21.04.347)

Table 5: Mitigation ratios for Eastern Washington is from the 2018 Ecology guidance. The 2022 Ecology guidance (Publication # 22-06-014, Appendix E) offers a simplified version of this table. Review and consider adopting (Appendix B of this report). Please note, both 2018 and 2022 options are both considered BAS.

4.9 Performance standards – Wetland mitigation plan (21.04.348)

Recommend additional text to reference Ecology's requirement to select wetland mitigation sites using a watershed approach (Publication #10-06-007). This would align City requirements with state and federal mitigation requirements.

5. MAPPING OF FREQUENTLY FLOODED AREAS (WWMC 21.04.400)

Table 4. Frequently Flooded Areas Review Summary.

Code Section	Title	Review Comment and Recommendations	Reason for Recommendation
21.04.400 (new)	Frequently flooded areas – designation	Add critical area designation	Compliance
21.04.40010	Mapping of Frequently Flooded Areas	Update map reference	Clarity
21.04.420 (new)	Frequently flooded areas- regulation	Add regulation	Compliance

The City may choose to make the updates suggested below or remove this content from Chapter 21.04 and reference Chapter 21.10. This would simplify the code.

5.1 FFA Mapping-Commerce Guidelines (21.04.400-420)

5.1.1 Frequently Flooded Areas Designation (21.04.400 NEW)

It is recommended to designate frequently flooded areas are designated in the critical area ordinance to ensure compliance with state regulations. [WAC 365-190-110]

5.1.2 Mapping of Frequently Flooded Areas (21.04.410 NEW #)

The map referenced by name in the code (WWMC 21.04.400.A), *Critical Area Map 3: Frequently Flooded Areas*, was not readily found. Recommend revising the language to more generally reference publicly available FFA maps. Retain provision B (WWMC 21.04.410.B), stating that public flood hazard maps are advisory, as-is.

5.1.3 Frequently Flooded Areas Regulation (21.04.420 NEW)

Title 15 (Buildings and Construction) and Chapter 21.10 (Floodplain Management) of the City of Walla Walla Code regulate proposed activities adjacent to or within frequently flooded areas. If allowed, any structure permitted in these flood areas, it is subject to the flood-proofing regulations provided in Title 15 and Chapter 21.10.

Many other communities in Washington take a similar approach and regulate areas of special flood hazards using National Flood Insurance Program standards, deeming this sufficient for their frequently flooded areas codes (Commerce 2023). Commerce notes that this approach can meet the minimum requirements without exceptional circumstances. However, Commerce also notes that FEMA maps do

not address all community flood risk and that the frequently flooded area designation should be based on BAS. Commerce, therefore, encourages local governments to consider additional flood risks in their communities and address related regulatory issues in their frequently flooded areas. Ecology invites local governments to exceed FEMA minimum requirements for floodplain management (Ecology n.d.).

FEMA recently completed a flood study updated for Walla Walla County. This includes risk assessment mapping. Those updated maps are included in Appendix C of this report for City reference.

6. GEOLOGICALLY HAZARDOUS AREAS (WWMC 21.04.500-21.04.560)

Table 5. Geologically Hazardous Areas review summary.

Code Section	Title	Review Comment and Recommendations	Reason for Recommendation
21.04.500	Geologically hazardous areas – Designation	Review definitions	Consistency with WAC
21.04.510	Mapping of geologically hazardous areas	Update <i>Critical Area Map 4: Geologic Hazard Areas</i> reference	Clarity
21.04.520	Activities allowed in geologically hazardous areas.	No comments or suggestions	
21.04.530	Critical area report – Additional requirements for geologically hazardous areas.	No comments or suggestions	
21.04.540	Critical area report – Additional requirements for specific geologically hazardous areas	No comments or suggestions	
21.04.550	Performance standards – General Requirements	No comments or suggestions	
21.04.560	Performance standards – Specific hazards	No comments or suggestions	

6.1 Geologically hazardous areas—Designation (21.04.500)

The Walla Walla Municipal Code does not mirror the Washington Administrative Code designations verbatim; however, it generally aligns with the intent and underlying definitions, and in some cases provides greater specificity and detail.

We recommend conducting a comprehensive review of the WAC definitions for all hazard areas to determine whether revisions to the WWMC definitions and/or designations are warranted to ensure consistency and regulatory clarity. WAC 365-190-120 defines Geologically Hazardous Areas as follows:

(1) Geologically hazardous areas include areas susceptible to erosion, sliding, earthquake, or other geological events. They pose a threat to the health and safety of citizens when incompatible commercial, residential, or industrial development is sited in areas of significant hazard.

(2) Some geological hazards can be reduced or mitigated by engineering, design, or modified construction or mining practices so that risks to public health and safety are minimized. When technology cannot reduce risks to acceptable levels, building in geologically hazardous areas must be avoided. The distinction between avoidance and compensatory mitigation should be considered by counties and cities that do not currently classify geological hazards, as they develop their classification scheme.

(3) Areas that are susceptible to one or more of the following types of hazards shall be classified as a geologically hazardous area:

(a) Erosion hazard;

(b) Landslide hazard;

(c) Seismic hazard; or

(d) Areas subject to other geological events such as coal mine hazards and volcanic hazards including: Mass wasting, debris flows, rock falls, and differential settlement.

(4) Counties and cities should assess the risks and classify geologically hazardous areas as either:

(a) Known or suspected risk;

(b) No known risk; or

(c) Risk unknown - data are not available to determine the presence or absence of risk.

(5) Erosion hazard areas include areas likely to become unstable, such as bluffs, steep slopes, and areas with unconsolidated soils. Erosion hazard areas may also include coastal erosion areas: This information can be found in the Washington state coastal atlas available from the department of ecology. Counties and cities may consult with the United States Department of Agriculture Natural Resources Conservation Service for data to help identify erosion hazard areas.

(6) Landslide hazard areas include areas subject to landslides based on a combination of geologic, topographic, and hydrologic factors. They include any areas susceptible to landslide because of any combination of bedrock, soil, slope (gradient), slope aspect, structure, hydrology, or other factors, and include, at a minimum, the following:

(a) Areas of historic failures, such as:

(i) Those areas delineated by the United States Department of Agriculture Natural Resources Conservation Service as having a significant limitation for building site development;

(ii) Those coastal areas mapped as class u (unstable), uos (unstable old slides), and urs (unstable recent slides) in the department of ecology Washington coastal atlas; or

(iii) Areas designated as quaternary slumps, earthflows, mudflows, lahars, or landslides on maps published by the United States Geological Survey or Washington department of natural resources.

(b) Areas with all three of the following characteristics:

(i) Slopes steeper than 15 percent;

(ii) Hillsides intersecting geologic contacts with a relatively permeable sediment overlying a relatively impermeable sediment or bedrock; and

(iii) Springs or groundwater seepage.

(c) Areas that have shown movement during the holocene epoch (from 10,000 years ago to the present) or which are underlain or covered by mass wastage debris of this epoch;

(d) Slopes that are parallel or subparallel to planes of weakness (such as bedding planes, joint systems, and fault planes) in subsurface materials;

(e) Slopes having gradients steeper than 80 percent subject to rockfall during seismic shaking;

(f) Areas potentially unstable as a result of rapid stream incision, stream bank erosion, and undercutting by wave action, including stream channel migration zones;

(g) Areas that show evidence of, or are at risk from snow avalanches;

(h) Areas located in a canyon or on an active alluvial fan, presently or potentially subject to inundation by debris flows or catastrophic flooding; and

(i) Any area with a slope of 40 percent or steeper and with a vertical relief of 10 or more feet except areas composed of bedrock. A slope is delineated by establishing its toe and top and measured by averaging the inclination over at least 10 feet of vertical relief.

(7) Seismic hazard areas must include areas subject to severe risk of damage as a result of earthquake induced ground shaking, slope failure, settlement or subsidence, soil liquefaction, surface faulting, or tsunamis. Settlement and soil liquefaction conditions occur in areas underlain by cohesionless soils of low density, typically in association with a shallow groundwater table. One indicator of potential for future earthquake damage is a record of earthquake damage in the past. Ground shaking is the primary cause of earthquake damage in Washington, and ground settlement may occur with shaking. The strength of ground shaking is primarily affected by:

(a) The magnitude of an earthquake;

(b) The distance from the source of an earthquake;

(c) The type or thickness of geologic materials at the surface; and

(d) The type of subsurface geologic structure.

(8) Other geological hazard areas:

(a) Volcanic hazard areas must include areas subject to pyroclastic flows, lava flows, debris avalanche, or inundation by debris flows, lahars, mudflows, or related flooding resulting from volcanic activity.

(b) Mine hazard areas are those areas underlain by, adjacent to, or affected by mine workings such as audits, gangways, tunnels, drifts, or air shafts. Factors which should be considered include: Proximity to development, depth from ground surface to the mine working, and geologic material.

6.2 Mapping of geologically hazardous areas (21.04.510)

The map referenced by name in the code (WWMC 21.04.510.A), *Critical Area Map 4: Geologically hazardous areas*, was not readily found. Recommend revising the language to more generally reference publicly available geologically hazardous areas maps. Retain provision B (WWMC 21.04.510.B), stating that public geologic hazard area maps are advisory, as-is.

7. FISH AND WILDLIFE HABITAT CONSERVATION AREAS (WWMC 21.04.600 - 671)

Table 6. Fish and Wildlife Habitat Conservation Areas review summary.

21.04.600	Fish and wildlife habitat conservation areas – Designation	Consider adding reference to the 2023 WDFW PHS List.	
21.04.600	Fish and wildlife habitat conservation areas – Designation	Add reference to the 2023 WDFW PHS List	BAS
21.04.610	Fish and wildlife habitat conservation areas – Mapping	Update the map reference	Clarity
21.04.620	Fish and wildlife habitat conservation areas – Water bodies – Allowed uses	No comments or suggestions	
21.04.630	Critical area report – Additional requirements for habitat conservation areas	Increase FWHCA documentation in vicinity of subject property.	BAS
21.04.640	Performance standards – General requirements	No comments or suggestions	

21.04.600	Fish and wildlife habitat conservation areas – Designation	Consider adding reference to the 2023 WDFW PHS List.	
21.04.650	Performance standards – Specific habitats	1. Recommend adding shrubsteppe to the priority habitats listed. 2. Review stream protections against current WDFW recommendations. 3. Clean up table to remove extraneous information and undefined terms.	1. BAS 2. BAS 3. Clarity
21.04.660	Performance standards – Subdivisions	Consider adding habitat corridor review requirements	BAS
21.04.670	Fish and wildlife habitat conservation areas – Piped streams	Consider adding incentives to daylight stream segments	BAS
21.04.671	Fish and wildlife habitat conservation areas – Mitigation standards	No comments or suggestions	
21.04.700	Landfill vicinity development standards	No comments or suggestions	

7.1 Fish and Wildlife Habitat Conservation Areas – Designation (21.04.600)

The Fish and Wildlife Habitat Conservation Areas (FWHCA) designation criteria can be improved by referencing WDFW Priority Habitat and Species (PHS) list current or as amended. This approach ensures CAO designations remain current with evolving state wildlife data without requiring formal ordinance amendment each time the PHS list is updated.

7.2 Fish and Wildlife Habitat Conservation Areas – Mapping (21.04.610)

The map referenced by name in the code (WWMC 21.04.610.A), *Critical Area Map 5: Fish and Wildlife Habitat Conservation Areas*, was not readily found. Recommend revising the language to more generally reference publicly available FWHCA maps. Retain provision B (WWMC 21.04.610.B), stating that public FWHCA maps are advisory, as-is.

7.3 Critical area report – Additional requirements for habitat conservation areas (21.04.630)

21.04.630.B.2 limits documentation of priority habitats and species to within 200 feet of the project area. However, some species are impacted at a distance of more than 200 feet. We recommend increasing this screening area to be more protective and allow full consideration of WDFW management recommendations. The City may establish appropriate screening area on a site-specific basis considering conditions that constitute a significant disturbance, like urban land use.

7.4 Performance standards—Specific habitats. (21.04.650)

Shrubsteppe Habitat

Recommend adding shrubsteppe habitat to this code section. Shrubsteppe is a priority habitat on the WDFW PHS List. WDFW PHS on the web maps several shrubsteppe habitat patches within the City. This habitat also supports other listed species, like Ferruginous hawk.

Riparian habitat areas – BAS summary

Review WDFW BAS synthesis (Rentz et al. 2020) and recommendations for riparian protections summarized in the *Draft Best Available Science Review, Critical Areas Ordinance Update, Walla Walla County*, Section 6.4 (Facet 2026). Current WDFW riparian protection recommendations are based on soil type and dominant site potential tree height (SPTH) after 200 years of growth. Under this SPTH approach, WDFW no longer recommends using a stream classification system based on fish use. All streams are recognized as performing important functions, and the SPTH₂₀₀ model seeks to achieve full ecological function.

However, the City of Walla Walla contains no forested ecosystems and is all mapped by WDFW as a dryland ecosystem. In dryland ecosystems, WDFW recommends first identifying the full extent of the riparian vegetative community. Then overlaying a minimum 100-foot riparian buffer. The wider of the two riparian protection areas would apply on a site-specific basis; this is referred to as the zone of influence. It is commonly applied in non-forested environments like shrubsteppe. Width may alternatively be based on desired pollutant removal efficacy. As stated in WDFW Riparian Ecosystems: Volume 1 (bold emphasis added)(Quinn, Wilhere and Krueger 2020):

*In dryland ecoregions, the width of the riparian ecosystem is based on the ecological function that creates the widest zone of influence. At most sites, this will be either the wood (large and small) or pollutant removal functions. **For grass, herb, shrub, and small tree vegetation types, the zone of influence based on wood, which depends on vegetation height, will be narrower than the zone of influence based on pollutant removal.** Therefore, **if pollutants, including sediments due to ground disturbance, are a concern at a particular site, then riparian ecosystem width should be based on the desired removal efficacy for pollutants created at that site.** If, for instance, surface run-off containing excess nitrogen is a concern and a 95% removal is desired, then the zone of influence is 170 ft (52 m) wide, measured from the*

active channel, see Table 5.4. If pollutant removal is not a concern, then riparian ecosystem width should be based on site-potential vegetation height (i.e., trees or shrubs), which should provide maximum wood and shade for aquatic habitats.

Given this information, the riparian protection widths WDFW recommends for Walla Walla range from 100-feet to 170-feet as measured from the ordinary high water mark or channel migration zone, whichever is greater.

A 100-foot-wide buffer is estimated to achieve 95 percent pollution removal and approximately 85 percent surface nitrogen (Rentz, et al. 2020). RMZ buffer recommendations presume the area is densely vegetated with native plants. WDFW recognizes that this increases existing non-conformity and recommends addressing that through non-conforming use regulations. In summary, a minimum buffer width of 100 feet for all streams aligns with BAS if SPTH/dryland ecosystem widths are not used for RMZ determinations.

The City must review the BAS-based recommendations and determine the best regulatory approach for the City of Walla Walla. We recommend reviewing water-quality buffer functions alongside stormwater management regulations. In general, urban settings are limited by surrounding land uses; review of buffer widths should be paired with consideration of requirements to enhance ecological functions. Currently, regulatory buffers range from 35 to 100 feet, depending on stream type. Most streams in the City currently require a 35-foot buffer. The current approach does not meet the minimum recommendations of the WDFW guidance.

Other Stream Management Recommendations

The following WDFW riparian management recommendations for urban areas should also be considered for implementation (Rentz et al. 2020):

- maintaining and improving functions through regulatory and voluntary means,
- identifying and prioritizing restoration,
- maintaining and improving riparian connections, and
- applying stormwater management.

We recommend reviewing WDFW PHS guidelines to determine appropriate protection measures for streams in Walla Walla and to update buffer width requirements. A minimum 100-foot buffer is recommended for water quality. If the City wants to incorporate nonscientific information as the basis for departing from BAS-recommendations, then the city must comply with WAC 365-195-915 below (bold emphasis added).

WAC 365-195-915. Criteria for including the best available science in developing policies and development regulations.

(1) To demonstrate that the best available science has been included in the development of climate resiliency and critical areas policies and regulations, counties and cities should address each of the following on the record:

(a) The specific policies and development regulations adopted to protect the functions and values of the critical areas at issue.

(b) The relevant sources of best available scientific information included in the decision-making.

(c) Any nonscientific information—including legal, social, cultural, economic, and political information—used as a basis for climate resiliency and critical area policies and regulations that depart from recommendations derived from the best available science. A county or city departing from science-based recommendations should:

(i) Identify the information in the record that supports its decision to depart from science-based recommendations;

(ii) Explain its rationale for departing from science-based recommendations; and

(iii) Identify potential risks to climate resiliency, the functions and values of the critical area or areas at issue, and any additional measures chosen to limit such risks. State Environmental Policy Act (SEPA) review often provides an opportunity to establish and publish the record of this assessment.

(2) Counties and cities should include the best available science in determining whether to grant applications for administrative variances and exemptions from generally applicable provisions in policies and development regulations adopted to protect the functions and values of critical areas. Counties and cities should adopt procedures and criteria to ensure that the best available science is included in every review of an application for an administrative variance or exemption.

7.4.1 Riparian habitat areas (21.04.650.D.2)

To align with BAS, recommend adding channel migration zone or ordinary high water mark, whichever is greater to width measurements provision (b).

Recommend deleting repetitive language from (c). Overlapping critical area buffers are already addressed in (3) below. Also suggest adding language to (c) to clarify when and how buffers are modified to account for existing development that functionally interrupt buffers.

7.4.2 Buffer widths (21.04.650, Table 6)

Recommend applying 100-foot buffer to all streams to align with WDFW dryland ecosystem model as described in the riparian habitat areas – BAS summary above.

Remove waterway category column since it is not used anywhere else in the code and is not defined.

Remove existing conditions/targeted functions from table. This information is not used to determine buffer widths and information may be out-of-date. For example, the methodology for measuring the 'existing riparian average' is not clear and all those widths are less than required buffers. The CREP minimum can be retained as a footnote or moved to a separate code provision. Lastly, stormwater management is regulated under Title 13 – Water and Sewers. Stormwater management can also be noted in the stream buffer regulations under measures recommended for protection.

7.4.3 Buffer modification options (21.04.650.D.4 – 6)

Review buffer modification options in detail once updates to stream/riparian buffers are established. Buffer decreases below the 100-foot minimum recommended for water quality would need to demonstrate water quality is maintained. If buffer averaging is retained, water quality protection should be demonstrated. The City's stormwater design standards can be added to the buffer averaging criteria.

Standard riparian/buffer width recommendation presume a native plant community is present. Therefore, buffer reduction with enhancement is not supported by BAS. Recommend deleting 21.04.650.D.6.

7.5 Performance standards—Subdivisions (21.04.660)

Subdivisions of land may impact wildlife movement and corridors. To aid consideration of habitat corridor impacts during project permitting, the City may add language to protect wildlife corridors, supported by BAS and qualified professional reports.

7.6 Fish and wildlife habitat conservation areas – Piped streams (21.04.670)

Walla Walla may consider adding provisions which provide incentives for daylighting streams as a strategy to promote instream habitat restoration. This would support WDFW's recommendations to identify and prioritize restoration and improve riparian connections.

8. REFERENCES

- Ecology (Washington State Department of Ecology). 2022. "Wetland guidance for critical areas ordinance (CAO) updates, Western and Eastern Washington." *Publication No. 22-06-014. Washington State Department of Ecology, Olympia.*
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APPENDIX A. Guidance on Widths of Buffers (2018 and 2022)

Appendix 8-C

Guidance on Widths of Buffers and Ratios for Compensatory Mitigation for Use with the Western Washington Wetland Rating System

8C.1 Introduction

This appendix provides guidance on widths of buffers, ratios for compensatory mitigation, and other measures for protecting wetlands that are linked to the *Washington State Wetland Rating System for Western Washington: 2014 Update*, Department of Ecology Publication #14-06-029 (October 2014). Refer to Appendix 8-D for guidance for eastern Washington. Appendices 8-C through 8-F have been formatted similar to the main text of this volume (i.e., with a numbering system) to help with organization.

The tables below list the recommended widths of buffers for various alternatives, examples of measures to minimize impacts, and ratios for compensatory mitigation.

- **Table 8C-1.** Width of buffers needed to protect wetlands in western Washington if impacts from land use and wetland functions are NOT incorporated (Buffer Alternative 1). [Page 4]
- **Table 8C-2.** Width of buffers based on wetland category and modified by the intensity of the impacts from changes in proposed land use (Buffer Alternative 2). [Page 5]
- **Table 8C-3.** Types of land uses that can result in high, moderate, and low levels of impacts to adjacent wetlands (used in Buffer Alternatives 2 and 3). [Page 5]
- **Table 8C-4.** Width of buffers needed to protect Category IV wetlands in western Washington (Buffer Alternative 3). [Page 6]
- **Table 8C-5.** Width of buffers needed to protect Category III wetlands in western Washington (Buffer Alternative 3). [Page 6]
- **Table 8C-6.** Width of buffers needed to protect Category II wetlands in western Washington (Buffer Alternative 3). [Page 7]
- **Table 8C-7.** Width of buffers needed to protect Category I wetlands in western Washington (Buffer Alternative 3). [Page 8]
- **Table 8C-8.** Examples of measures to minimize impacts to wetlands from different types of activities. [Page 10]

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- **Table 8C-9.** Comparison of recommended buffer widths for high intensity land uses between Alternative 3 (step-wise scale) and Alternative 3A (graduated scale) based on score for habitat functions [Page 14].
- **Table 8C-10.** Comparison of recommended widths for buffers between Alternative 3 and Alternative 3A for proposed land uses with high impacts with mitigation for impacts. [Page 14]
- **Table 8C-11.** Mitigation ratios for projects in western Washington. [Page 20]

The guidance in this appendix can be used in developing regulations such as critical areas ordinances for protecting and managing the functions and values of wetlands. The recommendations are based on the analysis of the current scientific literature found in Volume 1. The detailed rationale for the recommendations is provided in Appendices 8-E and 8-F.

The recommendations on buffer widths and mitigation ratios are general, and there may be some wetlands for which these recommendations are either too restrictive or not protective enough. The recommendations are based on the assumption that a wetland will be protected only at the scale of the site itself. They do not reflect buffers and ratios that might result from regulations that are developed based on a larger landscape-scale approach.

8C.2 Widths of Buffers

Requiring buffers of a specific width has been one of the primary methods by which local jurisdictions in Washington have protected the functions and values of wetlands.

Generally, buffers are the uplands adjacent to an aquatic resource that can, through various physical, chemical, and biological processes, reduce impacts to wetlands from adjacent land uses. The physical characteristics of buffers (e.g., slope, soils, vegetation, and width) determine how well buffers reduce the adverse impacts of human development. These characteristics are discussed in detail in Chapter 5, Volume 1.

In addition to reducing the impacts of adjacent land uses, buffers also protect and maintain a wide variety of functions and values provided by wetlands. For example, buffers can provide the terrestrial habitats needed by many species of wildlife that use wetlands to meet some of their needs.

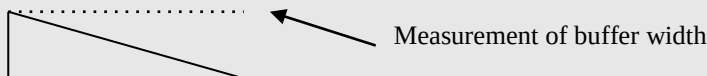
The review of the scientific literature has shown, however, that buffers alone cannot adequately protect all functions that a wetland performs. Additional guidance is, therefore, provided on other ways in which wetlands can be managed and regulated to provide some of the necessary protection that buffers alone do not provide. The following guidance for protecting the functions and values of wetlands is based on their category as determined through the rating system for western Washington.

July 2018 Modified Habitat Score Ranges

Basic assumptions for using the guidance on widths for buffers

Recommendations for widths of buffers assume that:

- The wetland has been categorized using the *Washington State Wetland Rating System for Western Washington: 2014 Update*, Department of Ecology Publication #14-06-029, October 2014.
- The buffer is vegetated with native plant communities that are appropriate for the *ecoregion* or with a plant community that provides similar functions. Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. The U.S. Environmental Protection Agency maintains updated maps of 7 ecoregions that are available at <http://www.epa.gov/naaujydh/pages/models/ecoregions.htm>. Ecoregions currently mapped for Washington are: Coast Range, Puget Lowland, Cascades, Eastern Cascades Slopes and Foothills, North Cascades, Columbia Plateau, Blue Mountains, and Northern Rockies.
- If the vegetation in the buffer is disturbed (grazed, mowed, etc.), proponents planning changes to land use that will increase impacts to wetlands need to rehabilitate the buffer with native plant communities that are appropriate for the ecoregion, or with a plant community that provides similar functions.
- The width of the buffer is measured along the horizontal plane (see drawing below):



- The buffer will remain relatively undisturbed in the future within the width specified.

Three alternatives for protecting the functions of wetlands using buffers are described in the following sections:

- **Buffer Alternative 1.** Width based only on wetland category.
- **Buffer Alternative 2.** Width based on wetland category and the intensity of impacts from proposed changes in land use.
- **Buffer Alternative 3.** Width based on wetland category, intensity of impacts, and wetland functions or special characteristics. This alternative has two options for determining the widths of buffers when they are based on the score for habitat. Alternative 3 provides three buffer widths based on habitat scores, while Alternative 3A provides a graduated scale of widths for buffers based on habitat scores.

The buffer widths recommended for each alternative were based on the review of scientific information in Volume 1. The guidance in this appendix synthesizes the information about the types and sizes of buffers needed to protect the functions and special characteristics of wetlands.

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Modified from Appendix 8-C: Guidance on Buffers and Ratios for Western Washington
Wetlands in Washington State Volume 2 – Protecting and Managing Wetlands
Ecology Publication No. 05-06-008

Appendices 8-C and 8-D do not provide the metric equivalents for buffer widths even though most of the research on buffers uses the metric scale. This decision was made because most local governments use the English Customary measures. For example, a buffer width is set at 50 feet rather than 15 meters.

8C.2.1 **Buffer Alternative 1: Width Based Only on Wetland Category**

This alternative, in which the width of buffers is based only on the category of the wetland, is the simplest (Table 8C-1). The width recommended for each category of wetland in Alternative 1 is the widest recommended for that category in both Alternatives 2 and 3 (discussed below). Alternative 1 provides the least flexibility because many different types of wetlands and types of human impacts are combined. For example, not all wetlands that fall into Category I or II need a 300-foot buffer. If no distinctions are made between the wetlands that fall into Category I or II, all wetlands that fall into these categories have to be protected with a 300-foot buffer so adequate protection is provided for those wetlands that do need a buffer this wide. Also, the widths recommended for this alternative are those needed to protect the wetland from proposed land uses that have the greatest impacts since no distinctions between impacts are made.

Table 8C-1. Width of buffers needed to protect wetlands in western Washington if impacts from land use and wetland functions are NOT incorporated (Buffer Alternative 1).

Category of Wetland	Widths of Buffers
IV	50 ft
III	150 ft
II	300 ft
I	300 ft

8C.2.2 **Buffer Alternative 2: Width Based on Wetland Category and Modified by the Intensity of the Impacts from Proposed Land Use**

The second alternative increases the regulatory flexibility by including the concept that not all proposed changes in land uses have the same level of impact (Table 8C-2). For example, one new residence being built on 5 acres of land near a wetland is expected to have a smaller impact than 20 houses built on the same 5 acres. Three categories of impacts from proposed land uses are outlined: land uses that can create high impacts, moderate impacts, and low impacts to wetlands. Different land uses that can cause these levels of impacts are listed in Table 8C-3.

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Table 8C-2. Width of buffers needed to protect wetlands in western Washington considering impacts of proposed land uses (Buffer Alternative 2).

Category of Wetland	Land Use with Low Impact *	Land Use with Moderate Impact *	Land Use with High Impact*
IV	25 ft	40 ft	50 ft
III	75 ft	110 ft	150 ft
II	150 ft	225 ft	300 ft
I	150 ft	225 ft	300 ft
* See Table 8C-3 below for types of land uses that can result in low, moderate, and high impacts to wetlands.			

Table 8C-3. Types of proposed land use that can result in high, moderate, and low levels of impacts to adjacent wetlands.

Level of Impact from Proposed Change in Land Use	Types of Land Use Based on Common Zoning Designations *
High	• Commercial • Urban • Industrial • Institutional • Retail sales • Residential (more than 1 unit/acre) • Conversion to high-intensity agriculture (dairies, nurseries, greenhouses, growing and harvesting crops requiring annual tilling and raising and maintaining animals, etc.) • High-intensity recreation (golf courses, ball fields, etc.) • Hobby farms
Moderate	• Residential (1 unit/acre or less) • Moderate-intensity open space (parks with biking, jogging, etc.) • Conversion to moderate-intensity agriculture (orchards, hay fields, etc.) • Paved trails • Building of logging roads • Utility corridor or right-of-way shared by several utilities and including access/maintenance road
Low	• Forestry (cutting of trees only) • Low-intensity open space (hiking, bird-watching, preservation of natural resources, etc.) • Unpaved trails • Utility corridor without a maintenance road and little or no vegetation management.
* Local governments are encouraged to create land-use designations for zoning that are consistent with these examples.	

8C.2.3 Buffer Alternative 3: Width Based on Wetland Category, Intensity of Impacts, Wetland Functions, or Special Characteristics

The third alternative provides the most flexibility by basing the widths of buffers on three factors: the wetland category, the intensity of the impacts (as used in Alternative 2), and the functions or special characteristics of the wetland that need to be protected as determined through the rating system. The recommended widths for buffers are shown in Tables 8C-4 to 8C-7. Using this alternative, a wetland may fall into more than one category in the table. For example, an interdunal wetland may be rated a Category III wetland because it is an isolated interdunal wetland, but it may be rated a Category II wetland based on its score for functions.

If a wetland meets more than one of the characteristics listed in Tables 8C-4 to 8C-7, the buffer recommended to protect the wetland is the widest one. For example, if a Category I wetland (Table 8C-7) scores 8 points for habitat and 7 points for water quality functions, a 300-foot buffer is needed for land uses with high impacts because the widths needed to protect habitat are wider than those needed for the other functions.

Table 8C-4. Width of buffers needed to protect Category IV wetlands in western Washington (Buffer Alternative 3 for wetlands scoring less than 16 points for all functions).

Wetland Characteristics	Buffer Widths by Impact of Proposed Land Use	Other Measures Recommended for Protection
Score for all 3 basic functions is less than 16 points	Low - 25 ft Moderate – 40 ft High – 50 ft	No recommendations at this time ¹

¹ No information on other measures for protection was available at the time this document was written. The Washington State Department of Ecology will continue to collect new information for future updates to this document.

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Table 8C-5. Width of buffers needed to protect Category III wetlands in western Washington (Buffer Alternative 3 for wetlands scoring 16 - 19 points for all functions).

Wetland Characteristics	Buffer Widths by Impact of Proposed Land Use	Other Measures Recommended for Protection
Moderate level of function for habitat (score for habitat 6 - 7 points)* *If wetland scores 8-9 habitat points, use Table 8C-6 for Category II buffers	Low - 75 ft Moderate – 110 ft High – 150 ft	No recommendations at this time
Score for habitat 3-5 points	Low - 40 ft Moderate – 60 ft High – 80 ft	No recommendations at this time

1

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Table 8C-6. Width of buffers needed to protect Category II wetlands in western Washington (Buffer Alternative 3 for wetlands scoring 20 - 22 points for all functions or having the “Special Characteristics” identified in the rating system).

Wetland Characteristics	Buffer Widths by Impact of Proposed Land Use (Apply most protective if more than one criterion is met.)	Other Measures Recommended for Protection
High level of function for habitat (score for habitat 8 - 9 points)	Low - 150 ft Moderate – 225 ft High – 300 ft	Maintain connections to other habitat areas
Moderate level of function for habitat (score for habitat 6 - 7 points)	Low - 75 ft Moderate – 110 ft High – 150 ft	No recommendations at this time ²
High level of function for water quality improvement and low for habitat (score for water quality 8 - 9 points; habitat less than 6 points)	Low - 50 ft Moderate – 75 ft High – 100 ft	No additional surface discharges of untreated runoff
Estuarine	Low - 75 ft Moderate – 110 ft High – 150 ft	No recommendations at this time ²
Interdunal	Low - 75 ft Moderate – 110 ft High – 150 ft	No recommendations at this time ²
Not meeting above characteristics	Low - 50 ft Moderate – 75 ft High – 100 ft	No recommendations at this time ²

² See footnote on the previous page.

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Table 8C-7. Width of buffers needed to protect Category I wetlands in western Washington (Buffer Alternative 3 for wetlands scoring 23 points or more for all functions or having the “Special Characteristics” identified in the rating system).

Wetland Characteristics	Buffer Widths by Impact of Proposed Land Use (Apply most protective if more than one criterion is met)	Other Measures Recommended for Protection
Wetlands Of High Conservation Value	Low - 125 ft Moderate – 190 ft High – 250 ft	No additional surface discharges to wetland or its tributaries No septic systems within 300 ft of wetland Restore degraded parts of buffer
Bogs	Low - 125 ft Moderate – 190 ft High – 250 ft	No additional surface discharges to wetland or its tributaries Restore degraded parts of buffer
Forested	Buffer width to be based on score for habitat functions or water quality functions	If forested wetland scores high for habitat, need to maintain connections to other habitat areas Restore degraded parts of buffer
Estuarine	Low - 100 ft Moderate – 150 ft High – 200 ft	No recommendations at this time ³
Wetlands in Coastal Lagoons	Low - 100 ft Moderate – 150 ft High – 200 ft	No recommendations at this time ³
High level of function for habitat (score for habitat 8 - 9 points)	Low – 150 ft Moderate – 225 ft High – 300 ft	Maintain connections to other habitat areas Restore degraded parts of buffer
Interdunal wetland with high level of function for habitat (score for habitat 8 - 9 points).	Low – 150 ft Moderate – 225 ft High – 300 ft	Maintain connections to other habitat areas Restore degraded parts of buffer
Moderate level of function for habitat (score for habitat 6 - 7 points)	Low – 75 ft Moderate – 110 ft High – 150 ft	No recommendations at this time ³
High level of function for water quality improvement (8 – 9 points) and low for habitat (less than 6 points)	Low – 50 ft Moderate – 75 ft High – 100 ft	No additional surface discharges of untreated runoff
Not meeting any of the above characteristics	Low – 50 ft Moderate – 75 ft High – 100 ft	No recommendations at this time ³

³ See footnote on page 6.

8C.2.4 Special Conditions for a Possible Reduction in Buffer Widths

8C.2.4.1 Condition 1: Reduction in Buffer Width Based on Reducing the Intensity of Impacts from Proposed Land Uses

The buffer widths recommended for proposed land uses with high-intensity impacts to wetlands can be reduced to those recommended for moderate-intensity impacts under the following conditions:

- For wetlands that score moderate or high for habitat (6 points or more for the habitat functions), the width of the buffer can be reduced if both of the following criteria are met:
 - 1) A relatively undisturbed, vegetated corridor at least 100-feet wide is protected between the wetland and any other Priority Habitats as defined by the Washington State Department of Fish and Wildlife. The latest definitions of priority habitats and their locations are available on the WDFW web site at: <http://wdfw.wa.gov/hab/phshabs.htm>)

The corridor must be protected for the entire distance between the wetland and the Priority Habitat by some type of legal protection such as a conservation easement.
 - 2) Measures to minimize the impacts of different land uses on wetlands, such as the examples summarized in Table 8C-8, are applied.
- For wetlands that score less than 6 points for habitat, the buffer width can be reduced to that required for moderate land-use impacts by applying measures to minimize the impacts of the proposed land uses (see examples in Table 8C-8).

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Table 8C-8. Examples of measures to minimize impacts to wetlands from proposed change in land use that have high impacts. (This is not a complete list of measures.)

Examples of Disturbance	Activities and Uses that Cause Disturbances	Examples of Measures to Minimize Impacts
Lights	• Parking lots • Warehouses • Manufacturing • Residential	• Direct lights away from wetland
Noise	• Manufacturing • Residential	• Locate activity that generates noise away from wetland
Toxic runoff*	• Parking lots • Roads • Manufacturing • Residential areas • Application of agricultural pesticides • Landscaping	• Route all new, untreated runoff away from wetland while ensuring wetland is not dewatered • Establish covenants limiting use of pesticides within 150 ft of wetland • Apply integrated pest management
Stormwater runoff	• Parking lots • Roads • Manufacturing • Residential areas • Commercial • Landscaping	• Retrofit stormwater detention and treatment for roads and existing adjacent development • Prevent channelized flow from lawns that directly enters the buffer
Change in water regime	• Impermeable surfaces • Lawns • Tilling	• Infiltrate or treat, detain, and disperse into buffer new runoff from impervious surfaces and new lawns
Pets and human disturbance	• Residential areas	• Use privacy fencing; plant dense vegetation to delineate buffer edge and to discourage disturbance using vegetation appropriate for the ecoregion; place wetland and its buffer in a separate tract
Dust	• Tilled fields	• Use best management practices to control dust
* These examples are not necessarily adequate for minimizing toxic runoff if threatened or endangered species are present at the site.		

8C.2.4.2 Condition 2: Reductions in Buffer Widths Where Existing Roads or Structures Lie Within the Buffer

Where a legally established, non-conforming use of the buffer exists (e.g., a road or structure that lies within the width of buffer recommended for that wetland), proposed actions in the buffer may be permitted as long as they do not increase the degree of non-conformity. This means no increase in the impacts to the wetland from activities in the buffer.

For example, if a land use with high impacts (e.g., building an urban road) is being proposed next to a Category II wetland with a moderate level of function for habitat, a 150-foot buffer would be needed to protect functions (see Table 8C-6). If, however, an existing urban road is already present and only 50 feet from the edge of the Category II wetland, the additional 100 feet of buffer may not be needed if the road is being widened. A vegetated buffer on the other side of the road would not help buffer the existing impacts to the wetland from the road. If the existing road is resurfaced or widened (e.g., to add a sidewalk) along the upland edge, without any further roadside development that would increase the degree of non-conformity, the additional buffer is not necessary. The associated increase in impervious surface from widening a road, however, may necessitate mitigation for impacts from stormwater.

If, however, the proposal is to build a new development (e.g., shopping center) along the upland side of the road, the impacts to the wetland and its functions may increase. This would increase the degree of non-conformity. The project proponent would need to provide the additional 100 feet of buffer extending beyond the road or apply buffer averaging (see Section 8C.2.6).

8C.2.4.3 Condition 3: Reduction in Buffer Widths Through an Individual Rural Stewardship Plan

A Rural Stewardship Plan (RSP) is the product of a collaborative effort between rural property owners and a local government to tailor a management plan specific for a rural parcel of land. The goal of the RSP is better management of wetlands than what would be achieved through strict adherence to regulations. In exchange, the landowner gains flexibility in the widths of buffers required, in clearing limits, and in other requirements found in the regulations. For example, dense development in rural residential areas can be treated as having a low level of impact when the development of the site is managed through a locally approved RSP. The voluntary agreement includes provisions for restoration, maintenance, and long-term monitoring and specifies the widths of buffers needed to protect each wetland within the RSP.

8C.2.5 Conditions for Increasing the Width of, or Enhancing, the Buffer

8C.2.5.1 Condition 1: Buffer is Not Vegetated with Plants Appropriate for the Region

The recommended widths for buffers are based on the assumption that the buffer is vegetated with a native plant community appropriate for the ecoregion or with one that performs similar functions. If the existing buffer is unvegetated, sparsely vegetated, or vegetated with invasive species that do not perform needed functions, the buffer should either be planted to create the appropriate plant community or the buffer should be widened to ensure that adequate functions of the buffer are provided. Generally, improving the vegetation will be more effective than widening the buffer.

8C.2.5.2 Condition 2: Buffer Has a Steep Slope

The review of the literature (Volume 1) indicates that the effectiveness of buffers at removing pollutants before they enter a wetland decreases as the slope increases. If a buffer is to be based on the score for its ability to improve water quality (see Tables 8C-4 through 8C-7) rather than habitat or other criteria, then the buffer should be increased by 50% if the slope is greater than 30% (a 3-foot rise for every 10 feet of horizontal distance).

8C.2.5.3 Condition 3: Buffer Is Used by Species Sensitive to Disturbance

If the wetland provides habitat for a species that is particularly sensitive to disturbance (such as a threatened or endangered species), the width of the buffer should be increased to provide adequate protection for the species based on its particular, life-history needs. Some buffer requirements for priority species are available on the Washington State Department of Fish and Wildlife web page (<http://wdfw.wa.gov/hab/phsrecs.htm>). The list of priority species for vertebrates is at <http://wdfw.wa.gov/hab/phsvert.htm>; for invertebrates it is at <http://wdfw.wa.gov/hab/phsinvrt.htm>. Information on the buffer widths needed by some threatened, endangered, and sensitive species of wildlife is provided in Appendix 8-H.

8C.2.6 Buffer Averaging

The widths of buffers may be averaged if this will improve the protection of wetland functions, or if it is the only way to allow for reasonable use of a parcel. There is no scientific information available to determine if averaging the widths of buffers actually protects functions of wetlands. The authors have concluded that averaging could be allowed in the following situations:

Averaging may not be used in conjunction with any of the other provisions for reductions in buffers (listed above).

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- Averaging to **improve wetland protection** may be permitted when all of the following conditions are met:
 - The wetland has significant differences in characteristics that affect its habitat functions, such as a wetland with a forested component adjacent to a degraded emergent component or a “dual-rated” wetland with a Category I area adjacent to a lower rated area
 - The buffer is increased adjacent to the higher-functioning area of habitat or more sensitive portion of the wetland and decreased adjacent to the lower-functioning or less sensitive portion
 - The total area of the buffer after averaging is equal to the area required without averaging
 - The buffer at its narrowest point is never less than 3/4 of the required width
- Averaging to **allow reasonable use** of a parcel may be permitted when all of the following are met:
 - There are no feasible alternatives to the site design that could be accomplished without buffer averaging
 - The averaged buffer will not result in degradation of the wetland’s functions and values as demonstrated by a report from a qualified wetland professional (see Appendix 8-G for a definition of a qualified wetland professional)
 - The total buffer area after averaging is equal to the area required without averaging
 - The buffer at its narrowest point is never less than 3/4 of the required width

8C.2.7 Modifying Buffer Widths in Alternative 3 Using a Graduated Scale for the Habitat Functions (Alternative 3A)

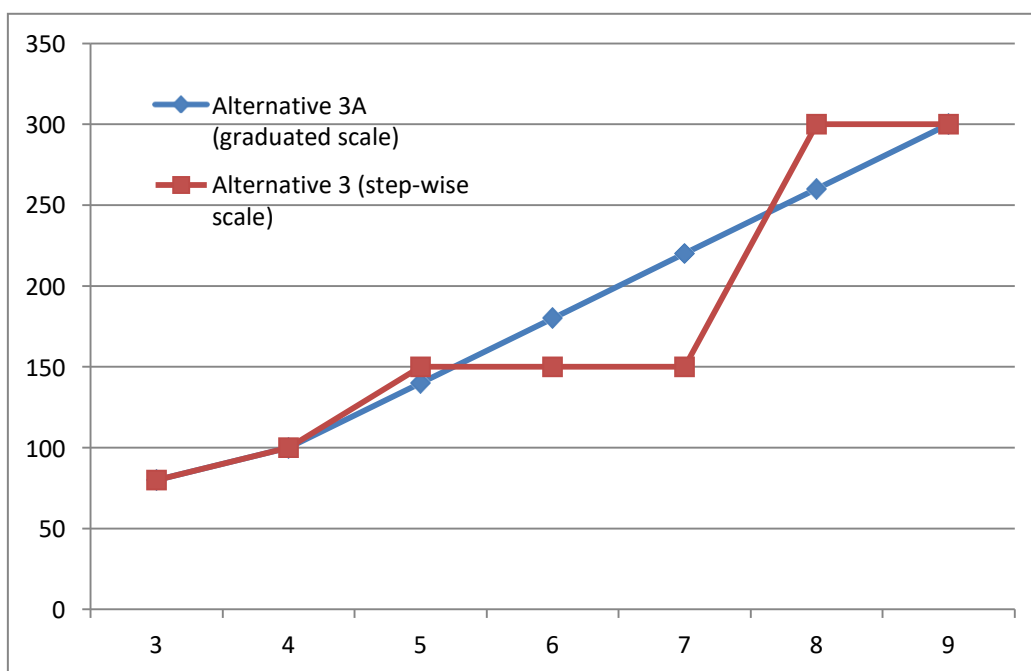
Alternative 3 contains recommendations for protecting the habitat functions of wetlands using only three groupings of scores (3-4, 5-7, 8-9). As a result, a one-point difference between 4 and 5 and between 7 and 8 can result in a 50-foot increase in the width of a buffer around a wetland. The habitat scores were divided into three groups to simplify the regulations based on this guidance.

Such a large increase in width with a one-point increase in the habitat score may be contentious. A jurisdiction may wish to reduce the increments in the widths for buffers by developing a more graduated (but inherently more complicated) scale based on the scores for habitat. Table 8C-9 provides one example of a graduated scale for widths of buffers where the width increases for every one point increase in the habitat score.

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Table 8C-9. Comparison of widths for buffers in Alternatives 3 (step-wise scale) and 3A (graduated scale) for proposed land uses with high impacts based on the score for habitat functions in western Washington

Points for Habitat from Wetland Rating Form	3	4	5	6	7	8	9
Alternative 3	80	100	150	150	150	300	300
Alternative 3A	80	100	140	180	220	260	300



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Other scales are possible as long as they keep within the limits established from the scientific information currently available: wetlands with scores for habitat that are higher than 7 points need buffers that are at least 300 feet wide; wetlands with a score of 5-7 points need buffers of at least 150 feet; and wetlands with a score 3-4 points need buffers that are at least 80 feet wide.

These buffer widths can be further reduced by 25 percent if a proposed project with high impacts implements the mitigation measures such as those described in Table 8C-8. The measures are part of “Condition 1” in Section 8C.2.4 (Special Conditions for a Possible Reduction in Buffer Widths). The buffer widths under Buffer Alternatives 3 and 3A, and the corresponding 25 percent reduction (per buffer reduction condition 1) are shown in Table 8C-10.

Table 8C-10. Comparison of widths for buffers in Alternatives 3 (step-wise scale) and 3A (graduated scale) for proposed land uses with high impacts based on the score for habitat functions in western Washington if the impacts are mitigated.

Points for Habitat from Wetland Rating Form	3	4	5	6	7	8	9
Alternative 3 (with impact-reducing measures)	60	75	110	110	110	225	225
Alternative 3A (with impact-reducing measures)	60	75	105	135	165	195	225

Alternatives 3 and 3A represent two separate approaches for determining widths of buffers for wetlands scoring between 5 and 8 points for the habitat functions. Local governments should select one of the two approaches and should not hybridize the approaches or adopt both at the same time.

Appendix D. Buffer Approaches for Eastern Washington

Option 1

Table 1. Wetland buffer width requirements, in feet, if Table 2 is implemented and a habitat corridor is provided

Category of wetland	Habitat Score 3-5 points (corridor not required)	Habitat Score 6-7 points	Habitat Score 8-9 points	Buffer width based on special characteristics
Category I & II: Based on rating of wetland functions (and not listed below)	75	110	150	NA
Category I & II: Forested	75	110	150	NA
Category I: Bogs, calcareous fens, and Wetlands of High Conservation Value	NA	NA	NA	190
Category I: Alkali	NA	NA	NA	150
Category II: Vernal pool	NA	NA	NA	150
Category III	60	110	150	NA
Category IV	40	40	40	NA

Impact minimization measures

Developments that produce the listed disturbances and are requesting a buffer reduction are required to address the disturbance through the use of applicable minimization measures.

This is not a complete list of measures, nor is every example measure required. Though not every measure is required, all effort should be made to implement as many measures as possible. Regulatory staff should determine, in coordination with the applicant, which measures are applicable and practicable.

Table 2. Impact minimization measures

Examples of disturbance	Activities and uses that cause disturbances	Examples of measures to minimize impacts
Lights	• Parking lots • Commercial/Industrial • Residential • Recreation (e.g., athletic fields) • Agricultural buildings	• Direct lights away from wetland • Only use lighting where necessary for public safety and keep lights off when not needed • Use motion-activated lights • Use full cut-off filters to cover light bulbs and direct light only where needed • Limit use of blue-white colored lights in favor of red-amber hues • Use lower-intensity LED lighting • Dim light to the lowest acceptable intensity
Noise	• Commercial • Industrial • Recreation (e.g., athletic fields, bleachers, etc.) • Residential • Agriculture	• Locate activity that generates noise away from wetland • Construct a fence to reduce noise impacts on adjacent wetland and buffer • Plant a strip of dense shrub vegetation adjacent to wetland buffer
Toxic runoff	• Parking lots • Roads • Commercial/Industrial • Residential areas • Application of pesticides • Landscaping • Agriculture	• Route all new, untreated runoff away from wetland while ensuring wetland is not dewatered • Establish covenants limiting use of pesticides within 150 ft. of wetland • Apply integrated pest management (Note: These examples are not necessarily adequate for minimizing toxic runoff if threatened or endangered species are present at the site.)

Examples of disturbance	Activities and uses that cause disturbances	Examples of measures to minimize impacts
Stormwater runoff	• Parking lots • Roads • Residential areas • Commercial/industrial • Recreation • Landscaping/lawns • Other impermeable surfaces, compacted soil, etc.	• Retrofit stormwater detention and treatment for roads and existing adjacent development • Prevent channelized or sheet flow from lawns that directly enters the buffer • Infiltrate or treat, detain, and disperse new runoff from impervious surfaces and lawns
Pets and human disturbance	• Residential areas • Recreation	• Use privacy fencing • Plant dense native vegetation to delineate buffer edge and to discourage disturbance • Place wetland and its buffer in a separate tract • Place signs around the wetland buffer every 50-200 ft., and for subdivisions place signs at the back of each residential lot • When platting new subdivisions, locate greenbelts, stormwater facilities, or other lower-intensity land uses adjacent to wetland buffers
Dust	• Tilled fields • Roads	• Use best management practices to control dust

Table 3. Wetland buffer width requirements, in feet, for applicants not providing a habitat corridor or implementing measures in Table 2

Category of wetland	Habitat score 3-5 points	Habitat score 6-7 points	Habitat score 8-9 points	Buffer width based on special characteristics
Category I & II: Based on rating of wetland functions (and not listed below)	100	150	200	NA
Category I & II: Forested	100	150	200	NA
Category I: Bogs, calcareous fens, and Wetlands of High Conservation Value	NA	NA	NA	250
Category I: Alkali	NA	NA	NA	200
Category II: Vernal pool	NA	NA	NA	200
Category III	80	150	200	NA
Category IV	50	50	50	NA

Conditions for implementing Tables 1, 2, and 3

1. Wetlands that score 6 points or more for habitat function: the buffers in Table 1 can be used only if all of the following criteria are met:
 - a. A relatively undisturbed, vegetated corridor at least 100 feet wide is protected between the wetland and:
 - i. A legally protected, relatively undisturbed and vegetated area (e.g., Priority Habitats, compensatory mitigation sites, wildlife areas/refuges, national, county, and state parks where they have management plans with identified areas designated as Natural, Natural Forest, or Natural Area Preserve, or
 - ii. An area that is the site of a Watershed Project identified within, and fully consistent with, a Watershed Plan as defined by RCW 89-08-460, or
 - iii. An area where development is prohibited according to the provisions of the local shoreline master program, or
 - iv. An area with equivalent habitat quality that has conservation status in perpetuity, in consultation with WDFW.
 - b. The corridor is permanently protected for the entire distance between the wetland and the shoreline or legally protected area by a conservation easement, deed restriction, or other legal means.
 - c. Presence or absence of the shoreline or Priority Habitat must be confirmed by a qualified biologist or shoreline Administrator.
 - d. The measures in Table 2 are implemented, as applicable, to minimize the impacts of the adjacent land uses.
2. For wetlands that score 5 or fewer habitat points, only the measures in Table 2 are required for the use of the buffers in Table 1.
3. If an applicant does not apply the mitigation measures in Table 2 or is unable to provide a protected corridor, then the buffers in Table 3 shall be used.
4. The buffer widths in Tables 1 and 3 assume that the buffer is vegetated with a native plant community appropriate for the ecoregion. If the existing buffer is un-vegetated, sparsely vegetated, or vegetated with invasive species that do not perform needed functions, the buffer must either be planted to create the appropriate native plant community or be widened to ensure that the buffer provides adequate functions to protect the wetland.

Note: An expanded table with graduated buffer widths based on habitat score is also outlined in the [July 2018 Appendix 8-D](#)⁷⁷ of *Wetlands in Washington State, Volume 2*. This is an approach that assigns unique buffer widths to each habitat score in seven increments. It is a gradual increase in buffer width with each point. Compared to Option 1, this avoids a marked increase in buffer width resulting from an increase of one point in the habitat score.

Option 2

Table 1. Width of buffers, in feet, needed to protect wetlands from impacts of proposed land uses (used with Table 2)

Category of wetland	Land use with low impact*	Land use with moderate impact*	Land use with high impact*
I	125	190	250
II	100	150	200
III	75	110	150
IV	25	40	50

*See Table 2 below for types of land uses that can result in low, moderate, and high impacts to wetlands

Table 2. Levels of impacts from proposed land use types

[Local governments are encouraged to ensure the uses in this table match the uses specified in their development and land use regulations and are consistent with the principles in this example.]

Level of impact from proposed land use	Types of land use
High	• Commercial • Urban • Industrial • Institutional • Mixed-use developments • Residential (more than 1 unit/acre) • Roads: federal and state highways, including on-ramps and exits, state routes, and other roads associated with high-impact land uses • Railroads • Agriculture with high-intensity activities (dairies, nurseries, greenhouses, growing and harvesting crops requiring annual tilling, raising and maintaining animals, etc.)

⁷⁷ <https://apps.ecology.wa.gov/publications/parts/0506008part4.pdf>

Level of impact from proposed land use	Types of land use
	• Open/recreational space with high-intensity uses (golf courses, ball fields, etc.) • Solar farms (utility scale)
Moderate	• Residential (1 unit/acre or less) • Roads: Forest Service roads and roads associated with moderate-impact land uses • Open/recreational space with moderate-intensity uses (parks with paved trails or playgrounds, biking, jogging, etc.) • Agriculture with moderate-intensity uses (orchards, hay fields, light or rotational grazing, etc.) • Utility corridor or right-of-way used by one or more utilities and including access/maintenance • Wind farm
Low	• Natural resource lands (forestry/silviculture—cutting of trees only, not land clearing and removing stumps) • Open/recreational space with low-intensity uses (unpaved trails, hiking, birdwatching, etc.) • Utility corridor without a maintenance road and little or no vegetation management • Cell tower

Option 3

Table 1. Wetland buffer width requirements, in feet, based solely on wetland category

Category of wetland	Buffer width
I	250
II	200
III	150
IV	50

APPENDIX B. Ratios for Compensatory
Mitigation for Use with the
Eastern Washington Wetland
Rating System (2018 and 2022)

8C.3 Ratios for Compensatory Mitigation

When the acreage required for compensatory mitigation is divided by the acreage of impact, the result is a number known variously as a *replacement*, *compensation*, or *mitigation* ratio. Compensatory mitigation ratios are used to help ensure that compensatory mitigation actions are adequate to offset unavoidable wetland impacts by requiring a greater amount of mitigation area than the area of impact. Requiring greater mitigation area helps compensate for the risk that a mitigation action will fail and for the time lag that occurs between the wetland impact and achieving a fully functioning mitigation site.

8C.3.1 Definitions of Types of Compensatory Mitigation

The ratios presented are based on the type of compensatory mitigation proposed (e.g., restoration, creation, and enhancement). In its *Regulatory Guidance Letter 02-02*, the U.S. Army Corps of Engineers provided definitions for these types of compensatory mitigation. For consistency, the authors of this document use the same definitions which are provided below.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a former or degraded wetland. For the purpose of tracking net gains in wetland acres, restoration is divided into:

- **Re-establishment.** The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural or historic functions to a **former** wetland. Re-establishment results in a gain in wetland acres (and functions). Activities could include removing fill material, plugging ditches, or breaking drain tiles.
- **Rehabilitation.** The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural or historic functions of a **degraded** wetland. Rehabilitation results in a gain in wetland function but does not result in a gain in wetland acres. Activities could involve breaching a dike to reconnect wetlands to a floodplain or return tidal influence to a wetland.

Creation (Establishment): The manipulation of the physical, chemical, or biological characteristics present to develop a wetland on an upland or deepwater site where a wetland did not previously exist. Establishment results in a gain in wetland acres. Activities typically involve excavation of upland soils to elevations that will produce a wetland hydroperiod, create hydric soils, and support the growth of hydrophytic plant species.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of a wetland site to heighten, intensify, or improve specific function(s) or to change the growth stage or composition of the vegetation present. Enhancement is undertaken for specified purposes such as water quality improvement, flood water retention, or wildlife

July 2018 Modified Habitat Score Ranges

habitat. Enhancement results in a change in some wetland functions and can lead to a decline in other wetland functions, but does not result in a gain in wetland acres. Activities typically consist of planting vegetation, controlling non-native or invasive species, modifying site elevations or the proportion of open water to influence hydroperiods, or some combination of these activities.

Protection/Maintenance (Preservation): Removing a threat to, or preventing the decline of, wetland conditions by an action in or near a wetland. This includes the purchase of land or easements, repairing water control structures or fences, or structural protection such as repairing a barrier island. This term also includes activities commonly associated with the term *preservation*. Preservation does not result in a gain of wetland acres, may result in a gain in functions, and will be used only in exceptional circumstances.

Distinction between rehabilitation and enhancement

The distinction between rehabilitation and enhancement as defined above is not clear-cut and can be hard to understand. Actions that rehabilitate or enhance wetlands span a continuum of activities that cannot be defined by specific criteria.

Rehabilitation ←————→ *Enhancement*

In general, rehabilitation involves actions that are more sustainable and that reinstate environmental processes, both at the site and landscape scale (e.g., reinstating hydrologic processes in a diked floodplain by breaching the dikes). Rehabilitation actions often focus on restoring environmental processes that have been disturbed or altered by previous or ongoing, human activity. Ecology further defines *rehabilitation* as:

- Actions that restore the original hydrogeomorphic (HGM) class, or subclass, to a wetland whose current HGM class, or subclass, has been changed by human activities
- Actions that restore the water regime that was present and maintained the wetland before human activities changed it

Any other actions taken in existing wetlands would be considered *enhancement*. Enhancement typically involves actions that provide gains in only one or a few functions and can lead to a decline in other functions. Enhancement actions often focus on structural or superficial improvements to a site and generally do not address larger-scale environmental processes.

For example, a wetland that was once a forested, riverine wetland was changed to a depression, emergent wetland by the construction of a dike and through grazing. Rehabilitating the wetland would involve breaching the dike so the wetland becomes a riverine wetland again, discontinuing the grazing, and reforesting the area. Discontinuing the grazing and reforesting the wetland without re-establishing the links to the riverine system would be considered enhancement.

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Basic assumptions for using the guidance on ratios

- The ratios are for a compensatory mitigation project that is concurrent with impacts to wetlands. If impacts are to be mitigated by using an approved and established mitigation bank, the rules and ratios applicable to the bank should be used.
- The ratios are based on the assumption that the category (based on the rating system for western Washington) and hydrogeomorphic (HGM) class or subclass of the wetland proposed as compensation are the same as the category and HGM class or subclass of the affected wetland (e.g., impacts to a Category II riverine wetland are compensated by creating, restoring, or enhancing a Category II riverine wetland).
- Ratios for projects in which the category and HGM class or subclass of wetlands proposed as compensation is not the same as that of the wetland affected will be determined on a case-by-case basis using the recommended ratios as a starting point. The ratios could be higher in such cases.
- The ratio for using rehabilitation as compensation is 2 times that for using re-establishment or creation (R/C) (2 acres of rehabilitation are equivalent to 1 acre of R/C). The ratio for using enhancement as compensation is 4 times that for using R/C (4 acres of enhancement are equivalent to 1 acre of R/C).
- Re-establishment or creation can be used in combination with rehabilitation or enhancement. For example, 1 acre of impact to a Category III wetland would require 2 acres of R/C. If an applicant provides 1 acre of R/C (i.e., replacing the lost acreage at a 1:1 ratio), the remaining 1 acre of R/C necessary to compensate for the impact could be substituted with 2 acres of rehabilitation or 4 acres of enhancement.
- Generally the use of enhancement alone as compensation is discouraged. Using enhancement in combination with the replacement of wetland area at a minimum of 1:1 through re-establishment or creation is preferred.

These ratios were developed to provide a starting point for further discussions with each proponent of compensatory mitigation. They are based on the observations of the success and risk of compensatory mitigation, as reviewed in Volume 1, and do not represent the specific risk or opportunities of any individual project.

As noted above, the ratios for compensatory mitigation are based on the assumption that the category and hydrogeomorphic (HGM) class or subclass of the affected wetland and the mitigation wetland are the same. The ratios may be adjusted either up or down if the category or HGM class or subclass of the wetland proposed for compensation is different. For example, ratios may be lower if impacts to a Category IV wetland are to be mitigated by creating a Category II wetland. The same is true for impacts to wetlands that currently would be considered *atypical* (see definition below).

Also, compensatory mitigation should not result in the creation, restoration, or enhancement of an atypical wetland. An atypical wetland is defined as a wetland whose

July 2018 Modified Habitat Score Ranges

design does not match the type of wetland that would be found in the geomorphic setting of the proposed site (i.e., the water source(s) and hydroperiod proposed for the mitigation site are not typical for the geomorphic setting). In addition, any designs that provide exaggerated morphology or require a berm or other engineered structures to hold back water would be considered atypical. For example, excavating a permanently inundated pond in an existing seasonally saturated or inundated wetland is one example of an enhancement project that could result in an atypical wetland. Another example would be excavating depressions in an existing wetland on a slope that required the construction of berms to impound water.

On a case-by-case basis, it is possible to use the scores from the Washington State wetland rating system to compare functions between the mitigation wetland and the impacted wetland. This information may also be used to adjust replacement ratios. Scores from the methods for assessing wetland functions (Hruby et al. 1999) provide another option to establish whether the functions lost will be replaced if both the affected wetland and the wetland used for compensation are of the same HGM class and subclass.

Mitigation ratios for projects in western Washington are shown in Table 8C-11. Refer to the text box on the basic assumptions on the previous page before reading the table. As mentioned previously, these ratios were developed to provide a starting point for further discussions with each proponent of compensatory mitigation. They only factor in the observations of mitigation success and risk at a programmatic level, and do not represent the specific risk or opportunity of any individual project.

July 2018 Modified Habitat Score Ranges

Table 8C-11. Mitigation ratios for projects in western Washington.

Category and Type of Wetland Impacts	Re-establishment or Creation	Rehabilitation Only ⁴	Re-establishment or Creation (R/C) and Rehabilitation (RH) ⁴	Re-establishment or Creation (R/C) and Enhancement (E) ⁴	Enhancement Only ⁴
All Category IV	1.5:1	3:1	1:1 R/C and 1:1RH	1:1 R/C and 2:1 E	6:1
All Category III	2:1	4:1	1:1 R/C and 2:1 RH	1:1 R/C and 4:1 E	8:1
Category II Estuarine	Case-by-case	4:1 Rehabilitation of an estuarine	Case-by-case	Case-by-case	Case-by-case
Category II Interdunal	2:1 Compensation has to be interdunal wetland	4:1 Compensation has to be interdunal wetland	1:1 R/C and 2:1 RH Compensation has to be interdunal wetland	Not considered an option ⁵	Not considered an option ⁵
All other Category II	3:1	6:1	1:1 R/C and 4:1 RH	1:1 R/C and 8:1 E	12:1
Category I Forested	6:1	12:1	1:1 R/C and 10:1 RH	1:1 R/C and 20:1 E	24:1
Category I based on score for functions	4:1	8:1	1:1 R/C and 6:1 RH	1:1 R/C and 12:1 E	16:1
Category I Natural Heritage site	Not considered possible ⁶	6:1 Rehabilitation of a Natural Heritage site	R/C Not considered possible ⁶	R/C Not considered possible ⁶	Case-by-case
Category I Coastal Lagoon	Not considered possible ⁶	6:1 Rehabilitation of a coastal lagoon	R/C not considered possible ⁶	R/C not considered possible ⁶	Case-by-case
Category I Bog	Not considered possible ⁶	6:1 Rehabilitation of a bog	R/C Not considered possible ⁶	R/C Not considered possible ⁶	Case-by-case
Category I Estuarine	Case-by-case	6:1 Rehabilitation of an estuarine	Case-by-case	Case-by-case	Case-by-case
NOTE: Preservation is discussed in the following section.					

⁴ These ratios are based on the assumption that the rehabilitation or enhancement actions implemented represent the average degree of improvement possible for the site. Proposals to implement more effective rehabilitation or enhancement actions may result in a lower ratio, while less effective actions may result in a higher ratio. The distinction between rehabilitation and enhancement is not clear-cut. Instead, rehabilitation and enhancement actions span a continuum. Proposals that fall within the gray area between rehabilitation and enhancement will result in a ratio that lies between the ratios for rehabilitation and the ratios for enhancement.

⁵ Due to the dynamic nature of interdunal systems, enhancement is not considered an ecologically appropriate action.

⁶ Natural Heritage sites, coastal lagoons, and bogs are considered irreplaceable wetlands because they perform some special functions that cannot be replaced through compensatory mitigation. Impacts to such wetlands would therefore result in a net loss of some functions no matter what kind of compensation is proposed.

8C.3.2 Conditions for Increasing or Reducing Replacement Ratios

Increases in replacement ratios are appropriate under the following circumstances:

- Success of the proposed restoration or creation is uncertain
- A long time will elapse between impact and establishment of wetland functions at the mitigation site
- Proposed mitigation will result in a lower category wetland or reduced functions relative to the wetland being impacted
- The impact was unauthorized

Reductions in replacement ratios are appropriate under the following circumstances:

- Documentation by a qualified wetland specialist (see Appendix 8-H) demonstrates that the proposed mitigation actions have a very high likelihood of success based on prior experience
- Documentation by a qualified wetland specialist demonstrates that the proposed actions for compensation will provide functions and values that are significantly greater than the wetland being affected
- The proposed actions for compensation are conducted in advance of the impact and are shown to be successful
- In wetlands where several HGM classes are found within one delineated boundary, the areas of the wetlands within each HGM class can be scored and rated separately and the ratios adjusted accordingly, if **all of the following** apply:
 - The wetland does not meet any of the criteria for wetlands with “Special Characteristics” as defined in the rating system
 - The rating and score for the entire wetland is provided along with the scores and ratings for each area with a different HGM class.
 - Impacts to the wetland are all within an area that has a different HGM class from the one used to establish the initial category
 - The proponents provide adequate hydrologic and geomorphic data to establish that the boundary between HGM classes lies at least 50 feet outside of the footprint of the impacts

8C.3.3 Replacement Ratios for Preservation

In some cases, preservation of existing wetlands may be acceptable as compensation for wetland losses. Acceptable sites for preservation include those that:

- Are important due to their landscape position
- Are rare or limited wetland types
- Provide high levels of functions

Ratios for preservation in combination with other forms of mitigation generally range from 10:1 to 20:1, as determined on a case-by-case basis, depending on the quality of the wetlands being impacted and the quality of the wetlands being preserved. Ratios for preservation as the sole means of mitigation generally start at 20:1. Specific ratios will depend upon the significance of the preservation project and the quality of the wetland resources lost.

See Chapter 8 (Section 8.3.7.2) and Appendix 8-B for more information on preservation and the criteria for its use as compensation.

8C.3.4 Replacement Ratios for Temporal Impacts and Conversions

When impacts to wetlands are not permanent, local governments often require some compensation for the temporal loss of wetland functions. *Temporal impacts* refer to impacts to those functions that will eventually be replaced but cannot achieve similar functionality in a short time. For example, clearing forested wetland vegetation for pipeline construction could result in the temporal loss of functions, such as song bird habitat provided by the tree canopy. It may take over 20 years to re-establish the level of function lost as a result of clearing the trees. Although the wetlands will be re-vegetated and over time it is anticipated that their previous level of functioning will be re-established, a temporal loss of functions will occur. There is also some risk of failure associated with the impacts or alterations, especially when soil is compacted by equipment, deep excavation is required, and pipeline trenches alter the water regime at the site.

Therefore, in addition to restoring the affected wetland to its previous condition, local governments should consider requiring compensation to account for the risk and temporal loss of wetland functions. Generally, the ratios for temporal impacts to forested and scrub-shrub wetlands are one-quarter of the recommended ratios for permanent impacts (refer to Table 8C-11), provided that the following measures are satisfied:

- An explanation of how hydric soil, especially deep organic soil, is stored and handled in the areas where the soil profile will be severely disturbed for a fairly significant depth or time

July 2018 Modified Habitat Score Ranges

- Surface and groundwater flow patterns are maintained or can be restored immediately following construction
- A 10-year monitoring and maintenance plan is developed and implemented for the restored forest and scrub-shrub wetlands
- Disturbed buffers are re-vegetated and monitored
- Where appropriate, the hydroseed mix to be applied on re-establishment areas is identified

When impacts are to a native emergent community and there is a potential risk that its re-establishment will be unsuccessful, compensation for temporal loss and the potential risk should be required in addition to restoring the affected wetland and monitoring the site. If the impacts are to wetlands dominated by non-native vegetation (e.g., blackberry, reed canarygrass, or pasture grasses), restoration of the affected wetland with native species and monitoring after construction is generally all that is required.

Loss of functions due to the permanent conversion of wetlands from one type to another also requires compensation. When wetlands are not completely lost but are converted to another type, such as a forested wetland converted to an emergent or shrub wetland (e.g., for a utility right-of-way), some functions are lost or reduced.

The ratios for conversion of wetlands from one type to another will vary based on the degree of the alteration, but they are generally one-half of the recommended ratios for permanent impacts (refer to Table 8C-11).

Refer to Appendix 8-F for the rationale for the ratios provided in this appendix.

Specific guidance has been developed for conversions of wetlands to cranberry bogs. Please refer to the 1998 *Guidelines for Implementation of Compensatory Mitigation Requirements for Conversion of Wetlands to Cranberry Bogs* for information on ratios associated with this activity (Washington State Department of Ecology, U.S. Environmental Protection Agency Region 10, U.S. Army Corps of Engineers Seattle District, and U.S. Fish and Wildlife Service. 1998. Special Public Notice: <http://www.nws.usace.army.mil/publicmenu/DOCUMENTS/ACF101C.pdf>).

Appendix E. Mitigation Ratio Tables

Compensation ratios for permanent impacts (western and eastern Washington)

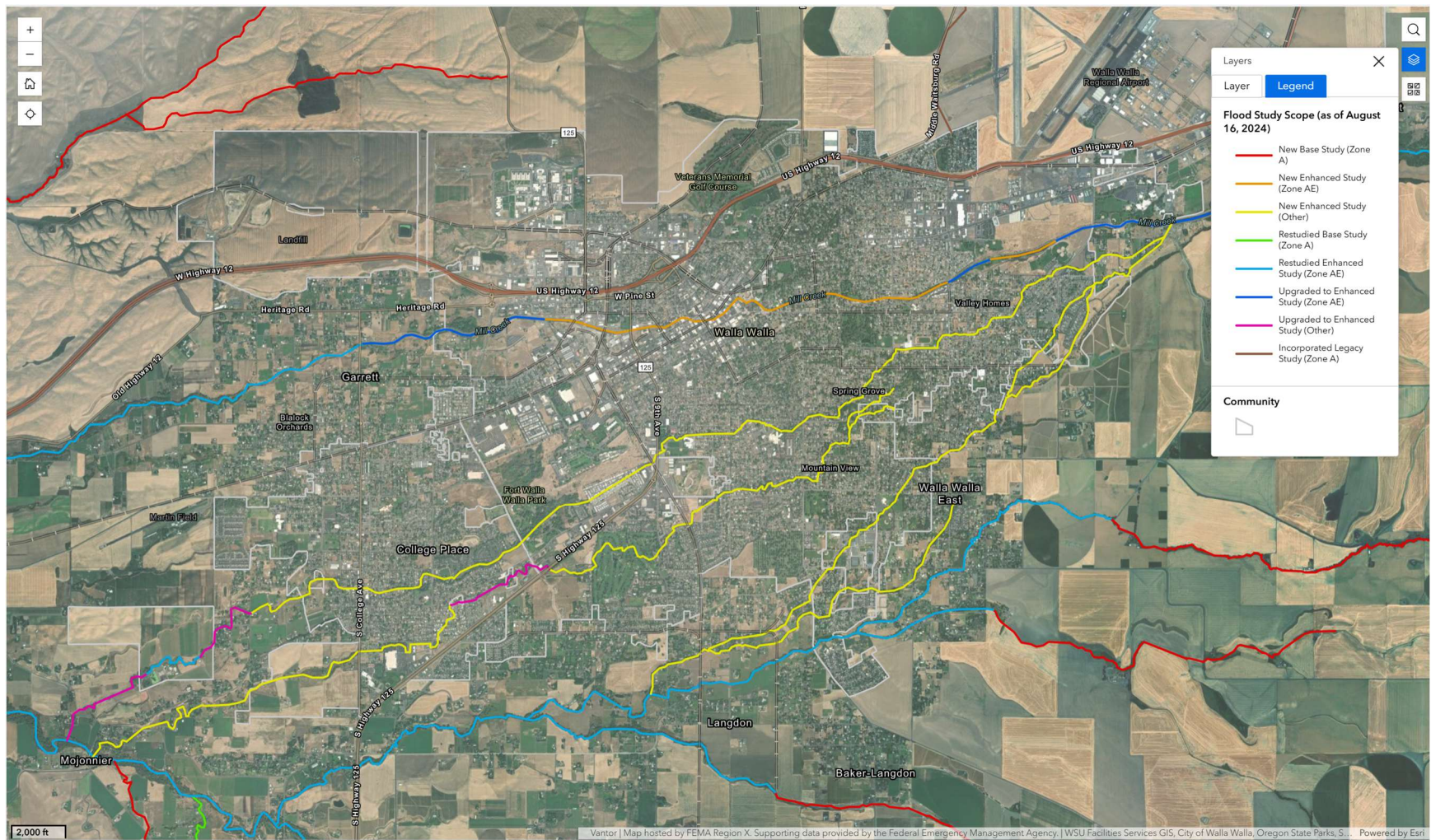
Table 1

Category of impacted wetland (based on score for function)	Re-establishment or creation	Rehabilitation	Preservation	Enhancement
Category I	4:1	8:1	16:1	16:1
Category II	3:1	6:1	12:1	12:1
Category III	2:1	4:1	8:1	8:1
Category IV	1.5:1	3:1	6:1	6:1

Notes:

- Ratios for rehabilitation, preservation, and enhancement may be reduced when combined with 1:1 replacement through re-establishment or creation. See Table 6B-2 in *Wetland Mitigation in Washington State – Part 1: Agency Policies and Guidance –Version 2* (Ecology et al., 2021 or as revised).
- All proposed preservation sites need to meet the preservation criteria listed in Chapter 070.3.E of Appendix A, Sample Wetland Regulations.
- The ratios provide in Table 1 are for permanent, direct impacts to wetlands. For recommended ratios for other types of impacts (e.g., long-term temporary, conversions), see Chapters 6B4.4 through 6B4.8 of *Wetland Mitigation in Washington State – Part 1: Agency Policies and Guidance –Version 2* (Ecology et al., 2021 or as revised).
- The category of impacted wetland is based on scores for functions. Compensation ratios in this table generally do not apply when impacts involve a wetland whose category is based on special characteristics. Compensation ratios for impacts to wetlands with special characteristics are provided in Table 2 below. Specific tables are provided for western and eastern Washington.

APPENDIX C. FEMA Flood Study Update Maps (2026)



FEMA Risk Map [[Scope \(Flood\)](#) | Walla Walla County, Washington - Risk MAP Portfolio]



Federal Emergency Management Agency

Washington, D.C. 20472

JUL 21 2006

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

The Honorable David G. Carey
Chairman, Walla Walla County
Board of Commissioners
P.O. Box 1506
Walla Walla, WA 99362

IN REPLY REFER TO:

Case No.: 05-10-0491P
Community Name: Walla Walla County, WA
Community No.: 530194
Effective Date of **NOV 23 2006**
This Revision:

Dear Mr. Carey:

The Flood Insurance Study report and Flood Insurance Rate Map for your community have been revised by this Letter of Map Revision (LOMR). Please use the enclosed annotated map panel(s) revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals issued in your community.

Additional documents are enclosed which provide information regarding this LOMR. Please see the List of Enclosures below to determine which documents are included. Other attachments specific to this request may be included as referenced in the Determination Document. If you have any questions regarding floodplain management regulations for your community or the National Flood Insurance Program (NFIP) in general, please contact the Consultation Coordination Officer for your community. If you have any technical questions regarding this LOMR, please contact the Director, Federal Insurance and Mitigation Division of the Department of Homeland Security's Federal Emergency Management Agency (FEMA) in Bothell, Washington, at (425) 487-4682, or the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP). Additional information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

Sincerely,

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

For: Doug Bellomo, P.E., Acting Chief
Engineering Management Section
Mitigation Division

List of Enclosures:

Letter of Map Revision Determination Document
Annotated Flood Insurance Rate Map
Annotated Flood Insurance Study Report

cc: Ms. Connie Krueger
Planning Director
County Planning Office
Walla Walla County

Senior Civil/Environmental Engineer
USKH, Inc.



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT

COMMUNITY AND REVISION INFORMATION		PROJECT DESCRIPTION	BASIS OF REQUEST
COMMUNITY	Walla Walla County Washington (Unincorporated Areas)	NO PROJECT	FLOODWAY HYDRAULIC ANALYSIS NEW TOPOGRAPHIC DATA
	COMMUNITY NO.: 530194		
IDENTIFIER	Triple Creek Meadows	APPROXIMATE LATITUDE & LONGITUDE: 46.038, -118.317 SOURCE: USGS QUADRANGLE DATUM: NAD 83	
ANNOTATED MAPPING ENCLOSURES		ANNOTATED STUDY ENCLOSURES	
TYPE: FIRM* NO.: 530194 0445 B DATE: December 1, 1983 TYPE: FBFM** NO.: 530194 0445 DATE: December 1, 1983		DATE OF EFFECTIVE FLOOD INSURANCE STUDY: January 18, 2002 PROFILES: 56P and 61P FLOODWAY DATA TABLE: 3	

Enclosures reflect changes to flooding sources affected by this revision.

* FIRM - Flood Insurance Rate Map; ** FBFM - Flood Boundary and Floodway Map; *** FHBM - Flood Hazard Boundary Map

FLOODING SOURCE(S) & REVISED REACH(ES)

See Page 2 for Additional Flooding Sources

Reser Creek – from the confluence with Russell Creek to approximately 650 feet upstream

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Reser Creek	Zone A2	Zone A2	YES	YES
	Zone B	Zone B	YES	YES
	Floodway	Floodway	YES	YES
	BFEs*	BFEs	NONE	YES

* BFEs - Base Flood Elevations

DETERMINATION

This document provides the determination from the Department of Homeland Security's Federal Emergency Management Agency (FEMA) regarding a request for a Letter of Map Revision (LOMR) for the area described above. Using the information submitted, we have determined that a revision to the flood hazards depicted in the Flood Insurance Study (FIS) report and/or National Flood Insurance Program (NFIP) map is warranted. This document revises the effective NFIP map, as indicated in the attached documentation. Please use the enclosed annotated map panels revised by this LOMR for floodplain management purposes and for all flood insurance policies and renewals in your community.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division

106979 10.3.1.05100491 102-I-A-C



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION (CONTINUED)

OTHER FLOODING SOURCES AFFECTED BY THIS REVISION

FLOODING SOURCE(S) & REVISED REACH(ES)

Russell Creek -- from approximately 100 feet downstream to approximately 2,460 feet upstream of Powerline Road

SUMMARY OF REVISIONS

Flooding Source	Effective Flooding	Revised Flooding	Increases	Decreases
Russell Creek	Zone A5	Zone A5	YES	YES
	Zone B	Zone B	YES	YES
	Floodway	Floodway	YES	YES
	BFEs*	BFEs	YES	YES

* BFEs - Base Flood Elevations

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

COMMUNITY INFORMATION

APPLICABLE NFIP REGULATIONS/COMMUNITY OBLIGATION

We have made this determination pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (P.L. 93-234) and in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, P.L. 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65. Pursuant to Section 1361 of the National Flood Insurance Act of 1968, as amended, communities participating in the NFIP are required to adopt and enforce floodplain management regulations that meet or exceed NFIP criteria. These criteria, including adoption of the FIS report and FIRM, and the modifications made by this LOMR, are the minimum requirements for continued NFIP participation and do not supersede more stringent State/Commonwealth or local requirements to which the regulations apply.

We provide the floodway designation to your community as a tool to regulate floodplain development. Therefore, the floodway revision we have described in this letter, while acceptable to us, must also be acceptable to your community and adopted by appropriate community action, as specified in Paragraph 60.3(d) of the NFIP regulations.

COMMUNITY REMINDERS

We based this determination on the 1-percent-annual-chance flood discharges computed in the FIS for your community without considering subsequent changes in watershed characteristics that could increase flood discharges. Future development of projects upstream could cause increased flood discharges, which could cause increased flood hazards. A comprehensive restudy of your community's flood hazards would consider the cumulative effects of development on flood discharges subsequent to the publication of the FIS report for your community and could, therefore, establish greater flood hazards in this area.

Your community must regulate all proposed floodplain development and ensure that permits required by Federal and/or State/Commonwealth law have been obtained. State/Commonwealth or community officials, based on knowledge of local conditions and in the interest of safety, may set higher standards for construction or may limit development in floodplain areas. If your State/Commonwealth or community has adopted more restrictive or comprehensive floodplain management criteria, those criteria take precedence over the minimum NFIP requirements.

We will not print and distribute this LOMR to primary users, such as local insurance agents or mortgage lenders; instead, the community will serve as a repository for the new data. We encourage you to disseminate the information in this LOMR by preparing a news release for publication in your community's newspaper that describes the revision and explains how your community will provide the data and help interpret the NFIP maps. In that way, interested persons, such as property owners, insurance agents, and mortgage lenders, can benefit from the information.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

A handwritten signature in cursive script that reads "Kevin C. Long".

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

We have designated a Consultation Coordination Officer (CCO) to assist your community. The CCO will be the primary liaison between your community and FEMA. For information regarding your CCO, please contact:

Mr. Carl L. Cook, Jr.
Director, Federal Insurance and Mitigation Division
Federal Emergency Management Agency, Region X
Federal Regional Center
130 228th Street Southwest
Bothell, WA 98021-9796
(425) 487-4682

STATUS OF THE COMMUNITY NFIP MAPS

We will not physically revise and republish the FIRM and FIS report for your community to reflect the modifications made by this LOMR at this time. When changes to the previously cited FIRM panel(s) and FIS report warrant physical revision and republication in the future, we will incorporate the modifications made by this LOMR at that time.

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

A handwritten signature in cursive script that reads "Kevin C. Long".

Kevin C. Long, CFM, Project Engineer
Engineering Management Section
Mitigation Division



Federal Emergency Management Agency

Washington, D.C. 20472

LETTER OF MAP REVISION DETERMINATION DOCUMENT (CONTINUED)

PUBLIC NOTIFICATION OF REVISION

PUBLIC NOTIFICATION

FLOODING SOURCE	LOCATION OF REFERENCED ELEVATION	BFE (FEET NGVD)		MAP PANEL NUMBER(S)
		EFFECTIVE	REVISED	
Reser Creek	Just upstream of confluence with Russell Creek	938	937	0445 B
	Approximately 400 feet upstream of confluence with Russell Creek	941	940	0445 B
Russell Creek	Just upstream of Powerline Road	927	928	0445 B
	Approximately 2,600 feet upstream of Powerline Road	941	940	0445 B

Within 90 days of the second publication in the local newspaper, a citizen may request that we reconsider this determination. Any request for reconsideration must be based on scientific or technical data. Therefore, this letter will be effective only after the 90-day appeal period has elapsed and we have resolved any appeals that we receive during this appeal period. Until this LOMR is effective, the revised BFEs presented in this LOMR may be changed.

A notice of changes will be published in the *Federal Register*. This information also will be published in your local newspaper on or about the dates listed below.

LOCAL NEWSPAPER Name: *Waitsburg Times*
 Dates: 08/17/2006 08/24/2006

This determination is based on the flood data presently available. The enclosed documents provide additional information regarding this determination. If you have any questions about this document, please contact the FEMA Map Assistance Center toll free at 1-877-336-2627 (1-877-FEMA MAP) or by letter addressed to the LOMR Depot, 3601 Eisenhower Avenue, Alexandria, VA 22304. Additional Information about the NFIP is available on our website at <http://www.fema.gov/nfip>.

Kevin C. Long, CFM, Project Engineer
 Engineering Management Section
 Mitigation Division

CHANGES ARE MADE IN DETERMINATIONS OF BASE FLOOD ELEVATIONS FOR THE UNINCORPORATED AREAS OF WALLA WALLA COUNTY, WASHINGTON, UNDER THE NATIONAL FLOOD INSURANCE PROGRAM

On December 1, 1983, the Department of Homeland Security's Federal Emergency Management Agency identified Special Flood Hazard Areas (SFHAs) in the unincorporated areas of Walla Walla County, Washington, through issuance of a Flood Insurance Rate Map (FIRM). The Mitigation Division has determined that modification of the elevations of the flood having a 1-percent chance of being equaled or exceeded in any given year (base flood) for certain locations in this community is appropriate. The modified Base Flood Elevations (BFEs) revise the FIRM for the community.

The changes are being made pursuant to Section 206 of the Flood Disaster Protection Act of 1973 (Public Law 93-234) and are in accordance with the National Flood Insurance Act of 1968, as amended (Title XIII of the Housing and Urban Development Act of 1968, Public Law 90-448), 42 U.S.C. 4001-4128, and 44 CFR Part 65.

A hydraulic analysis was performed to incorporate improved topographic data along Reser and Russell Creeks and has resulted in a revised delineation of the regulatory floodways and increases and decreases in SFHA width for both Reser and Russell Creeks, increased and decreased BFEs for Russell Creek, and decreased BFEs for Reser Creek. The table below indicates existing and modified BFEs for selected locations along the affected lengths of the flooding source(s) cited above.

Location	Existing BFE (feet)*	Modified BFE (feet)*
Reser Creek:		
Just upstream of confluence with Russell Creek	938	937
Approximately 400 feet upstream of confluence with Russell Creek	941	940
Russell Creek:		
Just upstream of Powerline Road	927	928
Approximately 2,100 feet upstream of Powerline Road	941	940

*National Geodetic Vertical Datum, rounded to nearest whole foot

Under the above-mentioned Acts of 1968 and 1973, the Mitigation Division must develop criteria for floodplain management. To participate in the National Flood Insurance Program (NFIP), the community must use the modified BFEs to administer the floodplain management measures of the NFIP. These modified BFEs will also be used to calculate the appropriate flood insurance premium rates for new buildings and their contents and for the second layer of insurance on existing buildings and contents.

Upon the second publication of notice of these changes in this newspaper, any person has 90 days in which he or she can request, through the Chief Executive Officer of the community, that the Mitigation Division reconsider the determination. Any request for reconsideration must be based on knowledge of changed conditions or new scientific or technical data. All interested parties are on notice that until the 90-day period elapses, the Mitigation Division's determination to modify the BFEs may itself be changed.

Any person having knowledge or wishing to comment on these changes should immediately notify:

The Honorable David G. Carey
Chairman, Walla Walla County
Board of Commissioners
P.O. Box 1506
Walla Walla, WA 99362

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION		
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY INCREASE
Reser Creek	637	250	477	3.2	942.6	942.6	943.3 0.7
A	1,145	150	264	5.3	947.7	947.7	948.1 0.4
B	1,375	200	285	5.3	952.6	952.6	953.0 0.4
C	1,845	254	285	5.3	957.3	957.3	957.3 0.0
D	2,115	450	396	3.8	961.7	961.7	961.7 0.0
E	2,315	200	350	4.3	962.4	962.4	962.4 0.0
F	2,945	200	243	6.2	966.9	966.9	967.3 0.4
G	3,760	310	459	3.3	976.0	976.0	976.0 0.0
H	4,610	125	240	6.3	982.6	982.6	982.7 0.1
I	5,445	73	176	8.6	998.1	998.1	998.2 0.1
J							

REVISED
REFLECTIVE

¹ Feet Above Mouth

EFFECTIVE NOV 23 2006

TABLE 3

FEDERAL EMERGENCY MANAGEMENT AGENCY

WALLA WALLA COUNTY, WA
(UNINCORPORATED AREAS)

FLOODWAY DATA

RESER CREEK

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER SURFACE ELEVATION			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY (FEET NGVD)	WITH FLOODWAY	INCREASE
Russell Creek								
A	200	250	477	5.0	862.3	862.3	862.5	0.2
B	880	500	1,436	1.7	872.0	872.0	872.1	0.1
C	1,920	70	205	11.7	878.6	878.6	878.6	0.0
D	2,200	210	398	6.0	882.7	882.7	882.7	0.0
E	3,200	150	346	6.9	889.9	889.9	890.1	0.2
F	3,295	600	860	2.8	893.2	893.2	893.2	0.0
G	4,505	661	465	5.2	903.9	903.9	904.0	0.1
H	5,150	240	414	5.8	912.1	912.1	912.5	0.4
I	5,280	550	633	3.8	915.4	915.4	915.5	0.1
J	6,665	241	343	7.0	924.6	924.6	924.6	0.0
K	7,037	542	2,239	1.1	928.2	928.2	929.1	0.9
L	8,135	154	346	6.9	934.1	934.1	934.2	0.1
M	9,227	240	259	7.4	942.6 ²	942.2	942.2	0.0
N	11,245	46	139	13.8	961.6	961.6	961.6	0.0
O	12,350	50	239	8.0	974.2	974.2	974.2	0.0
P	13,240	35	151	12.7	980.8	980.8	980.8	0.0
Q	14,535	25	92	11.1	990.7	990.7	990.7	0.0
R	15,815	31	162	6.3	1,001.2	1,001.2	1,001.2	0.0
S	15,975	76	434	2.4	1,003.9	1,003.9	1,003.9	0.0
T	16,870	31	99	10.3	1,008.2	1,008.2	1,008.2	0.0
U	17,585	33	125	8.2	1,017.7	1,017.7	1,017.7	0.0
V	17,720	231	713	2.7	1,032.4	1,032.4	1,032.4	0.0
W	18,830	26	143	13.4	1,042.6	1,042.6	1,042.6	0.0
X	19,890	570	471	4.1	1,053.9	1,053.9	1,054.8	0.9
Y	20,960	781	225	8.5	1,063.3	1,063.3	1,063.3	0.0

REVISED
DATA

¹Feet Above Mouth
²Controlled by Reser Creek

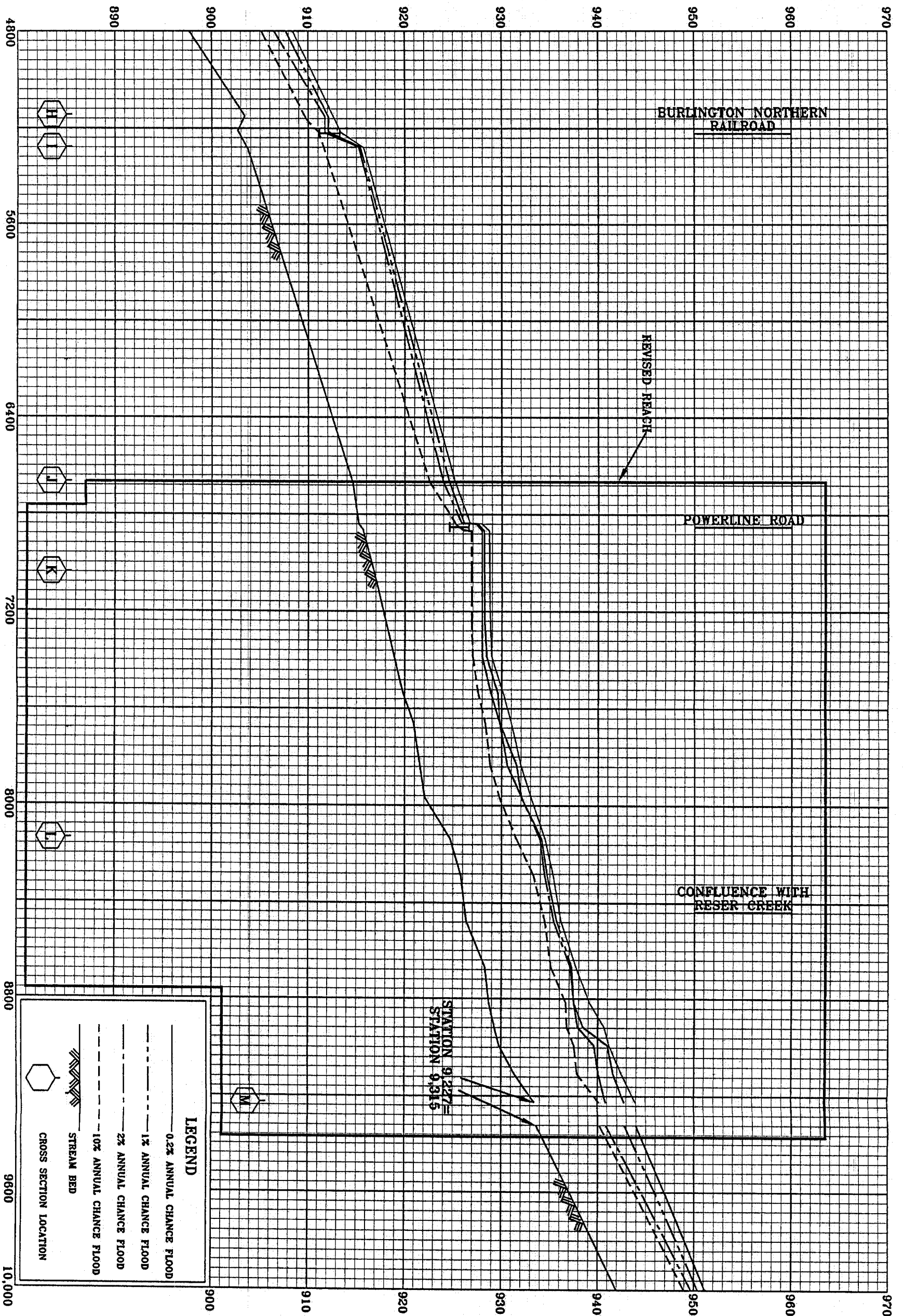
REFLECT LOW
EFFECTIVE NOV 23 2006

FLOODWAY DATA	
FEDERAL EMERGENCY MANAGEMENT AGENCY	WALLA WALLA COUNTY, WA (UNINCORPORATED AREAS)
RUSSELL CREEK	

TABLE 3

ELEVATION IN FEET (NGVD 29)

STREAM DISTANCE IN FEET ABOVE MOUTH



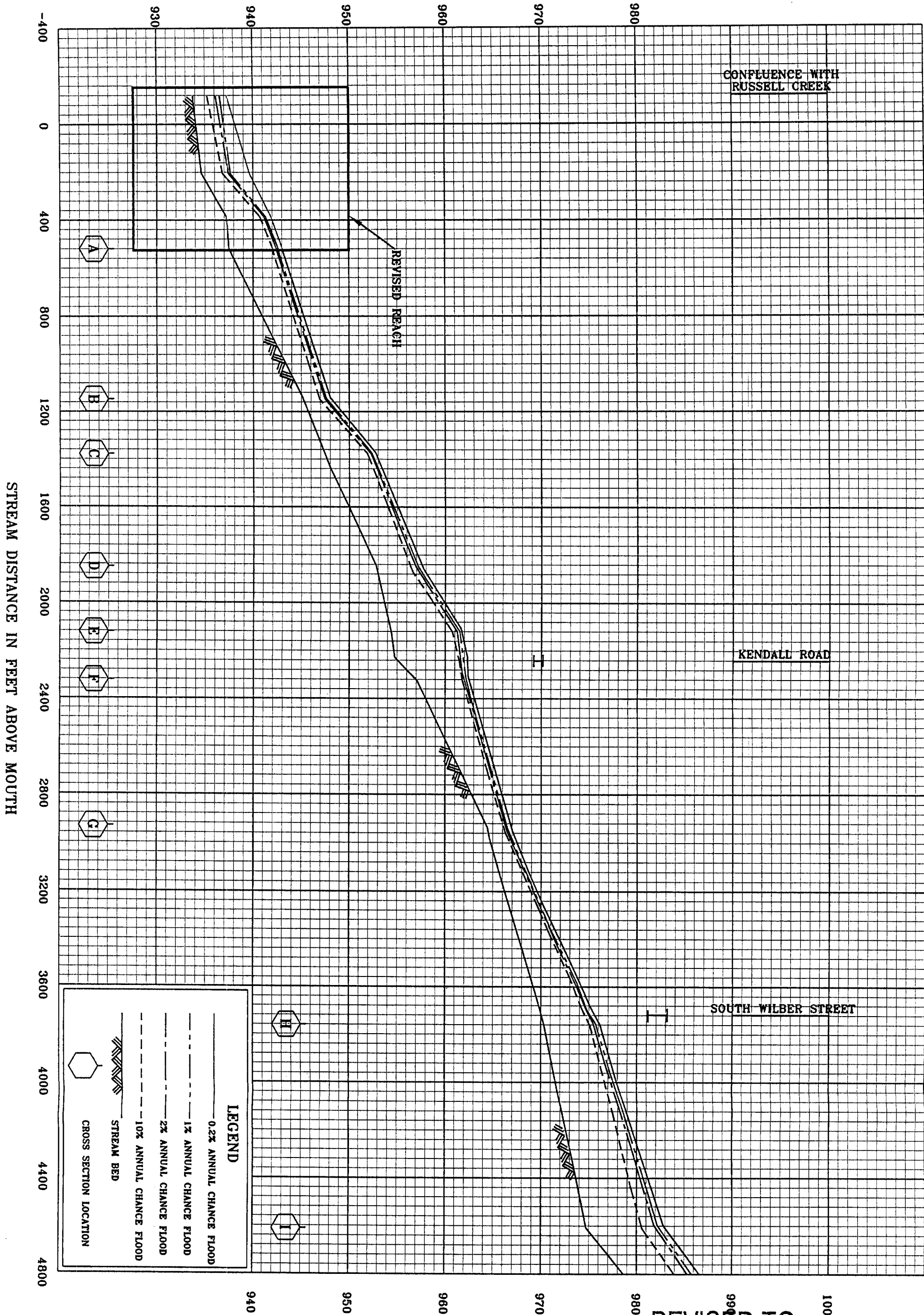
FEDERAL EMERGENCY MANAGEMENT AGENCY
WALLA WALLA COUNTY, WA
(UNINCORPORATED AREAS)

FLOOD PROFILES

RUSSELL CREEK

REVISED TO
REFLECT LOMR
EFFECTIVE NOV 23 2006

ELEVATION IN FEET (NGVD 29)

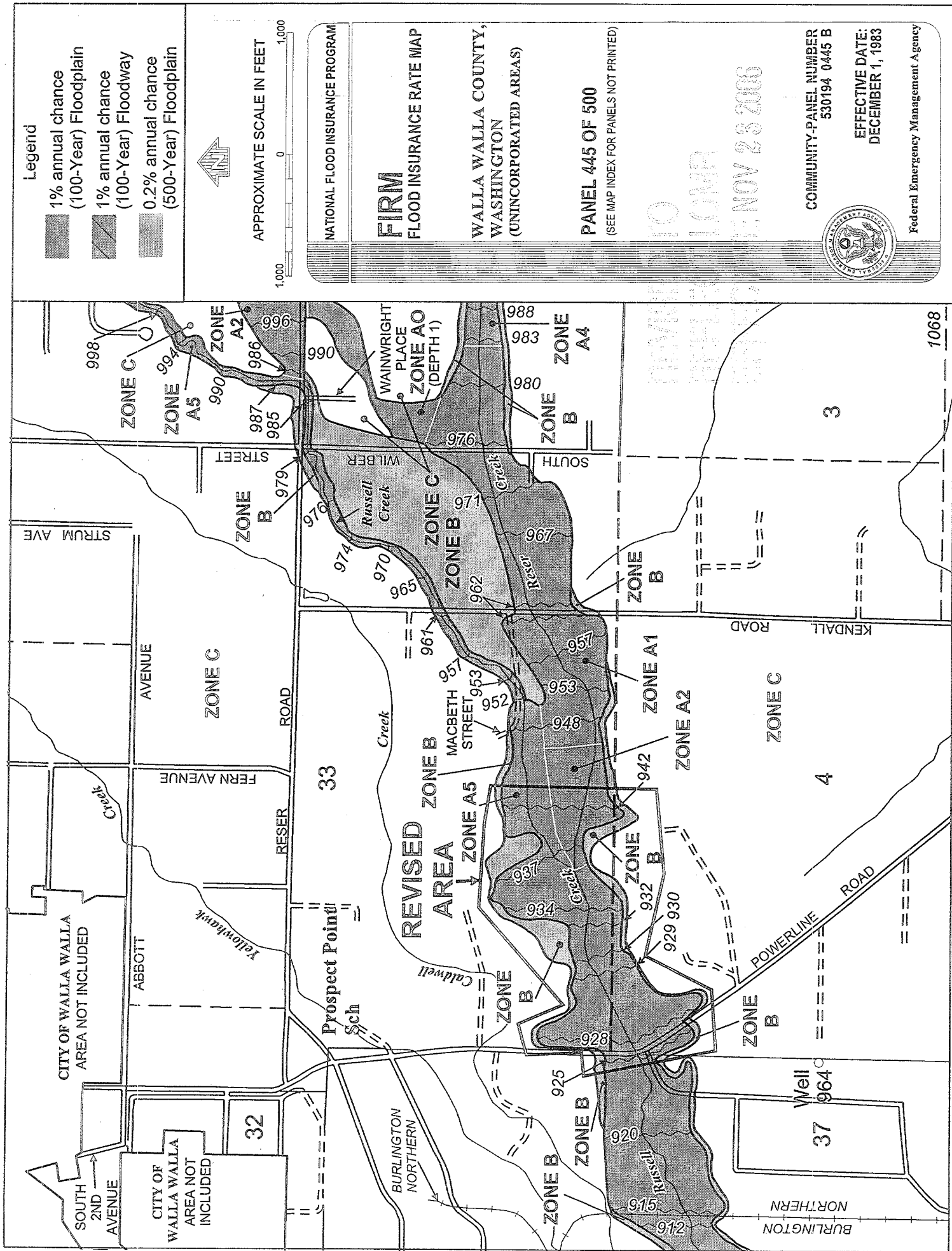


FEDERAL EMERGENCY MANAGEMENT AGENCY

WALLA WALLA COUNTY, WA
(UNINCORPORATED AREAS)

REVISED TO
FLOOD PROFILES
REFLECT LOMR

EFFECTIVE NOV 23 2006



Legend

-  1% annual chance
(100-Year) Floodplain
-  1% annual chance
(100-Year) Floodway
-  0.2% annual chance
(500-Year) Floodplain



APPROXIMATE SCALE IN FEET



NATIONAL FLOOD INSURANCE PROGRAM

**FLOODWAY
FLOOD BOUNDARY AND
FLOODWAY MAP**

WALLA WALLA COUNTY,
WASHINGTON
(UNINCORPORATED AREAS)

PANEL 445 OF 500

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
530194 0445

EFFECTIVE DATE:
DECEMBER 1, 1983



Federal Emergency Management Agency

