

CITY OF MORTON

SMP APPENDIX 2 - CRITICAL AREAS ORDINANCE

Sections 17.32.030 - 17.32.055.4 , City of Morton Zoning and Development Regulations

Section 17.32.030 Critical Area, CR, district

A. Purpose and Intent: The Critical Area special district overlays critical areas defined pursuant to the Washington State Growth Management Act, RCW 36.70A. The purpose of this section is to provide for reasonable protection of the natural environment and public health, safety and welfare, to implement the City of Morton Comprehensive Plan, and to comply with mandated federal and state requirements for critical area protection. This section incorporates best available science as defined by WAC 365-195-905 in determining appropriate measures to protect the functions and values of critical areas and the preservation of anadromous fisheries. Sections 17.32.030-17.32.055 shall be known as the City of Morton Critical Areas Ordinance.

17.32.030.1 CR District- Applicability: All areas within the City and the Morton Urban Growth Area (UGA) meeting the definition of one or more of the following critical areas,

regardless of any formal identification, are hereby designated critical areas and are subject to the provisions of this Section:

- A. Wetlands, as designated in section 17.32.035.1;
- B. Fish and wildlife habitat conservation areas, including riparian habitat management areas, as designated in subsection 17.32.040.1;
- C. Frequently flooded areas as designated subsection 17.32.045.1.
- D. Geologically hazardous areas as designated in subsection 17.32.050.1; and
- E. Critical aquifer recharge areas as designated subsection 17.32.055.1.

The City shall process permits and approvals within the Morton UGA in accordance with this section.

17.32.030.1.1 Reference maps and information. Critical areas defined in this Section are displayed in general form on a variety of reference materials. These materials do not depict detailed information about the type, size, and specific location of critical areas, but will be relied on for planning purposes and for regulatory purposes in the absence of more detailed information on a specific site. Reference materials include but are not limited to:

- A. The City of Morton Comprehensive Plan map (critical areas), as amended;
- B. The City of Morton Critical Aquifer Recharge Area map, as amended;
- C. Lewis County Public Works GIS Map Library (includes aerial photos);
- D. FEMA Flood Insurance Rate Maps;
- E. US Fish and Wildlife Service National Wetlands Inventory;
- F. Washington State Department of Fish and Wildlife Priority Habitats and Species Maps;
- G. US Geological Survey topographic maps.

17.32.030.2 Critical area review required- Critical Area Report. The City shall not grant any permit or approval required by this Title or under the building code or subdivision regulations to alter the condition of land, water, or vegetation on a parcel or

project site that includes an identified critical area or critical area buffer, or is likely to affect an identified critical area within 300 feet of the boundary of the project site according to best available science, prior to fulfilling the requirements of this section, unless the activity is specifically exempted in subsection 17.32.030.5. Such permits or approvals include, but are not limited to: building permits, conditional use permits, shoreline permits required under the Lewis County Shoreline Master Program (SMP), variance, subdivisions and short subdivisions, or rezones. As part of all permit applications, the City shall require a Critical Area Report to be submitted by the applicant, including the following information:

- A. Site description, including a site map of a scale no smaller than 1" = 200', showing existing vegetation, all critical areas, including their type and size, if known, and existing and proposed structures or development areas;
- B. An assessment of whether the proposed use or activity will be built or commenced consistent with this section;
- C. Whether proposed alterations to an identified critical area(s) is necessary for purposes of the proposed use or activity;
- D. What mitigation may be required to offset potential impacts to an identified critical area;
- E. Any additional information required by the specific critical area section, below.

The City may establish fees to cover the costs of ~~review of~~ reviewing projects including critical areas. Critical area review will occur according to the same timeline required for the associated permit review, or 120 days, whichever is shorter.

17.32.030.3 Protection of Critical Areas- Best Available Science- Preservation of critical area functions. Any action taken pursuant to this Section shall result in equivalent or greater functions and values of the critical areas associated with the proposed action, as determined by the best available science. All actions and developments shall be designed and constructed to avoid, minimize, and restore all adverse impacts. Applicants must first demonstrate an inability to avoid or reduce impacts, before restoration and compensation of impacts will be allowed. No activity or use shall be allowed that results in a net loss of the functions or values of critical areas.

17.32.030.4 Relationship to Other Regulations.

- A. This Section shall apply as an overlay and in addition to other regulations in this Title and other regulations adopted by the City.
- B. Where multiple buffers or overlays are present (e.g., if one critical area is adjacent to or concurrent with another critical area), or where other setbacks or regulations provided in this Title occur with critical areas standards, the most restrictive standard shall apply.
- C. These critical areas regulations shall apply concurrently with review conducted under the State Environmental Policy Act (SEPA), as locally adopted. Any conditions required pursuant to this Section shall be included in the SEPA review and threshold determination.
- D. Compliance with the provisions of this Section does not constitute compliance with other federal, state, and local regulations and permit requirements that may be required (for example, Shoreline Substantial Development Permits, Hydraulic Permit Act (HPA) permits, Section 106 of the National Historic Preservation Act, U.S. Army Corps of Engineers Section 404 permits, National Pollution Discharge Elimination System permits). The applicant is responsible for complying with these requirements, apart from the process established in this Section.

17.32.030.5 Exempt activities. The following activities are exempt from review under this section provided that they are otherwise consistent with the provisions of this Title and other local, state, and federal laws and requirements: [References to the Lewis County SMP shall be considered to be to the Morton SMP \(this document\).](#)

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- A. **Emergencies.** Those activities necessary to prevent an immediate threat to public health, safety, or welfare, or that pose an immediate risk of damage to private property and that require remedial or preventative action in a timeframe too short to allow for compliance with the requirements of this Section. Emergency actions must be designed to have the least possible impact to the critical area or its buffer. The State Department of Fish and Wildlife requires a verbal or written Hydraulic Project Approval (HPA) before taking emergency action that could change the natural flow or bed of waters of the state; notice should be given to the 24-hr HPA hotline number, 360-902-2537 prior to taking action. In addition, the person or agency undertaking such action shall notify the City within one (1) working day following commencement of the emergency activity. If the City determines that the action was taken beyond the scope of emergency actions allowed in this subsection, the City will determine what enforcement provisions may be required. After the emergency, the person or agency undertaking the action shall fully fund and conduct necessary restoration and/or mitigation for any impacts to the critical area and buffers resulting from the emergency action. A mitigation plan shall be reviewed by the City, and all mitigation must be completed in a timely manner.

B. **Existing and ongoing activities and related maintenance or repair.** Operation, maintenance, or repair of existing structures, utilities, public or private roadways, railways, dikes, levees, or drainage systems within the existing use area, that does not further encroach upon an identified critical area, and that utilizes best management practices. This does not include widening or upgrading existing roadways or stream crossings.

C. **Passive recreation, education, and research.** Outdoor, passive recreational activities including fishing, birdwatching, hiking, swimming, and paddling, so long as no built infrastructure is required to support the activity, except that:

~~1~~-a. Wildlife watching blinds or viewing structures are permitted in the wetland and riparian area buffers only;

b. Unpaved nature trails or perviously-paved trails and raised boardwalks are permitted in wetland and riparian buffers only, so long as the wetland or riparian area's functions and values will not be adversely impacted by the trail.

~~2~~-c. Within shoreline jurisdiction, pathways and trails in wetland buffers shall be limited to the outer 25% of wetland buffers. Outside of wetland buffers, pathways and trails are allowed within the shoreline buffer to provide access to aquatic features.

D. **Forest Practices.** Forest practices regulated and conducted in accordance with the provisions of Chapter 76.09 RCW and forest practices regulations, Title 222 WAC, and those that are exempt from City's jurisdiction.

E. **New utility corridors and drilling for utilities.** New utility corridors shall be aligned outside of wetland buffers and riparian habitat areas and buffers established for other fish and wildlife habitat conservation areas to the maximum extent possible. Drilling under a wetland or riparian area is allowed provided that the drilling does not interrupt the ground water connection to the wetland or stream or percolation of surface water down through the soil column. A hydrologic study by a qualified hydrologist is necessary to determine whether the ground water connection to the wetland or stream or percolation of surface water down through the soil column is disturbed. Utility transmission lines, cables, sewer and water lines may cross streams using existing crossings where possible. Utility corridors shall be revegetated immediately upon completion of construction, and no pesticides, herbicides, or other hazardous substances may be used in the maintenance of such corridors within a wetland or buffer or fish and wildlife habitat conservation area or buffer.

F. **Existing and ongoing agriculture.** Parcels or portions of parcels that have been in use for existing and ongoing agricultural activities from DATE OF ORDINANCE EFFECTIVENESS September 27, 2016 may continue, subject to best management practices, without requiring additional critical area review under this ordinance. This exemption does not include crop conversions that would alter flood storage

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capacity or conveyance, significant increase in the number of livestock using the critical area, or any activity that would require a new building permit or other permit or approval under this Title.

- G. **Removal of hazard trees.** Removal of dead or dying trees or vegetation that present a windfall hazard posing potential risk to the public or subject property. The City can require a qualified arborist to provide information certifying that the tree proposed for removal is a hazard tree.
- H. **Stormwater retention.** Retention/detention and biofiltration facilities for improving surface water quality to the extent permitted by federal and state law is permitted in the outer 25% of Category III or Category IV wetlands, as defined in this section. Stormwater facilities are not otherwise permitted in Fish and Wildlife Habitat buffers.
- I. **Boundary and survey markers or site investigative work.** Provided that disturbance shall be temporary and minimized and disturbed areas shall be immediately restored.
- J. **Enhancement of a critical area through the removal of non-native invasive species.** Weeding shall be restricted to hand removal and weed material shall be removed from the site. Bare areas that remain after weed removal shall be revegetated with native shrubs and trees at natural densities. Some hand seeding may also be done over the bare areas with native herbs.
- K. **Harvesting of wild crops in wetlands.** Wild crops may be harvested from wetlands in a manner that is not injurious to natural reproduction of such crops and provided the harvesting does not require tilling of soil, planting of crops, chemical applications, or alteration of the wetland by changing existing topography, water conditions, or water sources.
- L. **Fencing.** Fencing may be required in a critical area buffer by the City as part of a proposed activity or as required in Section. Fencing shall be designed so as to not interfere with species migration, including fish runs, and shall be constructed in a manner that minimizes impacts to wildlife habitat and hydrology.
- ~~M.~~ **Replacement of nonconforming structures.** Nonconforming structures may be replaced within 12 months of demolition or destruction to the existing footprint of the previous structure, provided there is no feasible alternative location outside an established critical area or buffer. A property owner may apply for a variance to allow and extension of this time limit, and/or to allow limited expansion of the footprint (no greater than 50%), provided all other building setbacks required by this Title are met.

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~~⁴An amendment to Section 12.021 Nonconforming structures – replacement is also proposed: If an existing nonconforming structure is destroyed by fire or an act of nature, it may be replaced in the footprint of the previous nonconforming use, subject to necessary modifications to provide for public health and safety, within 12 months of the~~

17.32.030.6 Reasonable use exception. If the application of this section would deny all reasonable use of the property, development may be permitted consistent with the protection of public health and safety, and to the minimum disturbance necessary to permit the use. An application for a reasonable use exception must be filed with the City and shall be heard by the Planning Commission with legal advice from the City Attorney. The Planning Commission shall hold a public hearing and make a recommendation to the City Council, who shall issue the final decision. An approved mitigation plan using best available science to minimize and mitigate impacts shall be required as a condition of the reasonable use exception. Within shoreline jurisdiction, shoreline variances will serve as a reasonable use exception or variance review.

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17.032.030.7 Variance. Variance procedures are available in accordance with Section 17.60. Within shoreline jurisdiction, shoreline variances will serve as a reasonable use exception or variance review.

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17.32.030.8 Violations and enforcement. A person or entity who fails to conform to the terms of sections 17.32.030-17.32.055 shall be construed as having violated the City of Morton Zoning and Development Regulations, subject to section 1.110 (Violation-Penalty). The City of Morton may stop work on a project if it finds that the project does not comply with any requirements imposed by sections 17.32.030-17.32.055, or if the applicant or permittee has not complied with any or all of the conditions or limitations set forth in the permit.

Wetlands

~~destruction. If replacement cannot be completed within 12 months, the property owner may apply for a variance to extend this time limit. Older mobile homes and manufactured homes must be replaced by a designated manufactured home with a manufacture date of not more than five years from the date of installation, or may be replaced by a stick-built home in the same footprint as the previous home. A property owner may apply for a variance to allow limited expansion of the footprint (no greater than 50%), provided all other building setbacks required by this Title are met.~~

17.32.035.1 Wetland identification and classification. Known wetlands locations are mapped in the City of Morton Comprehensive Plan, using data provided by the National Wetlands Inventory and Lewis County. However, this map shall be used only as a guide, and wetlands discovered in the course of site investigation for a permit or approval required by this Title are subject to review under this subsection. It is the responsibility of the applicant to provide information from a qualified biologist or wetland specialist as to the location and extent of the wetland, using the Washington State Wetland Identification and Delineation Manual (1997), <http://www.ecy.wa.gov/programs/sea/pubs/96-94.html>.

Wetland identification and classification. In shoreline jurisdiction, identification of wetlands and delineation of their boundaries shall be done in accordance with the approved federal wetland delineation manual and applicable regional supplements, as amended. Wetlands are determined by the 1987 Wetland Delineation Manual by the U.S. Corps of Engineers (USACE) and the 2010 Regional Supplement to USACE Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0). and the For regulatory purposes in Washington, wetland functions and values are typically categorized in a rating system. The most widely accepted rating system, the Washington State Wetland Rating System for Western Washington: 2014 Update, version 2, was developed by the Department of Ecology and is considered to be the regional standard by all regulating agencies. This rating system is a rapid assessment tool that evaluates wetland functions in the categories of water quality, hydrology, and habitat, among a framework of three dimensions of site potential, landscape potential, and societal value. Ecology publication #23-06-009 details current guidelines for wetland classification².

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The Washington State Wetland Rating System was updated in 2014. In shoreline jurisdiction, the following point scale shall be used to separate the wetland categories used in this table:

- Habitat scores of 29-36 points will be 8-9 points;
- Habitat scores of 20-28 points will be 5-7 points; and
- A water quality score of 24-32 points and a habitat score <20 points will be water quality 8-9 points and a habitat score of 3-4 points.
- For category IV wetlands, scores of <30 for all functions will be 9-15 points.

wetland class/category using the Washington State Department of Ecology wetland rating system (Washington State Wetland Rating System for Western Washington, <http://www.ecy.wa.gov/biblio/0406025.html>).

17.32.035.2 Allowed activities within wetlands and wetland buffers. Activities exempted in subsection 17.32.030.5 are allowed in wetlands and their buffers without requirement of a Critical Area Report.

² <https://apps.ecology.wa.gov/publications/documents/2306009.pdf>

17.32.035.3 Density transfer and PUD option. A planned unit development (PUD) in accordance with Section 17.32.050 may be used for subdivision proposals on project sites with wetlands, excluding building of single family homes on existing lots or activities listed under Section 17.32.030. Through a PUD, density may be transferred from the wetland portion of the site to the upland portion of the site, with net density not to exceed that of the underlying zoning district. A wetland delineation by a qualified wetlands biologist will be required as part of the PUD review.

17.32.035.4 Wetland buffers. ~~The following~~ Prescribed wetland buffers are established based on the category of wetland and the impact (intensity) of the proposed land use to occur adjacent to the wetland according to best available science and Appendix 8-C of the July 2018 Modified Habitat Score Ranges (Ecology Publication #14-06-029):

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Low intensity uses include the following activities:

- 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.

Moderate intensity uses include the following activities:

- 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

High intensity uses include the following activities:

- 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

Table 1. Wetland categories and land use intensity

Wetland category: <i>Scoring system uses the Washington State Wetland Rating System for Western Washington</i>	Low Intensity Land Uses: Forestry (not including roads), utility corridor (without associated road), passive recreation not otherwise allowed	Moderate Intensity Land Uses: Residential development with net density of 1 unit/acre or less dense; Active recreation (sport courts, golf courses); New or converted moderate intensity agriculture (orchards, hay fields, other crops not requiring annual tilling); Paved trails or logging roads; Utility corridors with associated access and maintenance roads	High Intensity Land Uses: Commercial, Industrial, or Institutional developments; Residential net densities greater than 1 unit/acre; New or converted high intensity agriculture (dairies, nurseries, greenhouses, annual crop tilling, livestock, poultry and egg production)	Other Recommended Measures³
Category I				
Natural Heritage Wetlands/Wetlands of High Conservation Value	125 feet	190 feet 300 feet for septic systems	250 feet 300 feet for septic systems	No additional surface discharges to wetland or its tributaries No septic systems within 300 ft of wetland Restore degraded parts of buffer

³ Ecology Publication No. 05-06-008 Appendix 8-C Guidance on Widths of Buffers and Ratios for Compensatory Mitigation, June 2014, Page 9
<https://apps.ecology.wa.gov/publications/parts/0506008part1.pdf>

Bogs	125 feet	190 feet	250 feet	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
Category I (8-9 points)				
Habitat score: 29–368-9 points	150 feet	225 feet	300 feet	Maintain connections to other habitat areas Restore degraded parts of buffer
Habitat score: 20-286-7 points	75 feet	110 feet	150 feet	
Water quality score: 24-328-9 points and Habitat score: < 20-6 points	50 feet	75 feet	100 feet	No additional surface discharges of untreated runoff
Not meeting any of the above characteristics	50 feet	75 feet	100 feet	
Category II (20-22 points)				
Habitat score: 29–368-9 points	150 feet	225 feet	300 feet	Maintain connections to other habitat areas)
Habitat score: 20-286-7 points	75 feet	110 feet	150 feet	
Water quality score: 24-328-9 points and Habitat score: < 20-6 points	50 feet	75 feet	100 feet	No additional surface discharges of untreated runoff
Not meeting above characteristics	50 feet	75 feet	100 feet	

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Commented [TC10R9]: Wetland of High Conservation Value (WHCV) : a wetland that supports rare species or a rare or high-quality ecosystem type. Should be considered here and above in exemptions/exclusions.

Commented [TC11R9]: <https://www.dnr.wa.gov/NHPfieldguide> rare plants of WA list

Commented [TC12R9]: <https://www.dnr.wa.gov/NHPwetlands> wetland and riparian vegetation types

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Category III (16-19 points)				
Habitat function score: 20-286-7 points	75 feet	110 feet	150 feet	
Habitat score < 203-5 points	40 feet	60 feet	80 feet	
Category IV (<16 points)				
Score < 1630 points for all functions	25 feet	40 feet	50 feet	

Except as otherwise specified or allowed in accordance with this Title, wetland buffers shall be retained in an undisturbed or enhanced condition. No development activity is permitted within these buffers, except those activities exempted under subsection 17.32.030.5 (Exempt Activities) or as permitted through a [shoreline variance or reasonable use exception](#). Removal of vegetation in these buffers is prohibited, except as part of an approved habitat management plan or mitigation plan or as allowed under this section.

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17.32.035.5 Measurement of Wetland Buffers. All buffers shall be measured from the wetland boundary outward on a horizontal plane as surveyed in the field. The buffer for a wetland created, restored, or enhanced as compensation for approved wetland alterations under section 17.32.035.9 shall be the same as the buffer required for the category of the created, restored, or enhanced wetland. Existing lawns, walkways, driveways, structures and other mowed or paved areas will be deducted from the measurement of buffer width. If a wetland buffer overlaps with another buffer or critical area (e.g., riparian buffer or 100-year flood zone), the wider buffer prevails.

17.32.035.6 Habitat connectivity required.

If a project site includes any portion of a forested wetland or any wetland with a high habitat score (~~29-368-9~~ points in the *Washington State Wetland Rating System for Western Washington*), [impact minimization measures must be implemented under Appendix 2 MMC 17.32.035.4 Table 1 \(Recommended Measures\)](#) the applicant must

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identify and maintain wildlife corridors with habitat areas listed in section 17.32.040 (*Fish and Wildlife Habitat Conservation Areas*) for species known or assumed to occur within the wetland. If this corridor is at least 100 feet wide, is vegetated with native vegetation, and is subject to permanent protection (e.g., is placed in an open space tract or has a conservation easement), then the required wetland buffer may be reduced by 25%.

17.32.035.7 Wetland buffer averaging. The width of a wetland buffer may be reduced in one area and increased proportionally in another area if such averaging will not impair or reduce the functions and values of the wetland, e.g., for erosion control, groundwater recharge, or habitat protection, and provided that the buffer is in no location reduced by more than 25%. However, a wetland buffer may not be reduced in any area to less than 25 feet. Buffer averaging may not be used in conjunction with any other buffer reduction.

17.32.035.8 Special requirements for High Intensity Land Uses.

For High Intensity Land Uses listed in section 17.32.035.4, the following requirements apply, regardless of wetland category:

- A. Outdoor lighting must be shielded or directed away from the wetland;
- B. Noise-generating activities must be located as far from the wetland buffer boundary as practicable;
- C. Pesticide use must be limited, and integrated pest management practices must be used;
- D. New stormwater runoff from lawns and impervious surfaces must be dispersed and infiltrated, not channeled to the wetland buffer (does not apply to stormwater treatment facilities in the buffer as limited by subsection 17.32.030.5);
- E. Fencing of the wetland to prevent pet and human disturbance may be required;
- F. Best management practices must be used for all agricultural activities.

17.32.035.9 Wetland mitigation. Avoidance of wetland impacts is required as a first approach to development near a wetland. If, via a ~~reasonable use exception or shoreline~~ variance, alteration or loss of a wetland function or value does occur, the project proponent must submit a mitigation plan by a qualified wetland biologist to replace the functions and values lost by the wetland. This mitigation plan must include annual project monitoring for a period of 10 years, with reports to the City in years 1, 2, 3, 5, 7, and 10.

Monitoring periods may be reduced if success criteria are met prior to the 10-year term.

Mitigation must include either restoration of the disturbed area, or creation or enhancement of wetland areas to compensate for wetland losses. A mitigation plan that relies on replacement of wetland areas either on site or within the city limits or UGA must justify its mitigation ratios by best available science and apply the following wetland replacement ratios (expressed in terms of acres):

Category I: 6:1
Category II: 3:1
Category III: 2:1
Category IV: 1.5:1

In shoreline jurisdiction, mitigation ratios that rely on enhancement of wetland areas shall be quadrupled rather than doubled. Required mitigation plans shall establish performance standards for evaluating the success of compensatory mitigation actions.

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The above ratios must be doubled for mitigation that relies on enhancement of wetland areas. For example, the ratio for enhancement in a Category II wetland would be 6:1. In addition, the City may require these ratios to be increased if there is uncertainty as to the success of a restoration or creation project. The City may require review of mitigation plans by the Washington State Department of Ecology.

17.32.035.91 Wetland banking. The City of Morton encourages the creation of a public or private wetland mitigation banking system when feasible. An applicant may use a mitigation bank established in accordance with Washington State Department of Ecology rules and upon approval of the City, to meet the requirements of subsection 17.32.035.9.

Fish and Wildlife Habitat Conservation Areas

17.32.040.1 Fish and wildlife habitat conservation areas- mapping. Fish and Wildlife Habitat Conservation Areas are not specifically mapped, except in the case of streams and wetland locations, which are shown in the City of Morton Comprehensive Plan Critical Areas Map. However, this map is intended as a guide only. Applicants must rely on best

available science to provide information on the known locations of fish and wildlife habitat conservation areas and the width of buffers associated with them.

17.32.040.2 Fish and wildlife habitat conservation areas- designation.

The following areas are designated as fish and wildlife habitat conservation areas subject to the requirements of this Section:

A. Areas With Which State or Federally Designated Endangered, Threatened, and Sensitive Species Have a Primary Association:

~~1.a.~~ Site with federally designated endangered and threatened species identified by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service that are in danger of extinction or threatened to become endangered. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service should be consulted for current listing status.

~~2.b.~~ Sites with state designated endangered, threatened, and sensitive species native to the state of Washington identified by the Washington Department of Fish and Wildlife, that are in danger of extinction, threatened to become endangered, vulnerable, or declining and are likely to become endangered or threatened in a significant portion of their range within the state without cooperative management or removal of threats. State designated endangered, threatened, and sensitive species are periodically recorded in WAC 232-12-014 (state endangered species) and WAC 232-12-011 (state threatened and sensitive species). The state Department of Fish and Wildlife maintains the most current listing and should be consulted for current listing status.

B. State Priority Habitats and Areas Associated With State Priority Species as listed on the most current Washington State Department of Fish and Wildlife Priority Habitats and Species (PHS) list. Priority species require protective measures for their perpetuation due to their population status, sensitivity to habitat alteration, and/or recreational, commercial, or tribal importance. Priority habitats are those habitat types or elements with unique or significant value to a diverse assemblage of species. A priority habitat may consist of a unique vegetation type or dominant plant species, a described successional stage, or a specific structural element.

C. Locally important habitats or species. Riparian areas associated with Connolly Creek, Tilton River, and Lake Creek are considered locally important habitats. Additional habitats or species of local importance may be designated by the City after review by the Planning Commission and a public hearing. Individuals may also nominate habitat or species of local importance through a Comprehensive Plan Amendment process. To be considered, nominations must include recommendations for habitat or species protection based on Best Available

Science, including the Washington State Department of Fish and Wildlife PHS management recommendations, if available.

D. **Other fish and wildlife habitat areas.** In addition to the areas described above, the following habitats are subject to the requirements of this section:

~~1-a.~~ Naturally occurring ponds under twenty acres and their associated submerged aquatic beds;

~~2-b.~~ Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity; or

~~3-c.~~ State natural area preserves and natural resource conservation areas.

17.32.040.3 Fish and Wildlife Habitat Conservation Areas- standards for non-exempt activities.

The City shall review all activities proposed to alter or impact a fish and wildlife habitat conservation area, as determined through review of the Critical Area Report required by section 17.32.030.2, except as exempted by subsection 17.32.030.5, and shall condition any approvals supported by the best available science, as follows:

A. **Establishment of Non-Riparian Buffers.** The City shall require the establishment of buffer areas for activities adjacent to habitat conservation areas where necessary to protect habitat conservation areas. Buffers shall consist of an undisturbed area of native vegetation or areas identified for restoration established to protect the integrity, functions, and values of the affected habitat. Required buffer widths shall reflect the sensitivity of the habitat and the type and intensity of human activity proposed to be conducted nearby and shall be consistent with the management recommendations issued by the WDFW. Specific riparian habitat buffers are defined in Section 17.32.040.5, below.

B. **Additional conditions.** Additional conditions for approval may include, but are not limited to, the following:

~~1-a.~~ Preservation of critically important vegetation and/or habitat features such as snags and downed wood;

~~2-b.~~ Limitation of access to the habitat area, including fencing to deter unauthorized access;

~~3-c.~~ Seasonal restriction of construction activities;

~~4-d.~~ Establishment of a duration and timetable for periodic review of mitigation activities; and

~~5-e.~~ Requirement of a performance bond, when necessary, to ensure completion and success of proposed mitigation.

~~C.A.~~ **Standards for specific uses and activities.** Because fish and wildlife habitat conservation areas can cover a large amount of land (e.g., elk wintering grounds),

specific standards for uses and activities not otherwise exempted by subsection 17.32.030.5 are necessary to provide for reasonable development potential on private property. Consultation with WDFW can be required by the City prior to approval of the use or activity. The following standards apply to uses and activities listed below that are proposed for or located in an established fish and wildlife habitat conservation area or buffer associated with such an area:

~~1.~~a. **New construction.** New structures in fish and wildlife habitat conservation areas are permitted, subject to the other requirements in this Section, if the lot was legally created prior to EFFECTIVE DATE OF THIS ORDINANCE, or if the lot has less than 5,000 square feet of buildable area outside the fish and wildlife habitat conservation area or buffer. New construction is not permitted in riparian habitat areas pursuant to Section 17.32.040.6.

~~2.~~ **Onsite sewage systems and wells.** New sewage systems and wells serving an approved use are allowed if there is not suitable area on the property outside the area or established buffers to accommodate the system or well. Replacement of failing onsite sewage disposal systems is permitted, provided that clearing vegetation shall be limited to the maximum extent possible. Maintenance of access trails or roads shall not involve the use of herbicides or other hazardous materials.

~~b.~~

~~3.~~c. **New agricultural activities.** Fencing is required to keep livestock out of riparian habitat areas established pursuant to section 17.32.040.5, below). Manure and hazardous materials storage is prohibited within riparian habitat areas and buffers established by this section for aquatic areas (e.g., ponds). Drainage ditch maintenance and all other activities must follow best management practices in consultation with the local Conservation District or Natural Resources Conservation Service (NRCS) office.

~~4.~~d. **Clearing and grading.** No clearing and grading shall occur within an area where a priority species has a primary association (e.g., nesting, foraging, or roosting area) as identified in the Critical Area Report and per WDFW PHS management recommendations. Nor shall clearing and grading occur within riparian habitat areas pursuant to section 17.32.040.6. Additional requirements on the extent and timing of clearing and grading activities may be required through a habitat management plan (e.g., specifying times of year where activity is limited due to seasonal use of the site for calving or nesting).

~~5.~~e. **Road and railroad safety and maintenance.** Maintenance and safety improvements to existing roads and railroads within rights-of-way is permitted subject to best management practices accepted by the City. Pesticides and other hazardous materials shall not be used where they could

be expected to reach the undeveloped portion of the fish and wildlife habitat conservation area.

6-f. New road and bridge crossings. New road and bridge crossings of riparian habitat areas shall be prohibited except where there is no alternative (e.g., to provide access to existing legal lots where no other access is physically possible). Crossings shall occur where they would have the least impact on fish and wildlife habitat, and shall be aligned perpendicular to the stream channel if possible. The design of stream crossing shall be consistent with the WDFW Fish Passage Design at Road Culverts, 2003 and the National Marine Fisheries Service Guidelines for Salmonid Passage at Stream Crossings, 2000, as amended.

7-g. Active and water-dependent recreation. Swimming areas and fishing access may be located within riparian habitat areas and other aquatic buffers with minimal disturbance to riparian vegetation and no addition of impervious surfaces. Active use areas such as athletic fields, camping sites, and restrooms shall be located outside of buffers established for fish and wildlife habitat conservation areas.

17.32.040.4 Marking of Fish and Wildlife Habitat Conservation Areas. The outer perimeter of the habitat conservation area or buffer (riparian habitat areas or species points on the WDFW Priority Habitat and Species list) and the limits of those areas to be disturbed pursuant to an approved permit or authorization shall be marked in the field in such a way as to ensure that no unauthorized intrusion will occur and verified by the City prior to the commencement of permitted activities. This temporary marking shall be maintained throughout construction and shall not be removed until permanent signs or fencing, if required at the discretion of the City, are in place. Markers shall be placed to minimize disturbance to the habitat area.

17.32.040.5 Fish and wildlife habitat conservation areas- habitat management plans. In addition to the Critical Area Report requirements of subsection 17.32.030.2, projects on sites that contain all or a portion of fish and wildlife habitat conservation areas designated in sections 17.32.040.2(A) or (C) shall also complete a habitat management plan and submit the plan for approval with the development permit(s) required by this Title. The City *may* require a habitat management plan for projects with habitats or species 17.32.040.2(B) or (D). A required habitat management plan must be prepared by a habitat specialist or biologist and submitted with the development application. The contents of the habitat management plan are supplemental to the requirements of a Critical Area Report, as follows:

- A. Current aerial photograph of the site;
- B. An inventory of priority habitats and species as listed by the Washington State Department of Fish and Wildlife;

- C. A detailed description of the proposed development activity as it would potentially impact identified priority habitats or species;
- D. Proposed mitigation or management approaches consistent with the Washington State Department of Fish and Wildlife Management Recommendations for Priority Habitats and Species, or other state or federal guidelines, as applicable.

The City may require the applicant to provide proof of consultation with the Washington State Department of Fish and Wildlife in the development of a habitat management plan.

17.32.040.6 Fish and wildlife habitat conservation areas- special standards for riparian habitat areas. The following buffers are required to protect habitat areas on both sides of streams (for purposes of this section, stream typing is in accordance with WAC 222-16-031). Unless otherwise allowed in this Title, all structures and activities shall be located outside of the riparian habitat area:

A. ~~Riparian Habitat Areas:~~

Table 2. Stream types and buffer widths

Stream Type	Buffer Width
Types 1 and 2	250 feet See Table 4-1 in SMP
Type 2	250 feet
Type 3, 5-20 feet wide	200 feet
Type 3, less than 5 feet wide	150 feet
Types 4 and 5	150 feet

Commented [TB17]: Recommend separating these and, for Type 1 streams, referring to Table 4-1 in the SMP

B-A. Riparian habitat areas. Within riparian habitat areas, the following additional restrictions apply:

- a. No development activity that would require a permit under this Title, except for those uses exempted under section 17.32.030.5, is permitted within riparian habitat areas. Exempted activities are still subject to the requirements of this subsection for vegetation management.

- b. Any existing riparian vegetation within the habitat area shall be retained in natural state as much as is reasonably possible.
- c. Any modification to riparian vegetation within the riparian habitat area shall require review under this section and include a habitat management plan by a qualified biologist acceptable to the City. See subsection 17.32.040.2 for required contents of the habitat management plan.
- d. If vegetation requires removal for public health and safety purposes, or to control invasive species, methods nontoxic to salmonid species shall be preferred such as mechanical weed control without chemicals, or retaining tree canopy over lawn area for temperature control and or innovative approaches consistent with best available science to protect salmonid habitat.
- e. The City shall encourage restoration, mitigation and enhancement when proposed and monitored by a certified habitat biologist.

C.A. Measurement of riparian habitat area buffers. Width shall be measured outward in each direction, on the horizontal plane, from the ordinary high water mark, or from the top of bank, if the ordinary high water mark cannot be identified. For purposes of measuring the width of a riparian habitat area from a stream located in a ravine or with a bank sloped 30% or more, the management area width will be measured from the ordinary high water mark, up the bank slope, and then horizontally from the top of the bank for a distance not less than twenty-five feet, for a total management area width at least as wide as the required buffer area, and possibly wider.

D.B. Buffer aAveraging. The City may allow a riparian habitat area defined in this section to be reduced in accordance with a habitat management plan only if:

- 1.a. The width reduction will not reduce stream or habitat functions, including those of nonfish habitat;
- 2.b. The width reduction will not degrade the habitat, including habitat for anadromous fish;
- 3.c. The proposal will also provide additional habitat protection;
- 4.d. The total area contained in the riparian habitat area of each stream on the development proposal site is not decreased;
- 5.e. The recommended riparian habitat area width is not reduced by more than twenty-five percent (25%) in any one location;
- 6.f. The width reduction will not be located within another critical area or associated buffer; and
- 7.g. The reduced riparian habitat area width is supported by the best available science.

C. Alternative buffers. The applicant may provide a habitat management plan with alternative buffers to those proscribed in subsection A above, and include appropriate mitigations and enhancements of the riparian area to protect the critical values and functions of the riparian area. This plan must be created by a qualified professional and the plan must be reviewed and approved by the Washington State Department of Fish and Wildlife prior to submittal to the City. The plan must also meet the requirements of section 17.32.040.4, above.

~~—Within shoreline jurisdiction, any proposal to reduce riparian buffers beyond the averaging allowance in MMC 17.32.040(6)(D) requires a shoreline variance.~~

D.

E. Other riparian area management area regulations. The Lewis County ~~Shoreline Master Program (SMP)~~ shall also govern the uses permitted along designated shorelines in the City of Morton.

Commented [TC18]: MMC 17.32.040(6)(E) Periodic Checklist #7.

17.32.040.7 Fish and Wildlife Habitat Conservation Areas- Mitigation and Equivalent or Greater Biological Functions. Where there can be no avoidance of impact, mitigation of alterations to fish and wildlife habitat conservation areas shall achieve equivalent or greater biologic and hydrologic functions and shall include mitigation for adverse impacts upstream or downstream of the development proposal site. Mitigation shall address each function affected by the alteration and achieve functional equivalency or improvement for each function. Mitigation, if proposed, must be detailed as part of the habitat management plan required under section 17.32.040.5. The City may require periodic monitoring of mitigation activities.

Frequently flooded areas

17.32.045.1 Frequently flooded areas- purpose. The purpose of this section is to prevent damage to public health and safety, structures, and sensitive areas subject to flooding, and to coordinate review of projects under the critical areas regulations with review of projects under the City's Flood Damage Prevention Ordinance and other regulations.

17.32.045.2 Frequently flooded areas-designation. Frequently flooded areas shall include:

- A. Those lands within the floodway and areas of special flood hazard as determined by the most current mapping by the Federal Flood Emergency Management Act (FEMA) on the Flood Insurance Rate Maps (FIRMs) for the City of Morton and its environs (FIRM Community Panel No. 5301020505B and 5301050001C), which are available for review at the City or online at <http://www.fema.gov/>.
- B. Additional areas of special flood hazard identified by the City based on review of base flood elevation and floodway data available from federal, state, County, or other valid sources when base flood elevation data has not been provided from the Federal Insurance Administration (A and V zones of the FIRMs). The newest and most restrictive information about flood elevations and areas of known flooding shall be used by the City in reviewing projects subject to this Chapter. The City shall maintain for public inspection all records of floodplain hazards, certificates of flood proofing, and flood elevation data.
- C. Applicant may provide information. As part of the review process, the applicant may provide more detailed information which indicates that the mapping of the flood insurance program is in error or that their activities will not raise the flood elevation more than one foot. A letter from FEMA supporting the map change or activity is required before a development permit may be issued under this Title.

17.32.045.3 Frequently flooded areas- project review and permitting.

- A. Development projects proposed within a frequently flooded area must comply with the permitting and review requirements of City of Morton Ordinance No. 407, Flood Damage Prevention.
- B. Flood hazard assessment information shall be provided as part of the Critical Area Report pursuant to Section 17.32.045.3, with the following additional information added to that Report:
 - ~~a. a.~~—The location of any floodplain (100-year flood elevation), 10- and 50-year flood elevations, floodway, other critical areas, buffers, and shoreline areas;
 - ~~b. b.~~—Proposed development, including the location of existing and proposed structures, fill, storage of materials, and drainage facilities, with dimensions indicating distances to the floodplain;
 - c. Clearing limits; and
 - d. Elevation of the lowest floor (including basement) of all structures, and the level to which any nonresidential structure has been floodproofed.
- C. The ~~Morton-Lewis County Shoreline Master Program~~SMP shall further determine additional restrictions on uses and activities within the 100-year floodplain.

D. Where this section conflicts with Section 17.32.035, Fish and Wildlife Habitat Conservation Areas, the stricter of the sections apply.

17.32.045.4 Frequently flooded areas- special variance considerations.

A. The following special considerations apply to granting variances (pursuant to Section 17.60) to projects subject to this Section:

~~1.a.~~ The danger to life and property due to flooding, erosion damage, or materials swept onto other lands during flood events;

~~2.b.~~ The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the proposed use;

~~3.c.~~ The importance of the services provided by the proposed use to the community;

~~4.d.~~ The necessity to the proposed use of a waterfront location, where applicable, and the availability of alternative locations for the proposed use that are not subject to flooding or erosion damage;

~~5.e.~~ The safety of access to the property in times of flood for ordinary and emergency vehicles;

~~6.f.~~ The expected heights, velocity, duration, rate of rise, and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site; and

~~7.g.~~ The costs of providing governmental services during and after flood conditions, including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems and streets and bridges.

~~B.A.~~ Variances shall only be issued upon a determination that the granting of a variance will not result in increased flood heights, additional threats to public safety, extraordinary public expense, nuisances, fraud on or victimization of the public, or conflict with existing laws or ordinances.

~~C.A.~~ Variances shall not be issued within a designated floodway if any increase in flood levels during the base flood discharge would result.

Geologically hazardous areas

17.32.050.1 Geologically Hazardous Areas- designation. Geologically hazardous areas because of their susceptibility to erosion, sliding, earthquake, or other geological events are not suited to the siting of commercial, residential, or industrial development consistent with public health or safety concerns. The City of Morton designates the following as the only local Geologic Hazard Areas:

- A. Landslide hazard areas are those areas subject to mass movement due to a combination of geologic, topographic, and hydrologic factors, and include:
 - a. Any area with a combination of:
 - i. Slopes of 15% or steeper, and
 - ii. Impermeable subsurface material, or
 - iii. Springs or seeping groundwater from November to February.
 - b. Steep slopes of 40% or greater;
 - c. Any areas located on an area of known previous landslides to the Holocene Epoch movement (within 10,000 yrs); or
 - d. Any area potentially unstable as a result of rapid stream incision or stream bank erosion.

17.32.050.2 Permitted uses-Geotechnical Reports: For a site containing a landslide hazard area, a Geotechnical Report is required with submittal of any building application, in addition to the Critical Areas Report required under Section 17.32.030.2, as follows:

- A. **Geotechnical report requirements:** Geotechnical reports shall include the following:
 - a. Site plan, including height of slope, slope gradient, and cross-section of the project area, existing improvements, proposed improvements, and location and boundary of existing landslide hazard area and any other critical areas;
 - b. Water features, including the location and description of surface water runoff features and the location of springs, seeps, or other surface expressions of ground water on or within two hundred (200) feet of the project area or that have potential to be affected by the proposal;
 - c. Location and results of any test holes or excavations used to evaluate the existence of a landslide hazard;
 - d. Hazard analysis characterizing the type and extend of the landslide hazard, the type of vegetative cover; and
 - e. Certification by a geotechnical engineer or geologist preparing the study that:

- i. The risk of damage from the project, both on- and off-site is minimum;
- ii. The project will not increase the risk of occurrence of the hazard; and
- iii. The specific measures incorporated into the design and operation of the project to reduce the risk of damage from the hazard (see section 17.32.050.2(B)).

~~B. B.~~ **Specific engineering requirements.** The technical information for a project within a landslide hazard area shall include an engineering report prepared by a licensed engineer that includes:

- ~~a. i.~~ Parameters for design of site improvements including appropriate foundations and retaining structures. These should include allowable load and resistance capacities for bearing and lateral loads, installation considerations, and estimates of settlement performance;
- ~~b. ii.~~ Recommendations for drainage and subdrainage improvements;
- ~~c. iii.~~ Earthwork recommendations including clearing and site preparation criteria, fill placement and compaction criteria, temporary and permanent slope inclinations and protection, and temporary excavation support, if necessary;
- ~~iv. d.~~ Mitigation of adverse site conditions including slope stabilization measures and seismically unstable soils, if appropriate; and
- ~~v. e.~~ Recommendations for building siting limitations.

17.32.050.2 Landslide Hazard Area- specific standards. These standards apply to uses and activities not exempted under section 17.32.030.5:

A. **Buffer Requirement.** A fifty (50) foot buffer shall be established from the boundary of all landslide hazard areas as indicated in the Geotechnical Report. The size of the buffer may be increased by the City to eliminate or minimize the risk of property damage, death, or injury resulting from landslides caused in whole or part by the development, based upon review of and concurrence with a Critical Area Report and geotechnical report prepared by a qualified professional. The buffer may be reduced to a minimum of ten (10) feet when a qualified professional demonstrates to the City's satisfaction that the reduction will adequately protect the proposed development, adjacent developments, and uses and the subject critical area.

~~B. B.~~ **Alterations.** Alterations of a landslide hazard area and/or buffer may only occur for activities for which a hazards analysis is submitted and certifies that:

- a. ~~a.~~—The development will not increase surface water discharge or sedimentation to adjacent properties beyond pre-development conditions;
- b. ~~b.~~—The development will not decrease slope stability on adjacent properties; and
- c. Such alterations will not adversely impact other critical areas.

~~C. C.~~—**Design Standards.** Development within an erosion or landslide hazard area and/or buffer shall be designed to meet the following basic requirements unless it can be demonstrated that an alternative design that deviates from one or more of these standards provides greater long-term slope stability while meeting all other provisions of this Title. The requirement for long-term slope stability shall exclude designs that require regular and periodic maintenance to maintain their level of function. The basic development design standards are:

- a. ~~i.~~—The proposed development shall not decrease the factor of safety for landslide occurrences below the limits of 1.5 for static conditions and 1.2 for dynamic conditions. Analysis of dynamic conditions shall be based on a minimum horizontal acceleration as established by the current version of the adopted local building code;
- b. ~~ii.~~—Structures and improvements shall be clustered to avoid geologically hazardous areas and other critical areas;
- c. ~~iii.~~—Structures and improvements shall minimize alterations to the natural contour of the slope, and foundations shall be tiered where possible to conform to existing topography;
- d. ~~iv.~~—Structures and improvements shall be located to preserve the most critical portion of the site and its natural landforms and vegetation;
- e. ~~v.~~—The proposed development shall not result in greater risk or a need for increased buffers on neighboring properties;
- f. ~~vi.~~—The use of retaining walls that allow the maintenance of existing natural slope area is preferred over graded artificial slopes; and
- g. ~~vii.~~—Development shall be designed to minimize impervious lot coverage.

~~D. D.~~—**Vegetation Retention.** —Unless otherwise provided or as part of an approved alteration, removal of vegetation from a landslide hazard area or related buffer shall be prohibited, except that noxious weeds and invasive plants may be removed by hand labor or small scale motorized equipment, so long as the removal method does not pose a risk to slope stability or habitat functions;

~~E.~~—**Seasonal Clearing Restriction.** Clearing shall be allowed only from May 1 to October 1 of each year provided that the City may extend or shorten the dry season on a case-by-case basis depending on actual weather conditions, except that timber harvest, not including brush clearing or stump removal, may be allowed

pursuant to an approved forest practice permit issued by the City or the Washington State Department of Natural Resources.

H. F. Utility Lines and Pipes. -Utility lines and pipes shall be permitted in erosion and landslide hazard areas only when the applicant demonstrates that no other practical alternative is available. The line or pipe shall be located above ground and properly anchored and/or designed so that it will continue to function in the event of an underlying slide. -Stormwater conveyance shall be allowed only through a high-density polyethylene pipe with fuse-welded joints, or similar product that is technically equal or superior.

E.

F. -G. Point Discharges. -Point discharges from surface water facilities and roof drains onto or upstream from an erosion or landslide hazard area shall be prohibited except as follows:

a. i. -Conveyed via continuous storm pipe downslope to a point where there are no erosion hazards areas downstream from the discharge;

b. ii. -Discharged at flow durations matching predeveloped conditions, with adequate energy dissipation, into existing channels that previously conveyed stormwater runoff in the predeveloped state; or

c. iii. -Dispersed discharge upslope of the steep slope onto a low-gradient undisturbed buffer demonstrated to be adequate to infiltrate all surface and stormwater runoff, and where it can be demonstrated that such discharge will not increase the saturation of the slope.

G. H. Access roads. Access roads and utility corridors may be permitted within the landslide hazard area and associated buffers if the City determines that no other feasible alternative exists; and

I.H. Prohibited Development. On-site sewage disposal systems, including drain fields, shall be prohibited within landslide hazard areas and related buffers.

17.32.050.3 Erosion Control and Water Quality Monitoring. All development proposals must also meet the requirements of section 17.52, Erosion Control. In addition, if the City determines that there is a significant risk of damage to downstream receiving waters due to potential erosion from the site, based on the size of the project, the proximity to the receiving waters, or the sensitivity of the receiving waters, the technical information shall include a plan to monitor the surface water discharge from the site. The monitoring plan shall include a recommended schedule for submitting monitoring reports to the City.

Critical Aquifer Recharge Areas

17.32.055.1 Critical Aquifer Recharge Areas Designation and Mapping.

~~A. A.~~ Although the City’s main public water supply does not come from aquifer sources, the potential for groundwater contamination to affect private wells or water quality is a concern. Therefore the City designates Critical Aquifer Recharge Areas (CARAs) as those recharge areas identified as “severe” or “moderate” by Lewis County Public Works Department based on soil classification and depth to groundwater, and 5-year time of travel zones within designated Wellhead Protection Zones around Group A drinking water wells. Severe or moderate aquifer recharge areas encompass most of the City and part of the UGA. This designation assumes a high vulnerability to pollution. This designation is made based on information about soil type and topography, but due to the lack of specific hydrogeologic studies for Morton, the designation of a particular site may be challenged through a hydrogeologic assessment submitted as part of a development application.

~~B. B.~~ The location and extent of CARAs are shown on the adopted critical areas maps. Location data for Wellhead Protection Zones is maintained by the Washington State Department of Ecology. These maps are intended to be used as a guide for the City, project applicants, and/or property owners and may be continuously updated as new critical areas are identified. The maps are a reference and do not provide a final critical area designation.

17.32.055.2 Permitted Activities-- Hydrogeologic Assessment Required. Activities may only be permitted in a CARA if the applicant can show that the proposed activity will not cause contaminants to enter the aquifer and that the proposed activity will not adversely effect the recharging of the aquifer. In addition to the Critical Area Report requirements of Section 17.32.030.2, some activities proposed in a CARA are also subject to a hydrogeologic assessment as specified in this section. The following Table describes the allowed, permitted with review, and prohibited activities within a CARA.

Table 3. Activity or Use Requirements for CARAs

Activity/Use	Hydrogeologic Assessment Required?	Additional standards and conditions
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Activity/Use	Hydrogeologic Assessment Required?	Additional standards and conditions
Allowed activities		
A. New construction-- of structures and improvements, including additions, resulting in less than five percent (5%) or 2,500 square feet (whichever is greater) total site impervious surface area	No	Activity must not result in a change of use or increase the use of a hazardous substance.
B. Parks, recreation facilities, open space, or conservation areas— development or improvement resulting in less than five percent (5%) total site impervious surface area.	No	Activity must not increase the use of a hazardous substance.
C. Residential Application of Pesticides and Nutrients	No	Application of household pesticides, herbicides, and fertilizers shall not exceed times and rates specified on the packaging. If it is found that application has exceeded these requirements, a Level 1 assessment may be required.
D. On-site domestic septic systems-- releasing less than 14,500 gallons of effluent per day and that are limited to a maximum density of one (1) system per one-half (1/2) acre	No	Subject to standards specified in Chapter 246-272 WAC.
E. Stormwater management systems	No	Must use appropriate best management practices in design and operation.
F. Class V injection wells used only to manage residential or rural stormwater	No	
Permitted with review		
G. Construction activities that result in five percent (5%) or more impervious site area	Level 1	
H. Activities that divert,	Level 1	

Activity/Use	Hydrogeologic Assessment Required?	Additional standards and conditions
alter, or reduce the flow of surface or ground waters, or otherwise reduce the recharging of the aquifer		
I. Composting facilities, including storage of organic compost materials	Level 1	Materials must not contain hazardous substances.
J. Any other activity determined by the city likely to have an adverse impact on ground water quality or quantity or on the recharge of the aquifer	Level 1	
K. Underground Storage Tanks with hazardous substances or wastes	Level 2	Tanks shall be protected against corrosion, constructed of noncorrosive material, steel clad with a noncorrosive material, or designed to include a secondary containment system to prevent the release use material in the construction or lining of the tank that is compatible with the substance to be stored; and subject to standards of Chapter 173-360 WAC.
L. Aboveground Storage Tanks with hazardous substances or wastes	Level 2	Tanks shall not allow the release of a hazardous substance to the ground, ground waters, or surface waters; Tanks shall have a primary containment area enclosing or underlying the tank or part thereof; and Requires a secondary containment system either built into the tank structure or a dike system built outside the tank for all tanks; and Design and operation shall comply with Chapter 173-303-640 WAC.
M. Vehicle Repair and Servicing	Level 2	Activity must be conducted over impermeable pads and within a covered structure capable of withstanding normally expected weather conditions. Chemicals used must be stored in a manner that protects them from weather and provides containment should leaks occur.

Activity/Use	Hydrogeologic Assessment Required?	Additional standards and conditions
		The use of dry wells is prohibited, and dry wells existing on the site prior to facility establishment must be abandoned using techniques approved by the state Department of Ecology prior to commencement of the proposed activity. See Chapter 173-303 WAC.
N Use of Reclaimed Water for Surface Percolation or Direct Recharge	Level 2	<p>Water reuse projects for reclaimed water must be in accordance with the adopted water or sewer comprehensive plans that have been approved by the state departments of Ecology and Health.</p> <p>Use of reclaimed water for surface percolation must meet the ground water recharge criteria given in Chapter 90.46.080(1) and Chapter 90.46.010(10) RCW. The state Department of Ecology may establish additional discharge limits in accordance with Chapter 90.46.080(2) RCW. Direct injection must be in accordance with the standards developed by authority of Chapter 90.46.042 RCW.</p>
Q Land application of wastewater	Level 2	Shall be operated in accordance with Chapter 173-216 WAC, Chapter 173-200 WAC, Washington State Department of Ecology Land Application Guidelines, Best Management Practices for Irrigated Agriculture.
P Sand and gravel mining	Level 2	Subject to Chapter 332-18-015 WAC
Q Automobile Washers	Level 2	Subject to Chapter 173-216 WAC, Best Management Practices for Vehicle and Equipment Discharges (Washington Department of Ecology WQ-R-95-56)
R Chemical Treatment Storage and Disposal Facilities	Level 2	Subject to Chapter 173-216 WAC and Chapter 173-220 WAC
S Hazardous Waste	Level 2	Subject to Chapter 173-303 WAC.

Activity/Use	Hydrogeologic Assessment Required?	Additional standards and conditions
Generators, including but not limited to: Boat Repair Shops, Biological Research Facility, Dry Cleaners, Furniture Stripping, Medical Waste Processing, Photographic Processing, Printing and Publishing Shops, etc.		
T- Commercial Pesticide Storage and Use	Level 2	Subject to Chapter 15.54 RCW, Chapter 17.21 RCW
U- Sawmills	Level 2	Subject to Chapter 173-303 WAC, Chapter 173-304 WAC, Best Management Practices to Prevent Stormwater Pollution at Log Yards (Washington State Department of Ecology, 95-53)
V- On-Site Sewage Systems- Large scale or at densities greater than one septic system per ½ acre	Level 2	
W- Oil and Gas Drilling	Level 2	Subject to Chapter 332-12-450 WAC and Chapter 173-218 WAC
Prohibited Uses		
X- Animal Feedlots, defined as confined animal feeding operations (CAFOs) used for fattening livestock prior to slaughter and that require a state or federal permit for operation	N/A	
Y- Junk Yards and Salvage Yards	N/A	
Z- Landfills	N/A	Hazardous or dangerous waste (Chapter 173-303 WAC- Dangerous Waste Regulations) landfills are prohibited. Municipal solid waste landfills or interim solid waste facilities are permitted if properly permitted by the State, if required, and operated in accordance with Chapter 173-304 WAC (Minimum Functional Standards for Solid Waste Handling) and Chapter 173-351 WAC (Criteria for

Activity/Use	Hydrogeologic Assessment Required?	Additional standards and conditions
		Municipal Solid Waste Landfills).
AA Underground Injection Wells: Class I, III, and IV wells and subclasses 5F01, 5D03, 5F04, 5W09, 5W10, 5W11, 5W31, 5X13, 5X14, 5X15, 5W20, 5X28, and 5N24	N/A	Chapter 173-218 WAC. Excludes permitted aquifer remediation wells permitted by the Washington State Department of Ecology.
BB Mining- metals and hard rock	N/A	
CC Wood Treatment Facilities that allow any portion of the treatment process to occur over permeable surfaces (both natural and manmade)	N/A	
DD Storage, Processing, or Disposal of Radioactive Substances	N/A	
EE Activities that would significantly reduce the recharge to aquifers currently or potentially used as a potable water source	N/A	
FF Activities that would significantly reduce the recharge to aquifers that are a source of significant baseflow to a regulated stream	N/A	

17.32.055.3 Hydrogeologic assessment contents.

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~~A. A.~~ **Level One Hydrogeologic Assessment.** A level one hydrogeologic assessment is submitted along with the Critical Area Report required in Section 17.32.030.2, and shall include the following information:

- ~~a. 1.~~ Available information regarding geologic and hydrogeologic characteristics of the site including the time of travel zone associated with the Wellhead Protection Area, as applicable, and permeability of the unsaturated zone;
- ~~b. 2.~~ Groundwater depth, flow direction, and gradient based on available information (such as from well logs);
- ~~c. 3.~~ Currently available data on the location of wells, springs, surface waters, and other critical areas on the project site and on all immediately adjacent properties;
- ~~d. 5.~~ Historic water quality data for the area to be affected by the proposed activity, as reasonably available; and
- ~~e. 6.~~ Best management practices proposed to be utilized.

~~B. B.~~ **Level Two Hydrogeologic Assessment.** A level two hydrogeologic assessment shall include the following information, in addition to the requirements for a level one hydrogeological assessment:

- ~~i. 1.~~ Historic water quality data for the area to be affected by the proposed activity compiled for at least the previous five (5) year period, or as reasonably available;
- ~~a. 2.~~ Groundwater monitoring plan provisions;
- ~~b. 3.~~ Assessment of the effects of the proposed project on groundwater quality and quantity, including:
 - ~~ii. a.~~ Predictive evaluation of groundwater withdrawal effects on nearby wells and surface water features; and
 - ~~iii. b.~~ Predictive evaluation of contaminant transport based on potential releases to ground water; and
- ~~c. 4.~~ A spill plan that identifies equipment and/or structures that could fail, resulting in an impact. Spill plans shall include provisions for regular inspection, repair, and replacement of structures and equipment that could fail.

C. Preparation by a Qualified Professional. A Level 1 or Level 2 hydrogeologic assessment shall be prepared by a qualified professional who is a hydrogeologist, geologist, or engineer, who is licensed in the state of Washington and has experience in preparing hydrogeologic assessments.

17.32.055.4 Additional conditions. The City may condition activities within CARAs with the requirement that the activities employ AKART (all known, available, and reasonable treatment) to ensure the highest degree of protection is afforded to the aquifer.

Definitions (all new):

“Area of special flood hazard” means the land in the floodplain within a community subject to a one percent or greater chance of flooding in any given year. Designation on the Flood Insurance Rate Map (FIRM) always includes the letters A or V.

“Best Management Practices” means conservation practices or systems of practices and management based on best available science that control soils erosion, reduce water quality degradation, minimize adverse impacts to surface and groundwater flow, circulation patterns, and to the chemical, physical, and biological characteristics of critical areas.

“Critical Areas” includes wetlands, frequently flooded areas, geologically hazardous areas including steep slopes, fish and wildlife habitat areas, and critical aquifer recharge areas.

“Critical area buffer” means that area which surrounds and protects a critical area from adverse impacts to the functions of that area, minimizes public safety risks, and/or which may provide wildlife habitat integrally related to the critical area.

“Critical aquifer recharge areas” (CARAs) are those areas with a critical recharging effect on aquifers used for potable water as defined by WAC 365-190-030(2), including 5-year time of travel zones within designated Wellhead Protection Zones for Group A wells regulated by the Federal Safe Drinking Water Act.

“Designated wellhead protection area” means the surface and subsurface area surrounding a water well or well field, supplying a public water supply system with over one thousand connections, through which contaminants are reasonably likely to move toward and reach such well or well field within one, five and ten years, respectively. A designated wellhead protection area is an area

for which the water purveyor has adopted a wellhead protection plan and the plan has been approved by the Washington State Department of Health.

“Fish and Wildlife Habitat Conservation Areas” are areas necessary for maintaining species in suitable habitats within their natural geographic distribution so that isolated subpopulations are not created as designated by WAC 365-190-080(5). The extent of the area is determined by application of best available science, which includes Washington State Department of Fish and Wildlife recommendations for buffers associated with Priority Habitats and Species.

“Floodway” means the channel of a river or other watercourse and the adjacent land area that must be reserved in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.

“Geologic hazard areas” are defined in WAC 365-190-030(8) as “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.”

“Habitat management plan” is a written report prepared by a qualified professional biologist with habitat or species description and including the information required by this Title.

“Mitigation” or “compensatory mitigation” means replacing project-induced critical area losses or impacts, and includes, but is not limited to, restoration, creation or enhancement.

“Project site” means the legal boundaries of the parcel or parcels of on which an applicant has applied for authority from the City of Morton to carry out a development proposal.

“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 non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lines swales, canals, detention facilities, wastewater treatment facilities, farm ponds, ponds or lakes created as a result of mineral extraction, 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 non-wetland areas created to mitigate conversion of wetlands.

“Wetland categories” means categories established by *Wetlands in Washington State, Volume II, DOE and The Washington State Wetland Rating System for Western Washington* (*Ecology Publication #14-06-029*). As pertinent to the City of Morton and its UGAs, these categories are defined as follows:

- a. Category I. Category I wetlands include wetlands that are unique or rare; particularly sensitive to disturbance; relatively undisturbed with ecological attributes that are impossible to replace within a human lifetime; or that provide a high level of functions. They include:
 - ~~a.i.~~ Wetlands of High Conservation Value (WHCV) (previously Natural Heritage Wetlands) designated by the Washington Department of Natural Resources (DNR) Natural Heritage Program⁴ due to their high quality and relatively undisturbed condition, or because they support plants listed by the DNR Natural Heritage Program as threatened or endangered;
 - ~~b.ii.~~ Bogs larger than ½ acre;
 - ~~e.iii.~~ Mature and old growth forested wetlands larger than one acre;
 - ~~d.iv.~~ Wetlands with a total score for functions of 70-23 or more points under the Wetland Rating System for Western Washington.
- b. Category II. Category II wetlands provide high levels of some functions and are difficult, though not impossible, to replace. They include:
 - ~~a.~~ a. Wetlands identified by the DNR Natural Heritage Program as

⁴ [Data Products and Requests | WA - DNR](#)

~~containing "sensitive" plant species;~~

~~c. Bogs between one fourth (1/4) and one half (1/2) acre in size; and~~

~~e. d. Wetlands with functions scoring between ~~51-20~~ and ~~22-69~~ points under the Wetland Rating System for Western Washington, DOE, 2004.~~

~~1.~~

~~c.~~ Category III. Category III wetlands have functions scoring between ~~30-16~~ and ~~50-19~~ points under the Wetland Rating System for Western Washington, DOE, 2004. Typically, they have been disturbed and contain less diverse wildlife habitat or are more isolated from other habitat than Category II wetlands.

~~d.~~ Category IV. Category IV wetlands have levels of functions scoring ~~16-29~~ or fewer points under the Wetland Rating System for Western Washington, 2004. Typically, they are extensively altered.

Commented [AC19]: Periodic Checklist 2023b.

Resource List And Citations

Assessing Earthquake Hazards and Reducing Risk in the Pacific Northwest, Albert M. Rogers, Timothy J. Walsh, William J. Koekelman, and George R. Priest, Editors Volume 2, USGS 1998, U.S. GEOLOGICAL SURVEY Professional Paper 1560

• General assessment of earthquake risks in the region. Cites rockfall near Morton along Cowlitz River from previous quake.

• Rockfalls typically on sites of 45 degrees or more steep slopes.

<http://pubs.usgs.gov/prof/p1560/p1560po.pdf> ??

Commented [TC20]: Broken link. No description?

Bolton, S. (2001). Ecological Issues in Floodplains and Riparian Corridors. University of Washington Center for Streamside Studies and Washington State Department of Transportation. Seattle. WA.

Critical Aquifer Recharge Areas Guidance Document. Prepared by: Laurie Morgan Washington State Department of Ecology Water Quality Program January 2005 Publication Number 05-10-028 <http://www.ecy.wa.gov/biblio/0510028.html>

Brazier, J. R. and Brown, G. W., (1973)., "Buffer Strips for Stream Temperature Control," Forest Research Laboratory, School of Forestry, Oregon State University, Corvallis, OR.

Castelle, A. Andrew and A.W. Johnson, (2000)., "Riparian Vegetation Effectiveness," National Council for Air and Stream Improvement, Technical Bulletin No. 799, Research Triangle Park, NC., February 2000

Cederholm, C. J., et. al. (2001). Pacific salmon and wildlife-ecological contexts, relationships, and implications for management. Wildlife-habitat relationships in Oregon and Washington. Oregon State University Press, Corvallis, Oregon, 628-685. Cederholm, C. J., et. Al. 2000. Pacific Salmon and Wildlife Ecological Contexts, Relationships, and Implications for Management. Special Edition Technical Report, Washington Department of Fish and Wildlife.

DNR. (2000 and 2004 (draft)) Forest Practices Board Manual, Section 16 Guidelines for Evaluating Potentially Unstable Slopes and Landforms. Washington Department of Natural Resources (DNR). Accessed at <http://www.dnr.wa.gov/forestpractices/board/manual/>.

Ecology. (1992). Wetland Replacement Ratios: Defining Equivalency. Washington State Department of Ecology (Ecology) Publication #92-08.

Ecology. (1993). Slope Stabilization and Erosion Control Using Vegetation. Publication No. 93-30, Olympia, WA Accessed at <http://www.ecy.wa.gov/programs/sea/pubs/93-30/index.html>.

Ecology. (2005). Wetlands in Washington - Volume 1: A Synthesis of the Science (Publication #05-06-006), Washington State Department of Ecology (Ecology). Accessed at http://www.ecy.wa.gov/programs/sea/bas_wetlands/volume1final.html.

Ecology. (2005). Wetlands in Washington - Volume 2: Guidance for Protecting and Managing Wetlands (Publication #05-06-008), Washington State Department of Ecology (Ecology). Accessed at http://www.ecy.wa.gov/programs/sea/bas_wetlands/volume2final.html.

Ecological Issues in Floodplains and Riparian Corridors, University of Washington Center for Streamside Studies, 2001.

- Describes the ecological/habitat functions of streams in Pacific Northwest.
- Channelization stresses habitat and species and changes temperature, turbidity, flow velocity, and other factors.

ECY. (2018). Appendix 8 C: Guidance on buffers and ratios for Western Washington wetlands in Washington State volume 2—Protecting and managing wetlands. Washington State Department of Ecology (ECY). Retrieved from <https://apps.ecology.wa.gov/publications/parts/0506008part3.pdf>

ECY. (2018). Appendix 8 C: Guidance on buffers and ratios for Western Washington wetlands in Washington State volume 2—Protecting and managing wetlands. Washington State Department of Ecology (ECY). Retrieved from <https://apps.ecology.wa.gov/publications/parts/0506008part3.pdf>

FEMA Federal Flood Insurance Rate Maps. (2025). Accessed at www.fema.gov.

• ~~Morton does not contain shallow flooding areas (AO Zones)~~

Harris, R.R., ~~S.D. Kocher, J.M. Gerstein and C. Olson et. al.~~ (2005). Monitoring the Effectiveness of Riparian Vegetation Restoration. University of California, Center for Forestry, Berkeley, CA. 33.

• ~~Discusses the relative successes of different restoration projects.~~

Hruby, T. (2014). Washington State wetland rating system for Western Washington. Olympia: Washington State Department of Ecology (WDOE).

Hruby, T., & Yahnke, A. (2023). Washington State Wetland Rating System for Western Washington: 2014 Update (Version 2). Publication #23-06-009. Washington Department of Ecology.

~~Hruby, Thomas. Washington State Wetland Rating System for Western Washington. Washington State Department of Ecology publication no. 04-06-015 <http://www.ecy.wa.gov/biblio/0406025.html>~~

• ~~Describes functions and values of different wetland types in W. Washington.~~

Commented [AC21]: Periodic Checklist 2023b.

Johnson, A.W. and D.M. Ryba, (1992). A Literature Review of Recommended Buffer Widths to Maintain Various Functions of Stream Riparian Areas. Prepared for King County Surface Water Management Division, Department of Natural Resources, Seattle, WA, by Aquatic Resource Consultants, Seattle, WA, and Puget Sound Native Plants, Renton, Washington.

Larsen, Eric & Rodrick, Elizabeth & Milner, Ruth. (2001). Management Recommendations for Washington's Priority Species Volume I: Invertebrates. *Priority Habitats and Species List*. Washington Department of Fish and Wildlife. Accessed at <http://wdfw.wa.gov/hab/phslist.htm>.

Lewis County Public Works. (2025). Lewis County Hazard Mitigation Plan (draft), Accessed at http://www.co.lewis.wa.us/PublicWorks/GIS/HMP_Web/HMP.htm.

~~Landslides and Landslide Hazards in Washington State Due to February 5-9, 1996 Storm. USGS.~~

U.S. Geological Survey, Geologic Hazards Team, 1711 Illinois St., Golden, CO 80401 and
U.S. Geological Survey, 345 Middlefield Rd., Menlo Park, CA 94025
http://landslides.usgs.gov/learningeducation/docs/Wash_hrp.pdf

- No immediate future landslide threat identified in Morton area. Discussion of general causes behind actual landslides in Washington.

Lewis County Hazard Mitigation Plan (draft), Lewis County Public Works.

http://www.co.lewis.wa.us/PublicWorks/GIS/HMP_Web/HMP.htm

- Contains hazard map of Morton area (no landslide hazards specifically identified; flood zones only)

Mayer, P.M., S.K. Reynolds, M.D. McCutchen, and T.J. Canfield. (2006). Riparian buffer width, vegetative cover, and nitrogen removal effectiveness: A review of current science and regulations. EPA/600/R-05/118. Cincinnati, OH, U.S. Environmental Protection Agency; 2006.

McMillan, Andy. State Wetlands Delineation Manual. (1996). Washington State Department of Ecology publication no. 96-94. <http://www.ecy.wa.gov/biblio/9694.html>.

Morgan, L. (2005). Critical Aquifer Recharge Areas Guidance Document. Washington State Department of Ecology (Ecology) Water Quality Program. Publication # 05-10-028
Accessed at <http://www.ecy.wa.gov/biblio/0510028.html>.

NatureServe Explorer, Accessed at www.natureserve.org

Thus, wider buffers are more likely to be efficient zones of nitrogen removal, whereas, narrower buffers may not always remove significant portions of nitrogen.

Rogers, AM., et. al. (1998). Assessing Earthquake Hazards and Reducing Risk in the Pacific Northwest, Editors Volume 2, USGS Professional Paper 1560.

- Grass buffers were significantly less effective than forest buffers at removing nitrogen
- Based on current studies, riparian buffers of various types are effective at reducing nitrogen in riparian zones, especially nitrogen flowing in the subsurface. Buffers generally are more effective where soil type, hydrology, and biogeochemistry

- ~~are conducive to microbial denitrification and plant uptake. While some narrow buffers (1-15 m) removed nitrogen, wider buffers (>50 m) more consistently removed significant portions of nitrogen probably by providing more area for root uptake of nitrogen or more sites for denitrification.~~

~~Salmon and Steelhead Habitat Inventory and Assessment Program, Washington State Department of Fish and Wildlife.~~

- ~~Databases provided information on fish species on Morton streams~~

Sidle, R. C., and A.J. Pearce, and L.L. O'Loughlin. (1985). Hillslope stability and land use. Water Resources Monograph Series edition. Volume 11. American Geophysical Union, Washington. D.C.

Spence, B.C., G.A. Lomnicky, R.M. Hughes, and R.P. Novitzki. (1996). An ecosystem approach to salmonid conservation. TR-4501-96-6057. ManTech Environmental Research Services Corp., Corvallis, OR. Accessed at <http://www.nwr.noaa.gov/Publications/Guidance-Documents/upload/mantech-partI.pdf>.

- ~~Regardless of land use type, riparian buffers are recommended on all streams; their dimensions will depend on the setting and level of protection desired.~~
- ~~Riparian vegetation provides numerous functions including shading, stabilizing streambanks, controlling sediments, contributing large woody debris and organic litter, and regulating the flux and composition of nutrients~~
- ~~Three important considerations in establishing buffer zones are: 1) the width of the buffer zone, 2) the level of activity allowed within the riparian zone, and 3) whether riparian buffers are needed for tributary streams that do not contain salmonids. Appropriate buffer widths are the topic of much debate and a number of alternative approaches for determining adequate buffer widths have been proposed. The appropriate width of buffer zones depends on the specific functions that are being considered.~~

Spiker, Elliott C., Gori, P. (2003). National landslide hazards mitigation strategy- a framework for loss reduction. Circular 1233. U.S. Geological Survey, Reston, VA. <http://pubs.usgs.gov/circ/c1244/c1244.pdf>

SWAP. (2005). Washington's Source Water Assessment Program (SWAP) Washington State Department of Health (WDOH). Accessed at http://www.doh.wa.gov/ehp/dw/Publications/331-148_washington_source_water_assessment_program_6-22-05_web.pdf.

- Land use planning is one of the most effective and economical ways to reduce landslide losses by avoiding the hazard and minimizing the risk.
- Control of surface water and ground water drainage is the most widely used and generally the most successful slope stabilization method.

Washington Department of Ecology. 1993. Slope Stabilization and Erosion Control Using Vegetation. Publication No. 93-30, Olympia, WA

- WDFW. (1997). When properly installed and maintained, vegetation can protect slopes by reducing erosion, strengthening soil, and inhibiting landslides which increase general slope stability. The use of vegetation to manage erosion and protect slopes is relatively inexpensive, does not require heavy machinery on the slope, establishes wildlife habitat, and can improve the aesthetic quality of the property. (guidance mostly applicable to coastal areas)

Washington Department of Fish and Wildlife Management Recommendations for Washington's Priority Habitats: Riparian, 1997. Accessed at <http://wdfw.wa.gov/hab/phsrecs.htm>.

WDFW (2025). Salmon and Steelhead Habitat Inventory and Assessment Program, Washington State Department of Fish and Wildlife (WDFW). Accessed at <http://wdfw.wa.gov/hab/sshiap/>.

WDFW (2025).

Washington Department of Fish and Wildlife Habitats and Species Information, Accessed at http://wdfw.wa.gov/hab/phsorder_may1706.pdf.

- Report of Morton area PHS species and habitat locations generated

~~Washington Department of Natural Resources (DNR), March 2000 and July 2004 (draft) Forest Practices Board Manual, Section 16 Guidelines for Evaluating Potentially Unstable Slopes and Landforms. <http://www.dnr.wa.gov/forestpractices/board/manual/>~~

- ~~• Description of different landslide hazards and processes.~~
- ~~• Description of recommended contents of geotechnical report.~~

~~Wetlands in Washington—Volume 1: A Synthesis of the Science (Publication #05-06-006), Washington State Department of Ecology~~

~~http://www.ecy.wa.gov/programs/sea/bas_wetlands/volume1final.html~~

~~Wetlands in Washington—Volume 2: Guidance for Protecting and Managing Wetlands (Publication #05-06-008), Washington State Department of Ecology~~

~~Wetland Replacement Ratios: Defining Equivalency, Washington State Department of Ecology, 1992, Publication #92-08.~~

- ~~• Ratios for wetland mitigation defined and discussed (applied to this draft).~~
- ~~• Establishes rating system (point based) for wetland function and relative value.~~

~~McMillan, Andy. State Wetlands Delineation Manual, 1996. Washington State Department of Ecology publication no. 96-94. <http://www.ecy.wa.gov/biblio/9694.html>~~

- ~~• Washington State's official manual for delineating wetlands. Delineation manuals are used to determine the edge of a wetland based on three "parameters:" water, plants, and soil.~~
- ~~• Guidelines and methods to determine whether an area is a wetland and to delineate its boundaries for purposes of Section 404 of the federal Clean Water Act, the state Shoreline Management Act, or local regulations adopted under requirements of the Growth Management Act.~~

Management Recommendations for Washington's Priority Habitat and Species, Elizabeth Rodrick and Ruth Milner, Washington Department of Fish and Wildlife, 1991.

Priority Habitats and Species List, Washington Department of Fish and Wildlife.
<http://wdfw.wa.gov/hab/phslist.htm>

NatureServe Explorer, www.natureserve.org

• Provides information (county level) on important species and habitats found in the area.

Washington State Wellhead Protection Program Guidance Document, Washington State Department of Health Publication #331-018, April 1995

Washington's Source Water Assessment Program (SWAP), June 2005. Washington State Department of Health

<http://www.doh.wa.gov/ohp/dw/Publications/331-148-washington-source-water-assessment-program-6-22-05-web.pdf>USGS. (1962). *Water Supply Bulletin No. 17, Geology and Groundwater Resources of West-Central Lewis County, WA*. Weigle, J.M. and B.L. Foxworthy. Accessed at http://www.ecy.wa.gov/programs/eap/wsb/pdfs/WSB_17_Book.pdf.

USGS. Geological Survey (U.S.), & Harp, E. L. (1997). *Landslides and landslide hazards in Washington State due to February 5-9, 1996 storm*. [Reston, Va.?]: U.S. Dept. of the Interior, U.S.

USGS (2025). *Landslide Hazards Program*. Accessed at http://landslides.usgs.gov/learningeducation/docs/Wash_hrp.pdf.

WDOH. (1995). *Washington State Wellhead Protection Program Guidance Document*, Washington State Department of Health (WDOH). Publication #331-018.

• Also used interactive GIS map to identify Group A wells in Morton area and determine vulnerability.

Washington State Department Of Community, Trade, And Economic Development, Model Critical Areas Ordinance and Citations Of Recommended Sources Of Best Available Science For Designating And Protecting Critical Areas. Accessed at http://qa.cted.wa.gov/_cted/documents/id_874_publications.pdf.

~~Water Supply Bulletin No. 17, Geology and Groundwater Resources of West Central Lewis County, WA, Weigle, J.M. and B.L. Foxworthy, USGS, 1962~~

~~• General description of geologic and hydrologic processes and forms in the area.~~