



**CITY OF BLACK DIAMOND**  
**September 25 2008 Workstudy Agenda**  
25510 Lawson St., Black Diamond, Washington

**7:00 P.M. – CALL TO ORDER, FLAG SALUTE, ROLL CALL**

**1.) Updated Sensitive Area Ordinance/Best Available Science White Paper** Mr. Nix

**ADJOURNMENT:**



## CITY OF BLACK DIAMOND

### Interoffice Memorandum

**TO:** MAYOR AND COUNCIL MEMBERS  
**FROM:** AARON NIX, NATURAL RESOURCES DIRECTOR  
**SUBJECT:** UPDATED SENSITIVE AREA ORDINANCE/BEST AVAILABLE SCIENCE  
WHITE PAPER  
**DATE:** 9/19/2008

Honorable Mayor and Council Members,

We've finally completed the updated Sensitive Areas Ordinance and Best Available Science White Paper as per the Council direction. I've included both for your review and comment at the September 25, Council Study Session. As you'll see, significant work has been done in regards to implementing the Best Available Science into the types of sensitive areas we are fortunate to have here in Black Diamond. I hope you'll find that staff has worked very hard to find a balance between the protection of the environment, while allowing development and growth to occur under the requirements placed on us under the Growth Management Act. My belief is that this work product will allow both of these important items to occur, while not sacrificing the inherent beauty and quality of life that residents of Black Diamond have come to expect. Thanks for the opportunity to visit this issue and I hope for an active, productive meeting on Thursday.

Please call me if you have any questions prior to the study session!

Thanks,

Aaron C. Nix  
Natural Resources Director  
X220

**ORDINANCE NO. 08-\_\_\_\_\_**

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF BLACK DIAMOND, KING COUNTY WASHINGTON, ADOPTING A NEW SENSITIVE AREAS ORDINANCE AND ADDING A NEW CHAPTER 19.10 TO THE BLACK DIAMOND MUNICIPAL CODE AND AMENDING SECTION 19.12.040 AND THE TITLE TO CHAPTER 19.12 OF THE BLACK DIAMOND MUNICIPAL CODE

WHEREAS, the Growth Management Act requires cities and counties planning under it to periodically review, and, if needed, revise their sensitive areas ordinances to ensure compliance with the Growth Management Act; and

WHEREAS, RCW 36.70A.172 requires local governments to include the “best available science” in preparing policies and regulations to protect the functions and values of critical areas, giving special consideration to the conservation and protection measures necessary to preserve or enhance anadromous fisheries; and

WHEREAS, the last major updates to the City’s sensitive areas regulations occurred in 1993; and

WHEREAS, the Planning Commission reviewed the proposed sensitive areas ordinance at a public meeting on \_\_\_\_\_, and recommended that the City Council adopt the ordinance; and

WHEREAS, the City Council held duly notice public hearings on the proposed sensitive areas ordinance on October 4, 2007, February \_\_\_\_, 2008; and October \_\_\_\_, 2008;

WHEREAS, a Determination of Non-Significance was issued pursuant to the State Environmental Policy Act on \_\_\_\_\_ by the City’s Responsible Official, and

WHEREAS, on \_\_\_\_\_, the City submitted the proposed sensitive areas ordinance to Washington State Department of Trade and Community Development for review pursuant to RCW 36.70A.106; and

WHEREAS, RCW 36.70A.560 prohibits counties and cities, for the period beginning May 1, 2007, and concluding July 1, 2010, from amending or adopt sensitive area ordinances as they specifically apply to agricultural activities, as defined therein; therefore agricultural activities shall be exempt from this sensitive areas ordinance and the provisions of BMC Chapter 19.12 in effect prior to this amendment shall remain in full force and effect as to agricultural activities only; and

WHEREAS, the proposed sensitive areas ordinance is based on analysis of ecosystem functions and values in the City, Urban Growth Area and surrounding areas that documents that the “core” complex of wetlands along Rock Creek, Jones Lake, Jones Creek, Black Diamond Lake and Black Diamond Creek is an area of intensive processes that contributes disproportionate positive values to critical area functions and water quality in Lake Sawyer and therefore warrants a high level of protection and conservation, and

WHEREAS, the proposed sensitive areas ordinance provides for protection of sensitive areas in a manner that assures protection of the ecological functions and values of sensitive areas and provides special consideration to the preservation and conservation measures necessary to preserve and enhance anadromous fisheries, while appropriately balancing other goals of the Growth Management Act as provided in RCW 36.70A.020; NOW THEREFORE,

THE CITY COUNCIL OF THE CITY OF BLACK DIAMOND, KING COUNTY, WASHINGTON, ORDAINS AS FOLLOWS:

SECTION 1. The City Council adopts the Findings of Fact attached thereto as Exhibit A, and incorporated herein by reference.

SECTION 2. A new Chapter 19.10 of the Black Diamond Municipal Code, titled “Sensitive Areas” is added to read as follows:

**Chapter 19.10**  
**SENSITIVE AREAS**

<b>Section:</b>	
<b>19.10.005</b>	<b>General provisions</b>
<b>19.10.010</b>	<b>Purpose</b>
<b>19.10.020</b>	<b>Applicability and Jurisdiction</b>
<b>19.10.030</b>	<b>Relationship to other Regulations</b>
<b>19.10.050</b>	<b>Mitigation</b>
<b>19.10.060</b>	<b>Allowed Activities</b>
<b>19.10.080</b>	<b>Exceptions</b>
<b>19.10.100</b>	<b>Sensitive Area Determination and Reports</b>
<b>19.10.110</b>	<b>Sensitive Area Pre-Application Meeting</b>
<b>19.10.120</b>	<b>Sensitive Area Permit Review</b>
<b>19.10.130</b>	<b>Sensitive Area Reports</b>
<b>19.10.140</b>	<b>Mitigation Plans</b>
<b>19.10.150</b>	<b>Notice on Title</b>
<b>19.10.160</b>	<b>Building Setbacks</b>
<b>19.10.170</b>	<b>Non-conforming Development</b>

- 19.10.180 Administration
- 19.10.190 Appeals
  
- 19.10.200 Wetlands
- 19.10.210 Designation, rating and mapping wetlands
- 19.10.220 Use and activities allowed in wetlands
- 19.10.230 Wetland Buffers
- 19.10.235 Provisions for Small Isolated Wetlands
- 19.10.240 Mitigation Requirements
- 19.10.250 Wetland Mitigation Plan
- 19.10.260 Wetland Mitigation Monitoring
  
- 19.10.300 Fish and Wildlife Conservation Areas
- 19.10.310 Designation and Mapping
- 19.10.320 Designation Fish and wildlife habitat conservation areas  
– Water bodies
- 19.10.325 Fish and wildlife habitat conservation areas – Water  
bodies – Buffers
- 19.10.327 Anadromous Fish
- 19.10.328 Culvert Replacement
- 19.10.330 Activities allowed in waterbodies and habitat buffers
- 19.10.335 Other Than Fish and Wildlife Habitat Conservation  
Areas
- 19.10.337 Fish and Wildlife Habitat Conservation Areas - Review  
and Reporting Requirements
- 19.10.340 Mitigation Requirements
  
- 19.10.400 Geologically Hazardous Areas
- 19.10.405 Designation and mapping
- 19.10.410 Development Standards – Landslide Hazard Areas
- 19.10.415 Landslide Hazard Review and Reporting Requirements
- 19.10.420 Development Standards – Erosion Hazard Areas:
- 19.10.425 Erosion Hazard Areas Review and Reporting  
Requirements
- 19.10.430 Mine Hazard Areas
- 19.10.435 Mine Hazard Review and Reporting Requirements
- 19.10.440 Seismic Hazard Areas
- 19.10.445 Seismic Hazard Review and Reporting Requirements
- 19.10.500 Critical Aquifer Recharge Areas
  
- 19.10.600 Definitions

**19.10.005 General Provisions**

BMC 19.10.005 to BMC 19.10.190 are general provisions pertaining to sensitive areas.

**19.10.010 Purpose**

This chapter has been enacted for the following purposes:

- A. To designate and classify sensitive areas and their ecosystems and to protect these areas and their functions and values using the best available science, giving special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries, while recognizing and allowing for reasonable use of private property;
- B. To limit development and alteration of sensitive areas to achieve the goal of no net loss of sensitive areas or their functions and values;
- C. To protect members of the public and public resources and facilities from public health or safety concerns, including injury, loss of life, or property damage due to events such as landslides and steep slope failures, erosion, seismic events, and mine hazards;
- D. To provide for compatible land use on or adjacent to sensitive areas and direct activities not compatible with sensitive areas resources to less ecologically sensitive sites and mitigate unavoidable adverse impacts to sensitive areas by regulating alterations in and adjacent to sensitive areas; and
- E. To prevent cumulative adverse environmental impacts to sensitive areas resulting from many individual actions.

Add a statement about the “core” area and hierarchy of protection envisioned in the regulations.

**19.10.020 Applicability and Jurisdiction**

- A. This chapter shall apply to all uses, activities, and developments undertaken within or adjacent to one or more sensitive areas and their ecosystems, including buffers as designated herein. Sensitive areas designated and regulated by this chapter include:
  - 1. Wetlands;
  - 2. Fish and wildlife conservation areas;
  - 3. Geologically hazardous areas.
  - 4. Critical aquifer recharge areas, and
  - 5. Frequently flooded areas
- B. The jurisdiction of this chapter includes all development that may have adverse impacts on sensitive areas within the city and their buffers.
  - 1. An inventory of designated sensitive areas is maintained by the

City and has been mapped on the Black Diamond Sensitive Areas Maps, as amended or supplemented. Those maps are resources for the identification of the probable location, extent and classification of sensitive areas. Such information may be used by the city administrator and/or his/her designee as a basis for applying the provisions of this code, including requiring field investigation and special reports. In the event of a conflict between information contained in the Sensitive Areas Maps and information relating to the criteria by which Sensitive Areas are defined, including information resulting from a field investigation, the latter shall prevail. Preparation and maintenance of such documents and maps shall not create liability on the part of the City of Black Diamond or any officer or employee thereof for any damages that result from reliance on said maps.

2. Any area within the city meeting the definition of one or more sensitive area, regardless of any formal mapping, identification or delineation, are hereby designated as sensitive areas and are subject to the provisions of this chapter.

#### **19.10.030 Relationship to other Regulations**

- A. These sensitive areas regulations shall apply as an overlay and in addition to zoning and other regulations adopted by the city.
- B. Any sensitive area or buffer subject to another type of sensitive area shall be provided the buffer and meet the requirements that provide the most protection to the sensitive areas involved. When any provision of this chapter or any existing regulation, easement, covenant, or deed restriction conflicts with this chapter, that which provides more protection to the sensitive areas shall apply.
- C. These sensitive areas regulations shall be applied concurrently with review required under other city codes for development and use and the State Environmental Policy Act (SEPA), and any conditions required pursuant to this chapter shall be included in the review of development or use permits, including SEPA review and threshold determination. If no other permits are required, a separate Sensitive Areas Permit is provided for in Section 19.10.120.B.3.

#### **19.10.050 Mitigation**

- A. **Project Action.** Any project action taken pursuant to this chapter shall be mitigated and result in equivalent or greater functions and values of the sensitive areas associated with the proposed action.
- B. **Proposed Action.** The design and development of a proposed action under this chapter must give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fish, such as salmon, and their habitat.

C. **Mitigation sequencing.** All proposed actions and developments shall be designed to avoid, minimize, and/or restore all identified adverse impacts in the following order of preference:

1. Avoiding the impact altogether by not taking a certain action or parts of an action;
2. Minimizing adverse impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps, such as project redesign, relocation, or timing, to avoid or reduce impacts;
3. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment
4. Minimizing or eliminating a hazard by restoring or stabilizing the hazard area through engineered or other methods;
5. Reducing or eliminating the impact or hazard over time by preservation and maintenance operations during the life of the action;
6. Compensating for the impact to by replacing, enhancing, or providing substitute resources or environments; and
7. Monitoring the impact and the required mitigation and taking corrective measures action when necessary.

D. **Restoration and compensation of adverse impacts.** Applicants must first demonstrate an inability to avoid or reduce impacts, before restoration and compensation of adverse impacts will be allowed.

#### **19.10.060 Allowed activities.**

The following activities are allowed under this chapter: The level of review shall be determined by the city administrator and/or his/her designee and shall include (1) existing and compatible activities, (2) emergency actions, (3) activities requiring notification or (4) a full permit review through existing permits or the sensitive area review permit or the exception process. The allowed activities under each review process include:

A. **Existing and Compatible Activities:** The continuation of existing use and activities does not require prior review or approval. Review of expansion of existing use associated with new facilities shall be reviewed in accordance with non-conforming provisions in 19.10.170. Such activities include, but are not limited to:

1. **Operation, maintenance, or repair.** Operation, maintenance, or repair of existing legally established structures, infrastructure improvements, utilities, public or private roads, or drainage systems, that do not require construction permits, if the activity does not modify the character, scope, or size of the original structure or facility or increase the impact to, or encroach further within, the sensitive area or buffer and there is no increased risk to



life or property as a result of the proposed operation, maintenance, or repair. Operation and maintenance includes vegetation management performed in accordance with best management practices that is part of ongoing maintenance of structures, infrastructure, or utilities, provided that such management actions are part of regular and ongoing maintenance, do not expand further into the sensitive area, are not the result of an expansion of the structure or utility, and do not directly impact an endangered or threatened species;

2. **Vegetation Management.** The following vegetation removal activities are allowed using hand labor and light equipment,
  - a. The removal of non-native or noxious and invasive weeds; and
  - b. Maintenance of existing, lawfully established landscaping and gardens within a regulated sensitive area or its buffer, including but not limited to, mowing lawns, weeding, removal of noxious and invasive species, harvesting and replanting of garden crops, pruning and planting of ornamental vegetation or indigenous native species to maintain the condition and appearance of such areas as they existed prior to adoption of this code, provided that native growth protection areas, mitigation sites, or other areas protected via conservation easements or similar restrictive covenants are not covered by this exception.
3. **Outdoor activities.** Recreation, education, and scientific research activities that do not degrade the sensitive area, including such things as fishing, hiking, and bird watching.
4. **Forest Practices.** These practices are governed by a valid Forest Practices Permit granted by the Washington State Department of Natural Resources, except where:
  - a. The lands have been or are proposed to be converted under a conversion option harvest plan to a use other than commercial forest product production as provided in chapter RCW 76.09.050 and RCW 76.09.240, or
  - b. On lands which have been platted after January 1, 1960, as provided in RCW 76.09.050 and RCW 76.09.240.
5. **Agricultural activities.** Agricultural activities shall be subject to the provisions Chapter 19.12 of the Black Diamond Municipal Code. in effect prior to this amendment until July 1, 2010, pursuant to RCW 36.70A.560.
6. **Boundary markers.** Construction or modification of boundary markers.

- B. **Emergencies.** Those activities necessary to prevent an immediate threat to public health, safety, or welfare, or that pose an immediate risk of damage to public or private property and that require remedial or preventative action in a time frame too short to allow for compliance with the requirements of this chapter may be undertaken without prior notification. The city administrator and/or his/her designee shall be provided notification of action taken within two working days after work is initiated, except for city-wide or regional disasters. Mitigation for alteration of sensitive areas may be required and may require subsequent preparation of a sensitive areas report and appropriate permits for restoration. in accordance with the review procedures contained herein. Restoration and/or mitigation activities must be initiated within ninety (90) days of the date of the emergency, and completed in a timely manner;
- C. **Actions Subject to Notification and Approval.** The following actions that can be planned and programmed in advance require written notification to the city administrator and/or his/her designee. If the administrator does not respond within ten (10) days of notification, the activity is deemed approved. The notification must be in a format specified by the administrator to provide specific information describing the activity and the Best Management Practices proposed to minimize impacts on sensitive areas, as well as mitigation proposed. The administrator may deny or impose conditions on proposed activities, or specify that an alternative review process is required. Such activities include:
1. **Minor site investigative work.** Work necessary for land use submittals, such as surveys, soil logs, percolation tests, and other related activities, where such activities do not require construction of new roads or displacement of more than 5 cubic yards of material. Investigations involving displacement of more than 5 cubic yards of material, including geotechnical soil borings, groundwater monitoring wells, percolation tests, and similar activities shall require submittal of specific plans and restoration plans. . In every case, impacts to the sensitive area shall be minimized and disturbed areas shall be immediately restored; and
  2. **Minor utility projects.** Utility projects that have minor or short-duration impacts to sensitive areas, as determined by the city administrator and/or his/her designee in accordance with the criteria below, and which do not significantly impact the function or values of the sensitive area(s); provided, that such projects are constructed with best management practices and additional restoration measures are implemented. Minor activities shall not result in the transport of sediment or increased stormwater. Such allowed minor utility projects shall meet the following criteria:
    - a. There is no practical alternative to the proposed activity with

- less impact on sensitive areas;
- b. The activity involves the placement of a utility pole, street signs, anchor, or vault or other small component of a utility facility; and
  - c. The activity involves disturbance of an area less than 75 square feet.
3. **Activities within the improved right-of-way:** Replacement, modification, installation, or construction of new utility facilities, lines, pipes, mains, equipment, or appurtenances, not including substations, when such facilities are located within the improved portion of the public right-of-way or a city authorized private roadway (road surface, shoulder, sidewalks, and fill slopes not characterized by re-establishment of trees in excess of 4 inches in diameter); except, those activities that alter a wetland or watercourse, such as culverts or bridges, or result in the transport of sediment or increased stormwater. All activities are subject to the following:
- a. Sensitive area and/or buffer widths shall be increased, where possible, equal to the area of disturbance; and,
  - b. Retention and replanting of native vegetation shall occur wherever possible along the right-of-way improvement and resulting disturbance
4. **Hazardous Tree Removal** The removal of trees from sensitive areas and buffers that are hazardous, posing a threat to public safety, or posing an imminent risk of damage to private property can be conducted in accordance with the BDMC 19.30. provided that:
- a. All vegetation cut (tree stems, branches, etc.) shall be left within the sensitive area or buffer unless removal is warranted due to the potential for disease or pest transmittal to other healthy vegetation or due to the potential for a public safety hazard;
  - b. The landowner shall replace any trees that are removed with new trees in accordance with an approved restoration plan within at a ratio that will lead to re-establishment of ecological functions of water cycle, erosion control, shade and habitat. Replacement plantings generally will consist of replanting of the area within the drip line of the removed tree and include either one gallon containers at a minimum triangular spacing of 5 feet, five gallon containers at a minimum triangular spacing of 8 feet, or at a minimum a ratio of two replacement trees for each tree removed (2:1) of

trees a minimum of one (1) inch in diameter-at-breast height (dbh) for deciduous trees and a minimum of six (6) feet in height for evergreen trees as measured from the top of the root ball. Restoration plantings must be installed within the next feasible growing season and in no case more than one (1) year from removal. A performance security may be required to assure implementation. Replacement trees shall be species that are native and indigenous to the site;

- c. If a tree to be removed provides sensitive habitat, such as an eagle perch, a qualified wildlife biologist shall be consulted to determine timing and methods of removal that will minimize impacts. Compliance with state and federal requirements may be required, and;
  5. Removal of vegetation or woody debris from a wildlife conservation area or wetland due to the potential for disease or pest transmittal to other healthy vegetation or due to the potential for a fire or other public safety hazard, or as a necessary part of an approved alteration;
  6. Measures to control a fire or halt the spread of disease or damaging insects consistent with the state Forest Practices Act, Chapter 76.09 RCW, provided that the removed vegetation shall be replaced in-kind or with similar native species within one (1) year in accordance with an approved restoration plan.
  7. Activities undertaken to comply with a United States Environmental Protection Agency superfund related order, or a Washington Department of Ecology order pursuant to the Model Toxics Control Act that specifically preempts local regulations in the findings of the order. Provided that an action that requires compliance with the purpose and intent of local regulations may require a submittal of sensitive area reports and may be processed as a sensitive areas permit.
  8. Activities and facilities for restoration and enhancement of ecological functions of sensitive areas and related resources upon approval of a restoration and mitigation plan by all other relevant agencies in accordance with a watershed restoration project pursuant to RCW 89.08.460, a Salmonid Recovery Plan, or Salmon Recovery Board Habitat Project List, or identified by the Washington Department of Fish and Wildlife as essential for fish and wildlife habitat enhancement pursuant to RCW 77.55.290.
- D. All actions that do not meet the criteria above must be approved in accordance with sensitive areas review integrated with other required permits or by a sensitive areas permit.

**19.10.080 Exceptions**

- A. **Essential public facility.** If the application of this chapter would prohibit a development proposal by a public agency or public utility that is essential to providing a public service, or if the application of this chapter would deny all reasonable economic use of the subject property by the property owner, then the agency or utility or property owner may apply for an exception pursuant to this Section.
- B. **Exception request and review process.** An application for a public agency, public utility or reasonable use exception shall be made to the city and shall include a sensitive area identification form; sensitive area report, including mitigation plan, if necessary; and any other related project documents, such as permit applications to other agencies, special studies, and environmental documents. The city administrator and/or his/her designee shall prepare a recommendation to the Hearing Examiner, except for the provisions for a non-conforming single family lot as provided in Subsection E. below, based on review of the submitted information, a site inspection, and the proposal's ability to comply with the applicable public agency and utility exception review criteria in Subsection (D) below.
- C. **Hearing Examiner review.** The Hearing Examiner shall review the application, except for the provisions for a non-conforming single family lot as provided in Subsection E. below, consider the recommendation of the city administrator and/or his/her designee, and consider public testimony at a public hearing. The Hearing Examiner shall approve, approve with conditions, or deny the request based on the proposal's ability to comply with all of the applicable exception criteria in Subsection (D).
- D. **Exception review criteria.** The criteria for review and approval of a requested exception are as follows:
  - 1. Public agencies and public utilities exception:
    - a. There is no other practical alternative to the proposed development with less impact on the sensitive areas;
    - b. The application of this chapter would unreasonably restrict the ability to provide utility services to the public;
    - c. The proposal does not pose an unreasonable threat to the public health, safety, or welfare on or off the development proposal site;
    - d. The proposal attempts to protect and mitigate adverse impacts to the sensitive area functions and values; and
    - e. The proposal is consistent with other applicable regulations and standards.
  - 2. Private property reasonable use exception:

- a. The application of this chapter would deny all reasonable economic use of the property;
  - b. No other reasonable economic use of the property has less impact on the sensitive area;
  - c. The proposed impact to the sensitive area is the minimum necessary to allow for reasonable economic use of the property;
  - d. The inability of the applicant to derive reasonable economic use of the property is not the result of actions by the applicant after the effective date of this chapter, or its predecessor;
  - e. The proposal does not pose an unreasonable threat to the public health, safety, or welfare on or off the development proposal site;
  - f. The proposal will result in no net loss of sensitive area functions and values; and
  - g. The proposal is consistent with other applicable regulations and standards.
3. Reasonable Use Exception for Non-Conforming Single Family Lots
- a. A reasonable use exception may be approved administratively by the city administrator and/or his/her designee for non-conforming single family residential lots within a subdivision filed within five years previous to the adoption of provisions of this code that render them non-conforming in compliance with RCW 58.17.17, or other lots or parcels under contiguous ownership and less than 20,000 square feet in size that are not subject to landslide hazard areas and associated buffers, shall be subject to the following standards, in conformance with the provisions for a reasonable use exception in subsection (D)(2) (c) through (g) and in accordance with the following criteria:
  - b. Non-conforming lots with an area of 2,000 square feet or more available for a building area unrestricted by sensitive areas or buffers shall comply with the standards of this chapter. The building area means the entire area that will be disturbed to construct a structure containing an allowed use and normal appurtenances, including parking and landscaping.
  - c. Non-conforming lots that do not meet the requirement of subsection b. above shall provide the maximum setback and buffer dimension feasible while providing for a building envelope of at least 2,000 square feet on the lot. The building area shall generally be located on the portion of the lot farthest

from the required sensitive area or buffer and/or the least sensitive portion of the lot.

- d. The area between the structure and the sensitive area shall be maintained or planted in native trees and understory vegetation.
- e. The city administrator and/or his/her designee shall approve, approve with conditions, or deny the request based on the proposal's ability to comply with all of the applicable exception criteria in Subsection (D)(2)(c) through (g).

#### **19.10.100 Sensitive Area Determination and Reports**

BMC 19.10.100 through BMC 19.10.140 pertain to sensitive areas determination and reports.

#### **19.10.110 Sensitive Area Pre-Application Meeting**

Any person preparing to submit an application for development or use of land that may be regulated by the provisions of this chapter is encouraged to conduct a consultation meeting with the city administrator and/or his/her designee prior to submitting an application for development or other approval. At this meeting, the administrator shall discuss the requirements of this chapter; provide sensitive area maps, scientific information, and other source materials maintained by the city; outline the review process; and work with the applicant to identify any potential concerns that might arise during the review process, as well as discussing the need for other permit approvals and their procedures.

#### **19.10.120 Sensitive Area Permit Review**

- A. **Integration with Other Permits.** The approval or denial of an activity or modification within a sensitive area shall be integrated with the review required by any other permit. The decision shall be made by the decision-maker prescribed by the underlying permit, provided that the city administrator and/or his/her designee shall prepare a written analysis that may be in checklist form, for compliance with sensitive area standards and criteria. The review process will be integrated with the review of the underlying permit. Public notice is required only if required by the underlying permit.
- B. **Separate Permit Review.** If no other permit or approval is required, or for approval of allowed uses listed in Section 19.10.060, or for review of sensitive areas jurisdiction as provided in C.1 below, the city administrator or his/her designee may approve a separate sensitive areas permit. Submittal requirements may be modified to address the specific proposal. Fees shall be in accordance with the city fee schedule. Review shall be administrative. If variation in standards for any sensitive area is proposed, public notice shall be provide as provided for a variance in the zoning code. Sensitive area reviews include:
  - 1. **Emergencies.** Notification of emergency actions taken where there

is imminent danger to persons of property requiring that action must take place within 48 hours do not require prior approval. Such notification shall describe work performed and sensitive areas and buffers disturbed. The city administrator and/or his/her designee may:

- a. Administratively approve the emergency action taken with no further action required;
- b. Administratively approve restoration activities that do not require other permits or approvals. A sensitive areas report and/or mitigation plan may be required.
- c. Direct the applicant to apply for other required permits or approvals for required restoration activities.

2. **Actions Subject to Notification and Approval.** Actions that can be planned and programmed in advance, including repair or replacement of utility facilities that do not require other permits or approval shall be subject to notification and administrative review. The city administrator and/or his/her designee shall specify requirements for submittal requirements to address information required on the presence of sensitive areas, description of the activity proposed, and description of the BMPs proposed. The administrator may approve said work and impose conditions upon finding that no substantive impact on sensitive area functions and values will occur. Notification shall be submitted at least ten (10) full business days prior to initiating work. Approvals may be granted for up to one year per activity provided that there is no change in the scope of the project including, but not limited to, the location and/or extent of the activity allowed under the notification process.

3. **Sensitive Area Permit.** Projects that may have substantial impacts on sensitive area functions, but do not require other permits may be reviewed by the city administrator and/or his/her designee as a sensitive area permit subject to all submittal and review criteria and standards of this section. Jurisdiction determinations can be made for projects requiring other permits or approvals, however review of the proposal must take place in conjunction with other review required

C. **Sensitive Areas Jurisdiction Decision.** At the time of, or prior to the city's consideration of any proposed activity, the applicant shall submit to the department a complete sensitive area determination form provided by the city.

1. **Review.** Upon receipt of a project application and a sensitive area determination form, the city administrator and/or his/her designee



shall review available sensitive area maps and data and conduct a site inspection to review sensitive area conditions on site if needed. The administrator and/or his designee make a determination as to whether any sensitive areas may be affected by the proposal and if a sensitive areas report will be required based on the following indicators:

- a. Indication of a sensitive area on the city sensitive areas maps that may be impacted by the proposed activity;
- b. Information and scientific opinions from appropriate agencies, including but not limited to the departments of Fish and Wildlife, Natural Resources, and Ecology;
- c. Documentation, from a scientific or other reasonable source, of the possible presence of a sensitive area; or
- d. A finding by a qualified professional or a reasonable belief by the city administrator and/or his/her designee that a sensitive area may exist on or adjacent to the site of the proposed activity.

2. **Determination decisions.**

- a. No sensitive areas present. If, after a site visit, the analysis by the city administrator and/or his/her designee indicates that the project area is not within or adjacent to a sensitive area or buffer and that the proposed activity is unlikely to degrade the functions or values of a sensitive area, then the city administrator and/or his designee shall rule that the sensitive area review is complete and note on the determination form the reasons that no further review is required. A summary of this information shall be included in any staff report or decision on the underlying permit.
- b. Sensitive areas present, but no impact – report waiver. If the city administrator and/or his/her designee determines that there are sensitive areas within or adjacent to the project area, but that the proposed activity is outside of required buffer areas and is unlikely to degrade the functions or values of the sensitive area, the administrator may waive the requirement for a sensitive area report. A summary of this analysis and the findings shall be included in any staff report or decision on the underlying permit. A waiver may be granted if there is substantial evidence that all of the following requirements will be met:
  - i. The boundaries and classification of the sensitive area and associated buffers can be reliably determined without a technical study, and there will be no

- alteration of the sensitive area or buffer;
- ii. The development proposal will not adversely impact the sensitive area in a manner contrary to the purpose, intent, and requirements of this chapter; and
- iii. The proposal is consistent with other applicable regulations and standards.
- c. **Sensitive areas may be affected by proposal.** If the city administrator and/or his/her designee determines that a sensitive area or areas may be adversely affected by the proposal, then the administrator shall notify the applicant that a sensitive areas report must be submitted prior to further review of the project, and indicate each of the sensitive area types that should be addressed in the report.

#### **19.10.130 Sensitive Area Reports**

- A. **Preparation by qualified professional.** Sensitive area reports shall be prepared by a qualified professional(s) having expertise in the specific sensitive area category(s) that are the subject of the report.
- B. **Use of existing documents.** Unless otherwise provided and as approved by the city administrator and/or his designee, a sensitive area report may be supplemented by or composed, in whole or in part, of any reports or studies required under other laws and regulations or previously prepared for and applicable to the development proposal site.
- C. **Modifications to report requirements.**
  - 1. **Limitations to study area.** The required geographic area of the sensitive area report may be limited as appropriate if:
    - a. The applicant, with assistance from the city, cannot obtain permission to access properties adjacent to the project area; or
    - b. The proposed activity will affect only a limited part of the subject site.
  - 2. **Modifications to required contents.** The applicant may consult with the city administrator and/or his/her designee prior to or during preparation of the sensitive area report to obtain city approval of modifications to the required contents of the report where, in the judgment of a qualified professional, more or less information is required to adequately address the potential adverse impacts and required mitigation.
  - 3. **Additional information requirements.** The city administrator and/or his/her designee may require additional information to be included in the sensitive area report if necessary for the city to

adequately review the proposed activity in accordance with this chapter.

**D. Minimum report contents.** At a minimum, the report shall contain the following information:

1. The name and contact information of the applicant, a description of the proposal, and identification of the permit requested;
2. A copy of the site plan for the development proposal including:
  - a. A map to scale depicting sensitive areas and buffers, and any areas to be cleared;
  - b. Extent of the project area for the proposed activity;
  - c. Topographic elevations at two (2) foot intervals for the sensitive area and its buffer, and at five (5) foot intervals for the remainder of the project site;
  - d. Location of existing and proposed structures, and areas for storage of materials;
  - e. A description of the proposed stormwater management plan and facilities for the development and consideration of adverse impacts to drainage alterations.
3. The dates, names, and qualifications of the persons preparing the report and documentation of any fieldwork performed on the site;
4. Identification and characterization of all sensitive areas and buffers, water bodies, and floodplains within 300 feet of the proposed project area;
5. Detailed description of vegetation in and adjacent to the project area and its associated buffer;
6. A statement documenting sources of best available science and all assumptions made and relied upon;
7. A description of reasonable efforts made to apply mitigation in the order of preference as stipulated in Section 19.10.050;
8. If required, plans for adequate mitigation to offset any adverse impacts, in accordance with 19.10.140, and including, but not limited to:
  - a. The adverse impacts of any proposed development within or adjacent to a sensitive area or buffer on the sensitive area; and
  - b. The adverse impacts of any proposed alteration of a sensitive area or buffer on the development proposal, other properties and the environment.
9. A discussion of the performance standards applicable to the

sensitive area and proposed activity; and

10. Proposed financial guarantees to ensure compliance.
- E. Additional information requirements for specific sensitive areas. In addition to the report requirements listed above in Section 19.10.130(D), the minimum information specific to each sensitive area category shall also be required.

#### **19.10.140 Mitigation Plans.**

- A. **Requirements.** When mitigation is required, the applicant shall submit for approval by city a mitigation plan as part of the sensitive area report. The mitigation plan shall include:
  1. A description of the anticipated adverse impacts to the sensitive areas and the mitigating actions proposed and the purposes of the compensation measures (if applicable), including the site selection criteria; identification of compensation goals; identification of resource functions; and dates for beginning and completion of site compensation construction activities. The goals and objectives shall be related to the functions and values of the impacted sensitive area;
  2. A review of the best available science supporting the proposed mitigation; and
  3. An analysis of the likelihood of success of the mitigation or compensation project.
  4. Specific more detailed information requirements and criteria are provided below for each sensitive area.
- B. **Plan criteria.** The mitigation plan shall include measurable specific criteria for evaluating whether or not the goals and objectives of the mitigation project have been successfully attained and whether or not the requirements of this chapter have been met.
- C. **Plan specifications.** The mitigation plan shall include written specifications and descriptions of the mitigation proposed, such as (and if applicable):
  1. The proposed construction sequence, timing, and duration;
  2. Grading and excavation details;
  3. Erosion and sediment control features;
  4. A planting plan specifying plant species, quantities, locations, size, spacing, and density; and
  5. Measures to protect and maintain plants until established.

These written specifications shall be accompanied by detailed site diagrams, scaled cross-sectional drawings, topographic maps showing slope percentage and final grade elevations, and any other drawings

appropriate to show construction techniques or anticipated final outcome.

- D. **Monitoring program.** The mitigation plan shall include a program for monitoring construction of the proposed mitigation or compensation project and for assessing the completed project. A protocol shall be included outlining the schedule for site monitoring (for example, monitoring shall occur in years 1, 3, 5, and 7 after site construction), and how the monitoring data will be evaluated to determine if the performance standards are being met. A monitoring report shall be submitted as needed to document milestones, successes, problems, and contingency actions of the project. The project shall be monitored for a period necessary to establish that performance standards have been met, but not for a period less than three (3) years. Specific more detailed information requirements and criteria are provided below for each sensitive area.
- E. **Contingencies.** The mitigation plan shall include identification of potential courses of action, and any corrective measures to be taken if monitoring or evaluation indicates project performance standards are not being met.
- F. **Financial guarantees.** The mitigation plan shall include proposed financial guarantees, if necessary, to ensure that the mitigation plan is fully implemented. Financial guarantees ensuring fulfillment of the compensation project, monitoring program, and any contingency measures shall be posted with the city at the time of the first grading, clearing, or construction permit in the amount as provided below
1. **Performance Surety.** The applicant shall post a cash performance bond, letter of credit, or other security acceptable to the city in the amount of one hundred and twenty five percent (125%) of the estimated cost of the uncompleted actions or the estimated cost of restoring the functions and values of the sensitive area that are at risk, whichever is greater. The surety shall be based on an itemized cost estimate of the mitigation activity including clearing and grading, plant materials, plant installation, irrigation, weed management, monitoring, and other costs. The conditions of the surety shall be consistent with the purposes of this chapter and the conditions to be fulfilled. In the event of a breach of any condition of any such bond, the city may institute an action in a court of competent jurisdiction upon such bond and prosecute the same to judgment and execution. The city shall release the bond upon determining that:
    - a. All activities, including any required compensatory mitigation, have been completed in compliance with the terms and conditions of the permit and the requirements of this chapter;
    - b. Upon the posting by the applicant of a maintenance surety.

2. **Maintenance Surety.** The city shall require the holder of a development permit issued pursuant to this chapter to post a cash performance bond, letter of credit, or other security acceptable to the city in an amount and with surety and conditions sufficient to guarantee that structures, improvements and mitigation required by the permit of by this Chapter perform satisfactorily, generally for a period of five (5) years after they have been completed. The city shall release the maintenance bond upon determining that performance standards established for evaluating the effectiveness and success of the structures, improvements and/or compensatory mitigation have been satisfactorily met for the required period. For compensation projects, the performance standards shall be those contained in the mitigation plan developed and approved during the permit review process. The maintenance bond applicable to a compensation project shall not be released until the city determines that performance standards established for evaluating the effect and success of the project have been met. The city administrator and/or his/her designee may return up to 25% of the surety following the first year of monitoring provided that the year 1 performance standards are met and the risk of subsequent failure is considered low.
3. Depletion, failure, or collection of surety funds shall not discharge the obligation of an applicant or violator to complete required mitigation, maintenance, or monitoring.
4. Public development proposals may be relieved from having to comply with the surety requirements of this section if public funds have been committed through a budget process with final approval for mitigation, maintenance, or monitoring.

G. **Mitigation Banking.** The City may approve mitigation banking as a form of compensatory mitigation for wetlands and fish and wildlife habitat conservation area impacts when the provisions of this chapter require mitigation and when it is clearly demonstrated that the use of a mitigation bank will provide equivalent or greater replacement of sensitive area functions and values when compared to conventional on-site mitigation, provided that all of the following criteria are met:

1. Mitigation banks shall only be used when they provide significant ecological benefits including long-term conservation of sensitive areas, important species, habitats and/or habitat linkages, and when they are consistent with the City's Comprehensive Plan and create a viable alternative to the piecemeal mitigation for individual project impacts to achieve ecosystem-based conservation goals.
2. The mitigation bank shall be established in accordance with the Washington State Draft Mitigation Banking Rule WAC 173-700 or as revised, and RCW 90.84 and the federal mitigation banking

guidelines as outlined in the Federal Register Volume 60. No 228, November 28, 1995. These guidelines establish the procedural and technical criteria that banks must meet to obtain state and federal certification.

3. Preference shall be given to mitigation banks that implement restoration actions that have been identified in an adopted Shoreline Restoration Plan, watershed planning document prepared and adopted pursuant to RCW 90.82, a Salmonid Recovery Plan or project that has been identified on the Salmon Recovery Board Habitat Project List or by the Washington Department of Fish and Wildlife as essential for fish and wildlife habitat enhancement.
4. Mitigation banks shall not be used for mitigation of impacts to wetlands and wildlife habitat areas within the Lake Sawyer watershed except in cases where the city administrator and/or his/her designee determine that mitigation is not feasible within the Lake Sawyer watershed.

#### **19.10.150 Notice on Title**

- A. **Recording of restriction.** The owner of any property containing sensitive areas on which a development proposal is approved shall file with the city administrator and/or his/her designee and provide a copy of the filed notice to the city, unless notice is provided on a plat as provided in B, below. The notice shall:
  1. State the presence of the sensitive area and/or buffer area on the property, and identify that there are limitations and restrictions on uses and actions in or affecting the sensitive area and/or buffer imposed by this code and by the provisions of the sensitive areas code and specific conditions of approval. The notice shall indicate that the restrictions run with the land and may be altered only in conjunction with amendment of this chapter or amendment of specific conditions of approval as provided by this chapter.
  2. Provide that management of the sensitive area is required to include, but is not limited to, maintenance or replacement of vegetation to assure the long-term viability of a community of native vegetation, control of invasive plant control, and fulfillment of other conditions of approval.
  3. Provide for the right of the public, and specifically the City of Black Diamond, to enforce the terms of the restrictions through civil infraction or other legal address.
  4. If a site plan has been approved indicating the extent of the sensitive area and buffer and permit conditions, a copy of the site plan together with relevant survey information and permit conditions shall be included in the notice filed.

B. **Plats and Short Plats.** Restrictions on use and development of sensitive areas buffers and setback areas on plats and short plats shall include the information in A, above, shall designate the party responsible for maintenance of the sensitive area, if other than the property owner, and shall place sensitive areas in tracts or easements as provided below:

1. Designation of separate tracts for sensitive areas and buffers shall be the preferred method of designation and protection of sensitive areas in plats to provide for integrated management of the sensitive area and buffer separately from lots. The tract may be:
  - a. Held in an undivided interest by each owner of a building lot within the development, the ownership of which shall pass with the ownership of the lot. Responsibility for meeting all requirements of preservation and management shall be designated to an incorporated homeowner's association or other legal entity that assures the ownership and protection of the sensitive area.
  - b. Dedicated to the City of Black Diamond or other governmental entity qualified to own and manage open space.
  - c. Conveyed to a non-profit land trust, provided the land may not be thereafter transferred to a private party, and provided that if the land trust is dissolved or otherwise fails to perform its functions, ownership and responsibility for management shall devolve to an undivided interest by each owner of a building lot within the development, as provided in a., above.
2. The city administrator and/or his/her designee may allow a sensitive area and buffer to be placed within a protective easement on a parcel with the responsibility for meeting all requirements of preservation and management placed on the owner of the parcel over which the easement is placed. This means of designation shall be used in cases where the size and the ecological functions of the sensitive area do not require coordinated management or where formation of an incorporated homeowner's association or other legal entity for management is found to be impractical because of the limited number of lots, or where ownership and management by the City, a qualified special district or a land trust is found to be impractical. This alternative generally will be limited to sensitive areas and buffers of less than 20,000 square feet and developments of fewer than ten (10) parcels, or non-residential or multi-family development.

C. This notice on title shall not be required for a development proposal by a public agency or public or private utility within a right-of-way or easement for which they do not have fee-simple title.



- D. The applicant shall submit proof that the notice, dedication or easement has been filed for public record before the City shall approve any final plat or final site plan for such site. The notice shall run with the land and failure to provide such notice to any purchaser prior to transferring any interest in the property shall be a violation of this section.

**19.10.160 Building Setbacks**

- A. Buildings and other structures shall be set back a sufficient distance to assure that disturbance to sensitive area vegetation and soils is avoided during construction, maintenance and use.
- B. Buildings and other structures shall be set back a distance of ten (10) feet from the edges of all sensitive area buffers or from the edges of all sensitive areas if no buffers are required, provided that the city administrator and/or his/her designee may modify the building setback based on specific development plans that document that construction techniques, maintenance needs and use will not disturb sensitive areas or buffer.
- C. If slopes adjacent to the buffer for wetlands or water bodies exceed 15 percent, including slopes created by grading, a swale sufficient to intercept surface water movement shall be installed outside the edge of the buffer.
- D. The following facilities and uses are allowed in the building setback:
  - 1. Landscaping, including rockeries not over 42 inches high provided construction does not alter the buffer or sensitive area;
  - 2. Uncovered decks, platforms, porches and similar projections not over 42 inches high;
  - 3. Building eaves, cornices, chimneys and similar projections;
  - 4. Impervious surfaces such as driveways, parking lots, roads, and patios provided that such surfaces conform to applicable water quality standards and that construction equipment does not enter the buffer or sensitive area;
  - 5. Clearing and grading consisting of not over 42 inches of cut or fill.

**19.10.170 Non-conforming Development**

The following provisions shall apply to lawfully established uses, buildings and/or structures that do not meet the specific standards of this Program.

- A. Nonconforming uses shall be governed in accordance with the provisions of the zoning code or in accordance with the Shoreline Master Program subject to additional provisions in this chapter. Such use may not be altered or expanded except in compliance with standards provided in said codes.
- B. Nonconforming structures, facilities and development damaged by fire or other cause shall be governed in accordance with the provisions of the

zoning code or in accordance with the Shoreline Master Program subject to additional provisions in this chapter.

C. Alteration of existing structures or facilities may require modification to sensitive areas or buffers, in accordance with this section and other provisions of this code.

1. Minor alteration or renovation shall be defined as alteration or renovation of any structure, or associated improvements within a sensitive area or buffer that results in an expansion of floor area of less than 500 square feet, or 10 percent, whichever is less, or the expansion of impervious surface by less than 1,000 square feet, or 10 percent, whichever is less; or remodeling or renovation that is less than 50 percent of the value of the structure or improvements, excluding plumbing, electrical and mechanical systems. Minor alteration may require compliance with specific performance standards of this code.
2. Moderate alteration or renovation shall be defined as the alteration or renovation of any structure, or associated improvements within a sensitive area that results in an expansion of floor area of 500 square feet or more, or more than 10 percent and less than 50 percent, whichever is greater; or the expansion of impervious surface by more than 1,000 square feet, or of more than 10 percent and less than 50 percent, whichever is greater; or remodeling or renovation that is greater than 50 percent and less than 100 percent of the value of the structures or improvements excluding plumbing, electrical and mechanical systems.. Moderate alteration may require compliance with specific performance standards of this code.
3. Substantial reconstruction shall be defined as the alteration or renovation that results in an expansion of floor area of more than 50 percent, or the expansion of impervious surface by more than 50 percent, or remodeling or renovation that exceeds 100 percent of the value of the structures or other improvements, excluding plumbing and mechanical systems. Such substantial reconstruction shall be considered the same as new construction and shall fully comply with the provisions of this code.

D. **Buffer adjustment based on existing lot depth.** The city administrator and/or his/her designee may vary buffer dimensions on existing non-conforming lots under contiguous ownership may to take into consideration the existing depth of lots, measured perpendicular from the boundary of the wetland or stream or other sensitive area. Buffers on such lots may be adjusted up to the following, provided that this shall not apply to a geological hazard area unless all applicable design and other standards are met.

1. Lot depth less than 100 feet – buffers may be adjusted to utilize no

more 40% of lot depth, or as necessary to provide a buildable area outside the buffer no less than 40 feet deep, provided that a minimum buffer is not less than 25 feet or 50% of the distance between an existing primary building and the edge of the wetland or stream or other sensitive area.

2. Lot depth 100 feet to 150 feet – buffers may be adjusted to utilize more than 50% of lot depth or 50% of the distance between an existing primary building and the edge of the wetland or stream or other sensitive area.
3. Lot depth 150 to 200 feet – buffers may be adjusted to utilize no more than 70% of lot depth or 70% of the distance between an existing primary building and the edge of the wetland or stream or other sensitive area.
4. Lot depth 200 feet to 250 feet – buffers may be adjusted to no more than 75% of lot depth or 75% of the distance between an existing primary building and the edge of the wetland or stream or other sensitive area.
4. Lot depth 250 feet to 300 feet – buffers may be adjusted to utilize no more than 75% of lot depth or 75% of the distance between an existing primary building and the edge of the wetland or stream or other sensitive area.
5. All other provisions for design and management of buffer areas and adjacent land shall apply, provided that allowed uses in buffer areas may be restricted to reduce impacts on ecological functions and values.

**19.10.180 Administration**

- A. The city administrator and/or his/her designee shall have the authority to adopt administrative rules as deemed necessary consistent with the provisions of this chapter and that are necessary for the implementation of sensitive area regulations.
- B. The city administrator and/or his/her designee shall have a right to enter upon any property at reasonable times and to make such inspections as are necessary to determine compliance with the provisions of this chapter or the conditions imposed pursuant to this chapter. The City shall make a reasonable effort to locate the owner or persons in charge and notify them of the times and purposes of required entry.
- C. The city administrator and/or his/her designee is further authorized to take such actions as may be necessary to enforce the provisions of this chapter including but not limited to the civil infraction, abatement and criminal penalties provided in Black Diamond Municipal Code.
- D. The city's enactment or enforcement of this chapter shall not be construed

for the benefit of any individual person or group of persons other than the general public.

**19.10.190 Appeals**

- A. An aggrieved party may appeal a decision of the city granting or denying a permit that is subject to the appeal process provided for the underlying permit.
- B. For a sensitive areas permit where no other permit is provided, an appeal may be filed pursuant to the provisions for administrative appeal in the zoning code.

**19.10.200 Wetlands**

BMC 19.10.205 to BMC 19.10/.240 pertain to wetlands.

**19.10.210 Designation, rating, and mapping wetlands**

Wetlands in Black Diamond are designated and classified in accordance with the following provisions:

- A. **Designating wetlands.** Wetlands are those areas designated in accordance with the requirements of RCW 36.70A.175 and 90.58.380 and the *Washington State Wetland Identification and Delineation Manual (1997)*. All areas meeting the criteria in manual regardless of mapping or other identification are designated sensitive areas and are subject to the provisions of this chapter.
- B. Wetlands shall be rated based on categories that reflect the functions and values of each wetland.
  - 1. **Core Wetland and Stream Complex.** The wetland complex associated with Rock Creek, Jones Lake, Jones Creek, Black Diamond Lake, Black Diamond Creek, and Ravensdale Creek are designated as the Core Stream and Wetland Complex. The general boundaries of the area affected is designated on Attachment A, provided that the dimensions of the area shall be defined by the field verified wetland boundaries and the buffers defined in Section 19.10.230.
  - 2. **Headwaters Wetlands.** The wetland complex associated with the headwaters of Ginder Creek, Lawson Creek and Ravensdale Creek are defined as headwaters wetlands. The general boundaries of the area affected is designated on Attachment B, provided that the dimensions of the area shall be defined by the field verified wetland boundaries and the buffers defined in Section 19.10.230.
  - 3. **Other Wetlands:** All other wetlands are rated according the following categories based on the criteria provided in the Washington State Wetland Rating System for Western

Washington, revised August 2004 (Ecology Publication #04-06-025). These categories are generally defined as follows.

- a. Category I Wetlands. Category I wetlands are those wetlands of exceptional value in terms of protecting water quality, storing flood and storm water, and/or providing habitat for wildlife as indicated by a rating system score of 70 points or more. These are wetland communities of infrequent occurrence that often provide documented habitat for sensitive, threatened or endangered species, and/or have other attributes that are very difficult or impossible to replace if altered.
- b. Category II Wetlands. Category II wetlands have significant value based on their function as indicated by a rating system score of between 51 and 69 points. They do not meet the criteria for Category I rating but occur infrequently and have qualities that are difficult to replace if altered.
- c. Category III Wetlands. Category III wetlands have important resource value as indicated by a rating system score of between 30 and 50 points.
- d. Category IV Wetlands. Category IV wetlands are wetlands of limited resource value as indicated by a rating system score of less than 30 points. They typically have vegetation of similar age and class, lack special habitat features, and/or are isolated or disconnected from other aquatic systems or high quality upland habitats.

C. Wetland rating categories shall not change due to illegal modifications.

D. **Mapping.** The approximate location and extent of identified wetlands are shown on the Black Diamond Sensitive Areas Map(s). These maps are to be used as a guide for the city, project applicants, and/or property owners, and may be continuously updated as mapped wetlands become more specifically delineated and new wetlands (if any) are identified. They are a reference and do not provide a final sensitive area designation.

#### **19.10.220 Uses and activities allowed in wetlands and adjacent lands.**

The activities listed below are allowed in wetlands in addition to those activities listed in, and consistent with, the provisions and activities established in Section 19.10.060, and 19.10.120 Sensitive area permit review

A. Activities and facilities that do not require prior review or approval, provided, that were the city administrator and/or his/her designee determines such activities may result in a loss of functions and values of a wetland or its buffer the provisions of (B) or (C) shall apply. These activities include:

1. Outdoor recreational or educational activities directly related to the cultural, recreational, scientific and educational aspects of the wetland and buffer and that do not remove vegetation or otherwise affect the function of the wetland or buffer (including wildlife management, viewpoints, outdoor scientific or interpretive facilities, and sports fishing) that have a minimal adverse impact may be permitted within a Category II, III, or IV wetlands or their buffers and may be permitted only within the buffer of a Category I wetland the buffer of a wetland in the Core Complex or the buffer of a Headwaters Wetland.
  2. Conservation or preservation of soil, water, vegetation, fish, shellfish, and other wildlife that does not entail changing the structure or functions of the existing wetland.
  3. The harvesting of wild crops 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 may be permitted within a Category II, III, or IV wetlands or their buffers and may be permitted only within the buffer of a Category I wetland the buffer of a wetland in the Core Complex or the buffer of a Headwaters Wetland.
  4. Enhancement of a wetland 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 re-vegetated with native shrubs, and trees at natural densities. Some hand seeding may also be done over the bare areas with native herbs.
- B. Actions that can be planned and programmed in advance requiring notification and review in accordance with Section 19.10.060.B.2.
1. Drilling for utilities under a Category II, III, or IV wetland and buffer provided that the drilling does not interrupt the groundwater connection to the wetland or percolation of surface water down through the soil column. Specific studies by hydrologist are necessary to determine whether the groundwater connection to the wetland or percolation of surface water down through the soil column is disturbed. Staging areas shall be located outside the wetland buffer.
  2. Overhead utility lines may cross a Category II, III, or IV wetland provided that the line spans the wetland with no poles or other supports within the wetland. Poles may be placed in Category II, III, or IV wetland buffers.
  3. Trails may be permitted within a Category II, III, or IV wetlands or

their buffers and may be permitted only within the buffer of a Category I wetland, the buffer of a wetland in the Core Complex or the buffer of a Headwaters Wetland if the following criteria are met:

- a. Trails are limited to buffer areas except for limited area of pile supported trail sections or viewing areas may be placed within Category II, III and IV wetlands for interpretive purposes.
- b. Trails shall not exceed 4 feet in width and shall be surfaced with wood chips, gravel or other pervious material, including boardwalks. ;
- c. The trail or facility is located in the outer fifty percent (50%) of the Category II, III and IV buffer and the outer 25% of the buffer of a Category I wetland, the buffer of a wetland in the Core Complex or the buffer of a Headwaters Wetland, except for limited placement closer to the wetland edge or within a Category II, III and IV wetland for interpretive purposes as provided above;
- c. The trail or facility is constructed and maintained in manner that minimizes disturbance of the wetland or buffer. Trails or facilities within wetlands shall be placed on an elevated structure as an alternative to fill.
- d. Any adverse impacts on wetland functions and values are mitigated in accordance with Section 19.10.240.

C. Uses and activities that shall be reviewed by a full permit process include:

1. Drilling for utilities under a wetland or buffer in the Core Complex, within a Headwaters Wetland or buffer or a Category I wetland or buffer, may be permitted if the following criteria are met:
  - a. There is no reasonable location or route outside the wetland or wetland buffer based on analysis of system needs, available technology and alternative routes. Location within a wetland buffer shall be preferred over a location within a wetlands.
  - b. The drilling does not interrupt the groundwater connection to the wetland or percolation of surface water down through the soil column. Specific studies by hydrologist are necessary to determine whether the groundwater connection to the wetland or percolation of surface water down through the soil column is disturbed.
  - c. Staging areas are located outside the wetland buffer.

- d. Impacts on wetland functions are mitigated in accordance with Section 19.10.240.
2. Overhead utility lines that cross a wetland or buffer in the Core Complex, within a Headwaters Wetland or buffer or a Category I, II, III, or IV wetland or buffer, with no poles or other supports within the wetland
    - a. There is no reasonable location or route outside the wetland or wetland buffer based on analysis of system needs, available technology and alternative routes. Location within a wetland buffer shall be preferred over a location within a wetland.
    - c. Clearing, grading, and excavation activities are limited to the minimum necessary to install the utility line, and the area is restored following utility installation.
    - d. Impacts on wetland functions are mitigated in accordance with Section 19.10.240.
  3. Linear utilities and facilities such as water and sewer lines providing local delivery service, but not including non-linear facilities such as electrical substations, water and sewage pumping stations, water storage tanks, and not including petroleum products pipelines and not including transformers or other facilities containing hazardous substances, may be located in Category II, III, and IV wetlands and their buffers and the buffer of a Category I wetland, the buffer of a wetland in the Core Complex or the buffer of a Headwaters Wetland if the following criteria are met:
    - a. There is no reasonable location or route outside the wetland or wetland buffer based on analysis of system needs, available technology and alternative routes. Location within a wetland buffer shall be preferred over a location within a wetland.
    - b. The utility line is located as far from the wetland edge as possible and in a manner that minimizes disturbance of soils and vegetation.
    - c. Clearing, grading, and excavation activities are limited to the minimum necessary to install the utility line, which may include boring, and the area is restored following utility installation.
    - d. Buried utility lines shall be constructed in a manner that prevents adverse impacts to subsurface drainage. This may include the use of trench plugs or other devices as needed to maintain hydrology.



- e. Impacts on wetland functions are mitigated in accordance with Section 19.10.240.
2. Public and private roadways and railroad facilities, including bridge construction and culvert installation, and access to private property may be permitted in wetlands or their buffers, if the following criteria are met:
- a. There is no reasonable location or route outside the wetland or wetland buffer based on analysis of alternative routes including through the provisions of RCW 8.24. Location within a wetland buffer shall be preferred over a location within a wetland. Location in a Category II, III, and IV wetlands or their buffers shall be preferred over location in a Category I wetland or its buffer, a wetland in the Core Complex or its buffer, or a Headwaters Wetland or its buffer.
  - b. Facilities in the buffer parallel to the wetland edge shall be located as far from the wetland edge as possible.
  - c. Clearing, grading, and excavation activities are limited to the minimum necessary, which may include placement on elevated structures as an alternative to fill, where feasible.
  - d. Disturbance of soils and vegetation shall be minimized;
  - e. Impacts on wetland functions are mitigated in accordance with Section 19.10.240.
3. Storm water conveyance or discharge facilities such as dispersion trenches, level spreaders, and outfalls may be permitted within a Category II, III, or IV wetland buffer and within the outer 25% of a Category I wetland buffer, the buffer of a wetland in the Core Complex, or the buffer of a Headwaters Wetland, basis if the following are met:
- a. Due to topographic or other physical constraints, there are no feasible locations for these facilities to discharge to surface water through existing systems or outside the buffer.
  - b. Locations and designs that infiltrate water shall be preferred for Category I, II, III, or IV wetland buffer over a design that provides for pipelines or surface discharge across the buffer or into the wetland. Only infiltration facilities are allowed within the buffer of a wetland in the Core Complex, or the buffer of a Headwaters Wetland and only when no trees of greater than 4 inches in diameter are disturbed.
  - c. A hydoperiod analysis is conducted and no impact is demonstrated by the study.

- d. The discharge into a Category I, II, III, or IV wetland is located as far from the wetland edge as possible and in a manner that minimizes disturbance of soils and vegetation and avoids long-term rill or channel erosion. Surface water discharge into a wetland in the Core Complex, or a Headwaters Wetland is prohibited unless analysis demonstrates that infiltration is not feasible because of inherent features such as soil type.
  4. On-site sewage disposal system conventional drainfields may be permitted in the outer 25 percent of a Category II, III and IV wetland buffer when accessory to an approved residential structure, if the following conditions are met:
    - a. It is not feasible to connect to a public sanitary sewer system;
    - b. There is no reasonable location outside the wetland buffer based on analysis of conditions within the contiguous property owned by the applicant;
    - c. The facility is located as far from the wetland edge as possible and is designed and constructed in a manner that minimizes disturbance of soils and vegetation, and no trees in excess of 4 inches in diameter are removed or disturbed;
    - d. Clearing, grading, and excavation activities are limited to the minimum necessary and the area is restored following installation.
    - e. A hydoperiod analysis is conducted and no impact is demonstrated by the study.
- D. Development of adjacent land shall minimize adverse effects on the wetland, and shall include the following standards:
1. Subdivision of land shall assure that each lot has sufficient building area outside wetlands and buffers. Lots in subdivisions shall be oriented whenever feasible to provide a rear yard of at least 20 feet between the buffer area and buildings.
  2. Fencing shall be provided at the perimeter of residential development to limit domestic animal entry into wetlands and buffer areas.
  3. Activities that generate noise shall be located as far from the wetland and buffer as feasible. Roads, driveways, and parking lots for other than park and recreation facilities, as well as loading areas, mechanical or ventilating equipment shall be located on sides of buildings away from the wetland, or separated by noise attenuating walls with a barrier density of at least 4.00 lb/ft<sup>2</sup> along the entire loading area and driveway. .

4. Light penetration into buffer areas and wetlands shall be limited by locating areas requiring exterior lighting away from the wetland boundary, or limiting light mounting heights to a maximum 4 of feet within 100 feet of the wetland buffer. Windows that will be lit at night should be minimized on the side of buildings facing Category I, II, III, or IV wetlands and buffers, and shall not be permitted within 100 feet of the edge of the buffer of a wetland in the Core Complex.
5. Management of surface runoff from adjacent land shall minimize adverse effects on wetland ecological functions and shall include:
  - a. Control of surface water peak flow and duration of flow should be maintained at rates typical of native forest cover;
  - b. Low impact development measures shall be incorporated to the maximum extent feasible, including but not limited to:
    - (i) Site design to maximize preservation of existing patterns of overland water flow and of groundwater interflow;
    - (ii) Vehicle and pedestrian circulation systems that minimize alteration of topography and natural hydrologic features and processes through following the natural contours, of the land.
    - (iii) Road location and circulation patterns shall reduce or eliminate stream crossings and encroachment on sensitive areas and their buffers;
    - (iv) Utilities consolidated within roadway and driveway corridors to avoid additional clearing for multiple corridors.
    - (v) Layout of lots and or structures to minimize alteration of existing topography, disturbance to soils and native vegetation,
    - (vi). Runoff should be routed to infiltration systems, to the maximum extent feasible, to provide groundwater interflow recharge to wetlands and/or water bodies and to limit overland flow and erosion.
      - (1) Use of permeable pavement
      - (2) Dispersion of runoff into areas that permit infiltration
      - (3) Engineered facilities designed for bioretention and infiltration ranging from swales to ponds to tree wells to engineered wetlands.
  - d. Surface or piped stormwater should be routed to existing conveyances or to other areas, wherever hydraulic gradients

allow. Where stormwater is routed to wetlands, system design shall assure that erosion and sedimentation will be avoided to the maximum extent feasible.

- e. To prevent channelized flow from lawns and other landscaped areas from entering the buffer, and to prevent washing of fertilizers, herbicides and pesticides into the buffer, if slopes adjacent to the buffer exceed 15%, a 10 foot wide swale to intercept runoff shall be provided at the edge of the buffer or other effective interception facility approved by the city administrator and/or his/her designee.
- f. Adopt and implement an integrated pest management system including limiting use of fertilizers, herbicides and pesticides within 25 feet of the buffer of Category III, or IV wetland, within 50 feet of the buffer of a Category I, II, or Headwaters wetland, and within 100 feet of the buffer of a wetland in the Core Complex.

#### **19.10.230 Wetland Buffers**

- A. **Wetland buffers.** Buffer requirements contained in this section shall apply to all wetlands designated in this chapter and all proposed mitigation sites. Except as otherwise provided for in this chapter, all wetland buffers shall be maintained in an undisturbed or enhanced condition.
- B. Core Wetland Complex buffers shall be a minimum of 225 feet for all wetlands within the core area, provided that
  - 1. The buffer may be extended further than 225 feet:
    - a. If land within and adjacent to the buffer has a slope in excess of thirty percent (30%) the buffer shall extend at least 25 feet beyond the top of the 30% slope, and
    - b. If land within and adjacent to the buffer is designated a landslide hazard, the buffer shall extend at least to the extent of the buffer designated in Section 19.10.410.B.
  - 2. If a Category III or IV wetland is located within the outer 50% of the buffer of a wetland designated as part of the Core Wetland Complex, and does not have a surface hydrologic connection to the core complex, the buffers for that wetland shall be the standard wetland buffer in Subsection D, below.
- B. Headwaters Wetland buffers shall be a minimum of 225 feet for all wetlands.
- C. **Other Wetlands, Standard buffer widths.** The standard buffer widths presume the existence of a relatively intact mature native vegetation community (relative density of 20 or greater) in the buffer zone adequate

to protect the wetland functions and values at the time of the proposed activity. If the vegetation is inadequate, then the buffer width shall be increased or the buffer shall be planted to maintain the standard width. Required standard wetland buffers based on wetland category are as follows:

**Buffer Dimensions for other wetlands**

Wetland Category	Buffer Width (feet) after Transfer
Category IV	50
Category III	80
Category II	150
Category I	180

- C. **Measurement of wetland buffers.** All buffers shall be measured from the wetland boundary as surveyed in the field. The width of the wetland buffer shall be determined according to the wetland category. The required buffer shall be extended to include any adjacent regulated wildlife habitat area, landslide hazard areas and/or erosion hazard areas and required buffers. Buffers shall not be extended across existing human features that functionally and effectively separate the potential buffer from ecological functions of the resource, and shall include hardened surfaces including improved roads or other lawfully established structures or surfaces, or the developed portions of lots, under separate ownership, lying between the habitat area and the subject property, unless restoration of buffer functions on such property is or may reasonably be expected to be the subject of a permit condition or an adopted public plan. The buffer for a wetland created, restored, or enhanced as compensation for approved wetland alterations shall be the same as the buffer required for the category of the created, restored, or enhanced wetland. Only fully vegetated buffers will be considered. Lawns, walkways, driveways and other mowed or paved areas will not be considered buffers
- D. **Vegetation Management.** In order to maintain effective buffer conditions and functions, a vegetation management plan shall be required for all buffer areas, to include:
1. Maintaining adequate cover of native vegetation including trees and understory; if existing tree cover is less than a relative density of 20, planting shall be required consisting of seedlings at a density of 300 stems per acre or the equivalent;
  2. Provide a dense screen of native evergreen trees at the perimeter of the buffer. Clearing of existing second growth forest generally results in trees with little canopy at or near the ground level.

- a. Core Wetland and Stream Complex buffers generally will require interplanting among existing trees within an area of thirty to fifty feet to provide for regeneration of native species and prevent the establishment of invasive species.
  - b. Other wetland buffers will require plantings if existing vegetation is not sufficient to prevent viewing adjacent development from within the buffer or penetration of light and glare into the buffer or to prevent establishment of invasive species.
  - c. Planting specifications generally shall consist of as many rows of the following units as required to accomplish the management objectives:
    - i) Two rows of 3' high stock of native evergreens at a triangular spacing of 15 feet, or
    - ii) Three rows of gallon containers at a triangular spacing of 8 feet.
3. Fencing may be required if needed to block headlights or other sources of light or to provide an immediate effective visual screen or to limit domestic animal intrusion into the buffer, or to prevent the establishment of informal trail networks from uncontrolled use of the buffer, or to protect especially sensitive plant associations..
  4. Provide a plan for control of invasive weeds, and remove existing invasive species;
  5. Provide for a monitoring and maintenance plan for a period of at least five (5) years, except this provision may be waived for single family residential lots.
  6. Vegetation management plans for Category II and IV wetlands may provide for preservation of view corridors from existing single family residences by the placement of new vegetation in a manner that frames views, provided that the same density is maintained and key functions such as shading for temperature attenuation and habitat functions are maintained.
- E. **Increased wetland buffer widths.** The city administrator and/or his/her designee shall require increased buffer widths in accordance with the recommendations of an experienced, qualified professional wetland scientist, and the best available science on a case-by-case basis when a larger buffer is necessary to protect wetland functions and values based on site-specific characteristics. This determination shall be based on one or more of the following criteria:
1. A larger buffer is needed to protect other sensitive areas;
  2. The buffer or adjacent uplands has a slope greater than fifteen

percent (15%) or is susceptible to erosion and standard or proposed erosion-control measures will not prevent adverse impacts to the wetland; or

**F. Wetland buffer width transfer.**

1. The city administrator and/or his/her designee may allow decreased widths with transfer of an equal area of buffer from wetlands not within the Core Wetland Complex and not Headwater Wetlands to the buffers of the Core Wetland Complex in accordance with the table below provided the specific measures in (2) below are incorporated into the buffers and adjacent development.,

<b>Wetland Category</b>	<b>Buffer Width (feet) after Transfer</b>
Category IV	30
Category III	50
Category II	100
Category I	125

2. The following specific mitigation measures shall be incorporated into adjacent development in order to utilize the buffer dimensions specified in (1) above shall be as follows, provided that the city administrator and/or his/her designee may approve alternatives measures that are demonstrated by the applicant to have equivalent effectiveness in reducing impacts on wetland functions:
  - a. A buffer area transferred may not be less than 200 linear feet, except for existing non-conforming lots. Buffer area transfer is preferred within new development as part of an integrated program for management of sensitive areas.
  - b. The slope within the buffer to be reduced and adjacent lands shall not exceed 15%.
  - c. No transfer of buffer area may take place if adjacent land use is commercial, industrial, multi-family in excess of 6 dwelling units per acre, and/or a height of 30 feet, or active recreation activities consisting or sports fields or similar uses.
  - c. All standards for adjacent development in Subsection 19.10.220.D. shall be complied with, and in addition:
    - i. Solid wood or masonry fencing at least six feet in height shall be provided at the perimeter of the buffer to limit noise and light as well as human and domestic animal

- entry into wetlands and buffer areas.
- ii. No mechanical or ventilating equipment shall be located on sides of buildings adjacent to the wetland and buffer.
  - iii. No impervious surfaces, parking areas or vehicular access facilities may be located within 40 feet of the buffer.
  - iv. No discharge of surface water from adjacent development may take place into the resource or buffer. If topography is such that runoff is naturally directed toward the resource or buffer, low impact development features shall be incorporated with a design incorporating infiltration that demonstrates that no surface runoff will be produced. If soils or other conditions are not suitable to meet this standard, the buffer transfer may not be approved.
- d. All standards for vegetation management in Subsection 19.10.230.D. shall be complied with, and in addition:
- i. The buffer area being transferred to must have a relative density of at least 20 and/or enhancement vegetation must be installed, or plans approved and a performance assurance provided in accordance with Subsection 19.10.140.F.
  - i. The buffer area being transferred from must be interplanted to provide a more effective buffer or plans approved and a performance assurance provided in accordance with Subsection 19.10.140.F. Planting must be installed prior to construction upon the adjacent parcel.
- e. The building setback between the buffer of a Category I, II, or III wetland and any structure, as provided in Subsection 19.10.160. B. Building Setbacks shall be no less than 40 feet from the edge of the wetland buffer, and facilities and uses allowed in the building setback in Subsection 19.10.160. D shall be no less than 30 feet from the wetland buffer.
- f. A notice on title or plat or short plat restriction shall be filed in accordance with Section 19.10.150 that shall include a survey of the wetland boundary, the buffer boundary and building setback lines and all conditions of approval.

**G. Wetland buffer width averaging.** The city administrator and/or his/her designee may allow modification of the standard wetland buffer width in accordance with an approved sensitive area report and the best available science on a case-by-case basis by averaging buffer widths. Averaging of buffer widths may only be allowed where a qualified professional wetland



scientist demonstrates that:

1. Averaging to improve wetland protection may be permitted when all of the following conditions are met:
  - a. The wetland contains variations in sensitivity due to existing physical characteristics or the character of the buffer varies in slope, soils, or vegetation, and the wetland would benefit from a wider buffer in places and would not be adversely impacted by a narrower buffer in other places;
  - b. Buffer averaging will not reduce wetland functions or functional performance;
  - c. The total area contained in the buffer area after averaging is no less than that which would be contained within the standard buffer; and all increases in buffer dimension for averaging are generally parallel to the wetland edge;
  - d. The buffer width at its narrowest point is not reduced to less than 75 percent (75%) of the standard width and in no case less than thirty-five (35) feet.
2. Averaging to allow reasonable use of a parcel may be permitted when all of the following criteria are met:
  - a. There are no feasible alternatives to the site design that could be accomplished without buffer averaging;
  - b. The buffer averaging does not reduce the functions or values wetland, or the buffer averaging, in conjunction with vegetation enhancement or other measures increases the wetland function;
  - c. The total area contained in the buffer area after averaging is no less than that which would be contained within the standard buffer and all increases in buffer dimension for averaging are generally parallel to the wetland edge;
  - d. The buffer at its narrowest point is never less than 3/4 of the required width except where the city administrator and/or his/her designee finds that there is an existing feature such as a roadway that limits buffer dimension, or an essential element of a proposed development such as access that must be accommodated for reasonable use and requires a smaller buffer.
3. The width reduction may not be located within another sensitive area or associated buffer unless criteria for averaging said buffer are also addressed and approved.
4. Buffer averaging may not be approved when buffer transfer is

approved in accordance with subsection F, above.

H. **Buffer enhancement for changes to existing uses.** As provided in Sections 19.10.170 and 19.10.350.C, buffer dimensions and enhancement of vegetation communities may be enhanced at the time of redevelopment of improvements on non-conforming lots as provided below:

1. Minor alteration or renovation of existing development
  - a. Vegetate buffer enhancement, either 50% of buffer standard or 50% of existing structure setback from wetland
  - b. Fence and sign buffer area
2. Moderate alteration or renovation of existing development
  - a. Vegetate buffer enhancement, either 70% of buffer standard or 60% of existing structure setback from wetland
  - b. Fence and sign buffer area
3. Substantial redevelopment
  - a. Buffer dimension, 100 percent of standard
  - b. Vegetation enhancement, 100% of standard
  - c. Fence and sign buffer area

**19.10.235 Provisions for Small Isolated Wetlands**

- A. All wetlands shall be regulated regardless of size, provided that the city administrator and/or his/her designee shall assure that preservation of isolated wetlands and associated buffers of less than ten thousand (10,000) square feet of combined wetland and buffer shall maintain effective wetland functions, or be mitigated as provided below.
- B. Wetlands and associated buffers of less than one thousand (1,000) square feet may be displaced when the wetland meets all of the following criteria, as documented in a wetland sensitive area study.
  1. The wetland is not associated with a riparian corridor,
  2. The wetland is not part of a wetland mosaic and
  3. The wetland does not contain habitat identified as essential for local populations of priority species identified by Washington Department of Fish and Wildlife.
  4. Impacts of displaced wetlands are mitigated pursuant to Section 19.10.240.
- C. Category 3 and 4 wetlands between 1,000 and 4,000 square feet may be displaced without meeting the provisions of Section 19.10.240 regarding avoidance, minimization, rectification, and reducing and eliminating the impact over time, provided that the criteria in B, above are met and the wetland does not score 20 points or greater for habitat in the 2004 Western

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- D. Preservation of isolated wetlands with a total area of the combined wetland and buffer of 10,000 square feet or less shall meet the following provisions, or if the said provisions cannot be demonstrated, as specified by the city administrator and/or his/her designee, they may be displaced and shall be mitigated as specified in Section 19.10.240.
1. Depressional wetlands recharged only by precipitation, interflow or groundwater shall be assured a source of recharge to maintain its hydrologic character through stormwater infiltration, or other means.
  2. Wetlands that have a potential to reduce flooding or erosion or has the potential and opportunity to maintain or improve water quality as evidenced by a score of at least 10 points on the applicable criteria of the Wetland Rating Form for Western Washington shall maintain a hydraulic connection to surface water that maintains effective wetland function for flood or erosion reduction or water quality and does not substantially alter the existing hydroperiod of the wetland.
  3. Wetlands that achieve a score of at least 20 points on the Habitat Functions criteria of the Wetland Rating Form for Western Washington shall maintain a connection to a linear corridor maintained as a stream buffer, a buffer associated with a geological hazard or other designated open space buffer sufficient to allow movement of terrestrial wildlife to and from the wetland and buffer complex without interruption by roads, paved areas or buildings within 50 feet.

### 19.10.240 Mitigation Requirements

- A. **Mitigation plan.** A mitigation plan that achieves equivalent or greater biologic functions will be required for all proposed wetland alterations or to mitigate unavoidable adverse impacts to the wetland functions and values resulting from a proposed action. Mitigation plans shall be prepared consistent with the minimum requirements of Section 19.10.140 and Subsection.
- B. **Compensatory mitigation.** As a condition of any permit allowing alteration of a wetland and/or wetland buffer, or as part of an enforcement action, an applicant may be required to provide restoration, creation or enhancement of wetlands and their buffers to offset unavoidable adverse impacts resulting from the applicant's or violator's actions.
1. Compensation areas shall be determined according to the function, acreage, type, location, time factors, ability to be self sustaining and probability of project success.
  2. Where feasible, restored or created wetlands shall be a higher

category than the altered wetland.

3. Compensatory projects shall be completed immediately after the activities that will disturb wetlands and prior to use or occupancy, unless otherwise agreed to within the permit application. Construction of compensatory projects shall be timed to reduce adverse impacts to existing wildlife and flora.

C. Type and location of mitigation.

1. Unless it is demonstrated that a higher level of ecological functioning would result from an alternate approach, compensatory mitigation for ecological functions shall be either in-kind and on-site, or in-kind and within the same stream reach, or sub-basin. Mitigation actions shall be conducted within the same sub-drainage basin and on the same site as the alteration except when the all of the following apply:
  - a. There are no reasonable on-site or in subdrainage basin opportunities or on-site and in-subdrainage basin opportunities do not have a high likelihood of success, after a determination of the natural capacity of the site to mitigate for the impacts. Consideration should include: anticipated wetland mitigation replacement ratios, buffer conditions and proposed widths, hydrogeomorphic classes of on-site wetlands when restored, proposed flood storage capacity, potential to mitigate riparian fish and wildlife.
  - b. Off-site mitigation has a greater likelihood of providing equal or improved wetland functions than the impacted wetland; and
  - c. Off-site locations shall be in the same sub-drainage basin unless established watershed goals for water quality, flood or conveyance, habitat, or other wetland functions have been established and strongly justify location of mitigation at another site.
2. In kind compensation shall be provided where feasible. The applicant may provide out-of-kind compensation provided:
  - a. Out -of-kind replacement will result in a wetland with greater functional value; or
  - b. Scientific problems such as exotic vegetation and changes in watershed hydrology make in-kind compensation impractical.
3. Mitigation actions that require compensation by replacing, enhancing, or substitution shall occur in the following order of preference:

- a. Restoring wetlands on upland sites that were formerly wetlands (also called re-establishment).
- b. Creating wetlands where none previously existed on upland sites. The preferred sites are those that have been disturbed such that vegetative cover consists primarily of non-native introduced species. Creation of wetlands in areas of mature native vegetation should be avoided when the habitat and other values of the site would be lost. Creation on upland sites should only be attempted when there is a consistent source of hydrology and it can be shown that the surface and subsurface hydrologic regime is conducive for the wetland community that is being designed.
- c. Restoration of wetland functions in an existing wetland area that is significantly degraded (also called rehabilitation) This may be done in combination with restoration or creation. Such enhancement should be part of a mitigation package that includes replacing the impacted area meeting appropriate ratio requirements.
- d. Enhancement of some wetland functions in an existing wetland that may reduce other functions

D. **Mitigation ratios.** The following ratios apply to the different categories of compensation:

Wetland Category	Wetland Mitigation Type and Replacement Ratio*			
	Reestablishment	Creation	Re-habilitation	Enhancement Only
Category IV	1.5:1	1.5:1	2:1	3:1
Category III	2:1	2:1	3:1	4:1
Category II	3:1	3:1	4:1	6:1
Category I	6:1	6:1	8:1	Not allowed
Headwaters Wetlands	6:1	6:1	8:1	Not allowed
Core Wetland Complex	6:1	8:1	10:1	Not allowed

\*Ratio is the replacement area: impact area.

1. Buffers shall be provided for wetland compensation sites as provided in Section 19.10.230, provided that the city administrator and/or his/her designee shall have the same authority to modify and average widths.
2. The city administrator and/or his/her designee may increase the replacement ratios to account for uncertainties as to the success of the restoration or creation or the time required for replacement

wetlands to be effective. Such an increase will be based on the review of a sensitive area report prepared by a qualified professional.

3. In the case of off-site compensation the city administrator and/or his/her designee may decrease the replacement ratios based on the review of a sensitive area report prepared by a qualified professional and upon findings reviewed by agencies with expertise that no net loss of wetland function or value is attained under a reduced compensation ratio; which in no case shall be less 75% of the values in the table above for the Core Wetland Complex and 50% of the values in the table above for other wetlands and in no case lower than 1.5:1.
- E. Compensation for wetland buffer impacts shall occur at a minimum 1:1 ratio. Compensatory mitigation for buffer impacts shall include enhancement of buffers by planting native species, removing structures and impervious surfaces within buffers, and other measures in accordance with Subsection 19.10.140.F .
- F. Wetlands enhancement as mitigation: Any applicant proposing to alter a wetland may propose enhancement of existing significantly degraded wetlands. Applicants proposing to enhance wetlands must produce a sensitive area report that identifies how enhancement will increase the functions of the degraded wetland and how this increase will adequately mitigate for the loss of wetland area and function at the impact site.

#### **19.10.250 Wetland Mitigation Plan**

In addition to meeting the requirements of Section 19.10.140, a compensatory mitigation plan for wetland and wetland buffer impacts shall meet the following requirements:

- A. The plan shall be based on applicable portions of the Washington State Department of Ecology's Guidelines for Developing Freshwater Wetland Mitigation Plans and Proposals, 2004 or other appropriate guidance document that is consistent with best available science.
- B. The plan shall contain sufficient information to demonstrate that the proposed activities are logistically feasible, constructible, ecologically sustainable, and likely to succeed. Specific information to be provided in the plan shall include:
  1. The rationale for site selection;
  2. General description and scaled drawings of the activities proposed including, but not limited to, clearing, grading/excavation, drainage alterations, planting, invasive plant management, installation of habitat structures, irrigation, and other site treatments associated with the development activities and proposed mitigation action(s);

3. A description of the ecological functions and values that the proposed alteration will affect and the specific ecological functions and values the proposed mitigation area(s) shall provide, together with a description of required or recommended mitigation ratios and an assessment of factors that may affect the success of the mitigation program;
  4. Overall goals of the plan, including wetland function, value, and acreage;
  5. Description of baseline (existing) site conditions including topography, vegetation, soils, hydrology, habitat features (i.e., snags), surrounding land use, and other pertinent information;
  6. Field data confirming the presence of adequate hydrology (surface and/or groundwater) to support existing and compensatory wetland area(s);
  7. Nature of mitigation activities, including area of restored, created, enhanced and preserved wetland, by wetland type;
  8. Detailed grading and planting plans showing proposed post-construction topography; general hydrologic patterns; spacing and distribution of plant species, size and type of proposed planting stock, watering or irrigation plans, and other pertinent information;
  9. A description of site treatment measures including invasive species removal, use of mulch and fertilizer, placement of erosion and sediment control devices, and best management practices that will be used to protect existing wetlands and desirable vegetation.
  10. A demonstration that the site will have adequate buffers sufficient to protect the wetland functions into perpetuity.
- C. Specific measurable performance standards that the proposed mitigation action(s) shall achieve together with a description of how the mitigation action(s) will be evaluated and monitored to determine if the performance standards are being met and identification of potential courses of action, and any corrective measures to be taken if monitoring or evaluation indicates that project performance standards are not being met. The performance standards shall be tied to and directly related to the mitigation goals and objectives.
- D. Cost estimates for the installation of the mitigation program, monitoring, and potential corrective actions if project performance standards are not being met.

**19.10.260 Wetland Mitigation Monitoring**

- A. All wetland mitigation projects shall be monitored for a period necessary to establish that performance standards have been met, but generally not for a period less than five (5) years. Reports shall be submitted annually for the first three (3) years following construction and at the completion of

years 5, 7, and 10 if applicable to document milestones, successes, problems, and contingency actions of the compensatory mitigation. The city administrator and/or his/her designee shall have the authority to modify or extend the monitoring period and require additional monitoring reports for up to ten (10) years when any of the following conditions apply:

1. The project does not meet the performance standards identified in the mitigation plan.
  2. The project does not provide adequate replacement for the functions and values of the impacted sensitive area.
  3. The project involves establishment of forested plant communities, which require longer time for establishment.
- B. Mitigation monitoring reports shall include information sufficient to document and assess the degree of mitigation success or failure as defined by the performance standards contained in the approved mitigation plan. Information to be provided in annual monitoring reports shall include the following:
1. Number and location of vegetation sample plots used to document compliance with performance standards;
  2. Measurements of the percent survival of planted material, plant cover, stem density, presence of invasive species, or other attributes;
  3. For sites that involve wetland creation, re-establishment or rehabilitation, hydrologic observations of soil saturation/inundation as needed to demonstrate that a site meets the wetland hydrology criterion;
  4. Representative photographs of the site;
  5. A written summary of overall site conditions and recommendations for maintenance actions if needed;
  6. Other information that the city administrator and/or his/her designee deems necessary to ensure the success of the site.

#### **19.10.300 Fish and Wildlife Conservation Areas**

BMC 19.10.300 through BMC 19.10.340 pertain to fish and wildlife conservation areas.

#### **19.10.310 Designation and Mapping**

Fish and wildlife conservation areas in Black Diamond are designated and classified in accordance with the following provisions:

- A. **Core Stream and Wetland Complex.** The streams, lakes, ponds and wetland complex associated with Rock Creek, Jones Lake, Jones Creek, Black Diamond Lake, Black Diamond Creek, and Ravensdale Creek are designated as the Core Stream and Wetland Complex. The general



boundaries of the area affected is designated on Attachment A, provided that the dimensions of the area shall be defined by the field verified stream boundaries and the buffers defined in Section 19.10.325.

B. **Other fish and wildlife conservation areas.** Areas outside of the Core Stream and Wetland Complex include areas within the City which state or federally designated endangered, threatened, and sensitive species have a known primary association, including

1. The Washington State Department of Fish and Wildlife Priority Habitats and Species Recommendations for Species and Habitats, for:
    - a. Endangered species listed at WAC 232-12-014
    - b. Threatened species listed at WAC 232-12-001
    - c. Sensitive species listed at WAC 232-12-011;
  2. Bald Eagle habitat pursuant to WAC 232-12-292
  3. Endangered or threatened species listed in accordance with the federal Endangered Species Act together with the areas with which they have a primary association.
  4. State natural area preserves and natural resource conservation areas including
    - a. Department of Natural Resources (DNR) designated Natural Areas Preserves (NAP) and Natural Resource Conservation Areas (NECA);
    - b. Washington Department of Fish and Wildlife (WDFW) designated Wildlife Recreation Areas (WRA);
  5. Waters of the state as defined in RCW 77.55.011, and RCW 90.56.010 including shorelines of the state as defined in RCW 90.58.010;
  6. Naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or wildlife habitat;
  7. Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity;
- C. Habitats and species of local importance as may be determined by the city.
1. In order to nominate an area or a species to the category of Locally Important an individual or organization must:
    - a. Demonstrate a need for special consideration based on:
      - i. Declining population;
      - ii. High sensitivity to habitat manipulation; or

- iii Demonstrated commercial, recreational, cultural, or other special value;
    - b. Propose relevant management strategies considered effective and within the scope of this Chapter; and
    - c. Provide a map showing the species or habitat location(s).
  - 2. Submitted proposals shall be reviewed by the City and may be forwarded to the State departments of Fish and Wildlife, Natural Resources, and/or other local, State, Federal, and/or Tribal agencies or experts for comments and recommendations regarding accuracy of data and effectiveness of proposed management strategies.
  - 3. If the proposal is found to be complete, accurate, and consistent with the purposes and intent of this chapter, the City Commission will hold a public hearing to solicit comment. Approved nominations will become designated locally important habitats or species and will be subject to the provisions of this chapter.
- D. **Mapping.** The approximate location and extent of known wildlife conservation areas are shown on the sensitive area maps. These maps are a reference and do not provide a final sensitive area designation.

**19.10.320 Classification of fish and wildlife habitat conservation areas – Water bodies**

- A. **Core Stream and Wetland Complex.** The streams, lakes, ponds and wetland complex associated with Rock Creek, Jones Lake, Jones Creek, Black Diamond Lake, Black Diamond Creek, and Ravensdale Creek are designated as the Core Stream and Wetland Complex. The general boundaries of the area affected is designated on Attachment A, provided that the dimensions of the area shall be defined by the field verified stream boundaries and the buffers defined in Section 19.10.325.
- B. **Other fish and wildlife conservation areas.** Streams outside of the Core Stream and Wetland Complex shall be designated in accordance with the Washington State Department of Natural Resources (DNR) stream type as provided in WAC 222-16-030 with the following revisions:
  - 1. Type S Water - all waters, as inventoried as "shorelines of the state" under chapter 90.58 RCW and the rules promulgated pursuant to Chapter 90.58 RCW including periodically inundated areas of their associated wetlands.
  - 2. Type F Water - segments of natural waters other than Type S Waters, which are within defined channels and periodically inundated areas of their associated wetlands or within lakes, ponds, or impoundments having a surface area of 0.5 acre or greater at

seasonal low water and which in any case contain fish habitat.

3. Type Np Water - all segments of natural waters within defined channels that are perennial non-fish habitat streams. Perennial streams are waters that do not go dry any time of a year of normal rainfall. However, for the purpose of water typing, Type Np Waters include the intermittent dry portions of the perennial channel below the uppermost point of perennial flow.
  4. Type Ns Water - all segments of natural waters within defined channels that are not Type S, F, or Np Waters. These are seasonal, non-fish habitat streams in which surface flow is not present for at least some portion of a year of normal rainfall and are not located downstream from any stream reach that is a Type Np Water. Ns Waters must be physically connected by an above-ground channel system to Type S, F, or Np Waters.
- B. Non-fish habitat streams are those streams that have no known or potential use by anadromous or resident fish based on the stream character, hydrology and gradient, provided that human-made barriers shall not be considered a limit on fish use except when the city administrator and/or his/her designee makes the following findings:
1. The human-made barrier is located beneath public infrastructure that is unlikely to be replaced and it is not feasible to remove the barrier without removing the public infrastructure, provided that the infrastructure is not identified for future modification in the capital facility or other plans of the public agency responsible for the infrastructure, and the facility will not exceed its design-life within the foreseeable future;
  2. The human-made barrier is located beneath one or more occupied structures and it is not feasible to remove the barrier without removing the structure, and the structure is of a size and condition that removal or substantial remodel is not likely;
  3. The human-made barrier is not identified for removal by a public agency or in an adopted watershed plan.

#### **19.10.325 Fish and wildlife habitat conservation areas – Water bodies – Buffers**

The city administrator and/or his/her designee shall have the authority to require buffers from the edges of all streams in accordance with the following:

- A. Buffers shall be established for activities adjacent to habitat areas as necessary to protect the integrity, functions and values of the resource. Buffer widths shall reflect the sensitivity of the species or habitat and the type and intensity of the adjacent human use or activity.
- B. **Buffers.** The buffer widths required by this section are based on scientific studies of the conditions necessary to sustain ecological functions and values to support anadromous and resident fish and presume the existence of a dense native

vegetation community in the buffer zone adequate to protect the stream functions and values at the time of the proposed activity. Buffers of undisturbed native vegetation shall be required along all streams as provided below. The buffer shall extend landward from the top of the bank.

B. **Core Stream and Wetland Complex** buffers shall be a minimum of 225 feet for all streams within the core area, provided that the buffer may be extended further if:

1. Land within and adjacent to the buffer has a slope in excess of thirty percent (30%) the buffer shall extend at least 25 feet beyond the top of the 30% slope, and
2. Land within and adjacent to the buffer is designated a landslide hazard, the buffer shall extend at least to the extent of the buffer

C. **Other streams, standard buffer.** All other streams shall be provided the following buffers based on the Department of Natural Resources (DNR) water typing classification system as defined in Section 19.10.320.B.

Type	Buffer Width
Type S- all waters, as inventoried as "shorelines of the state" under the jurisdiction of the Shoreline Management Act, except associated wetlands, which shall be regulated in accordance with this chapter	200 feet
Type F - segments of natural waters other than Type S Waters	150 feet
Type Np - segments of natural waters that are perennial non-fish habitat streams.	100 feet
Type Ns - segments of natural waters within defined channels that are seasonal, non-fish habitat streams	50 feet

B. **Buffer measurement.** The buffer shall be measured landward horizontally on both sides of the water body from the ordinary high water mark as identified in the field perpendicular to the alignment of the stream or lake/pond bank. The required buffer shall be extended to include any adjacent regulated wetland(s), landslide hazard areas and/or erosion hazard areas and required buffers. Buffers shall not be extended across existing human features that functionally and effectively separate the potential buffer from ecological functions of the resource, and shall include hardened surfaces, including improved roads or other lawfully established structures or surfaces, or the developed portions of lots, under separate ownership, lying between the habitat area and the subject property, unless restoration of buffer functions on such property is or may reasonably be expected to be the subject of a permit condition or an adopted public plan.

- C. **Buffers in conjunction with other sensitive areas.** Where other sensitive areas defined in this chapter fall within the water body buffer, the buffer area shall be the most expansive of the buffers applicable to any applicable sensitive area.
- D. **Vegetation management.** In order to maintain effective buffer conditions and functions, a vegetation management plan shall be required for all buffer areas, to include the standards found in Subsection 19.10.230.D:
- E. **Buffer increase.** The city administrator and/or his/her designee shall have the authority to increase the width of a stream buffer on a case-by-case basis when such increase is necessary to achieve any of the following:
  - 1. Protect fish and wildlife habitat, maintain water quality, ensure adequate flow conveyance; provide adequate recruitment for large woody debris, maintain adequate stream temperatures, or maintain in-stream conditions.
  - 2. Compensate for degraded vegetation communities or steep slopes adjacent to the stream.
  - 3. Maintain areas for channel migration.
  - 4. Protect adjacent or downstream areas from erosion, landslides, or other hazards.
- F. **Water body buffer width transfer.**
  - 1. The city administrator and/or his/her designee may allow decreased widths with transfer of an equal area of buffer from water bodies not within the Core Stream and Wetland Complex to the buffers of the Core Stream and Wetland Complex in accordance with the table below provided the specific measures in (2) below are incorporated into the buffers and adjacent development.,

Type	Buffer Width (feet) after Transfer
Type S	150 feet
Type F	100 feet
Type Np	50 feet
Type Ns	30 feet

- 2. The specific mitigation measures in Subsection 19.10.320.F.2 shall be incorporated into adjacent development in order to utilize the buffer dimensions specified in (1) above.
- G. **Habitat buffer averaging.** The city administrator and/or his/her designee may allow the recommended habitat area buffer width to be reduced in accordance when the applicant demonstrates to the satisfaction of the administrator that all the following criteria are met.:

1. Averaging to improve water body habitat protection may be permitted when all of the following conditions are met:
  - a. The water body or buffer area has significant differences in characteristics that affect its habitat functions;
  - b. Buffer averaging will not reduce stream or adjacent upland habitat functions or adversely affect salmonid habitat;
  - c. Buffer averaging is combined with other provisions to provide additional habitat protection, such as buffer vegetation enhancement;
  - d. The total area contained in the buffer area after averaging is no less than that which would be contained within the standard buffer and the buffer is increased adjacent to the higher-functioning area of habitat or more sensitive portion of the water body and decreased adjacent to the lower-functioning or less sensitive portion and all increases in buffer dimension for averaging are generally parallel to the stream OHWM;
  - e. The buffer area width is not reduced by more than twenty-five percent (25%) in any location.
2. Averaging to allow reasonable use of a parcel may be permitted when all of the following criteria are met:
  - a. There are no feasible alternatives to the site design that could be accomplished without buffer averaging;
  - b. The buffer averaging does not reduce the functions or values of the stream or riparian habitat, or the buffer averaging, in conjunction with vegetation enhancement, increases the habitat function;
  - c. The total area contained in the buffer area after averaging is no less than that which would be contained within the standard buffer and all increases in buffer dimension for averaging are generally parallel to the wetland edge;
  - d. The buffer at its narrowest point is never less than 75% of the required width except where the city administrator and/or his/her designee finds that there is an existing feature such as a roadway that limits buffer dimension, or an essential element of a proposed development such as access that must be accommodated for reasonable use and requires a smaller buffer.
3. The buffer width reduction may not be located within another sensitive area or associated buffer unless criteria for averaging said

buffer are also addressed and approved.

4. Buffer averaging may not be approved when buffer transfer is approved in accordance with subsection F, above.
- H. Development of adjacent land shall minimize adverse effects on the habitat area, and shall include the standards in Subsection 19.10.220.D.
- I. **Buffer enhancement for changes to existing non-conforming lots.** As provided in Sections 19.10.170 and 19.10.350.C, buffer dimensions and enhancement of vegetation communities may be enhanced at the time of redevelopment of improvements on non-conforming lots as provided below:
1. Minor Alteration of Existing Development
    - a. Vegetate buffer enhancement, either 50% of buffer standard or 50% of existing shoreline structure setback
    - b. Fence and sign buffer area
  2. Moderate Alteration of Existing Development
    - a. Vegetate buffer enhancement, either 70% of buffer standard or 60% of existing shoreline structure setback
    - b. Fence and sign buffer area
  3. Substantial Redevelopment
    - a. Buffer dimension
    - b. Vegetation enhancement, 100% of standard
    - c. Fence and sign buffer area
    - d. Replace existing bulkheads and docks with conforming structures

**19.10.328 Water bodies – Culvert Replacement**

- A. Culverts on public or private roads that are a barrier to fish movement shall be replaced at the time of major reconstruction, or if additional subdivision increases the number of lots served by the roadway by 20 percent or more. Replacement structures shall meet the standards of 19.10.330.C.2. This provision does not limit potential requirements for replacement under other statutes or treaty rights.
- B. Stream sections not within public or private roads that are culverted or enclosed shall be replaced by an open channel at any time of moderate or substantial reconstruction of uses on the parcel lots are served

**19.10.330 Activities allowed in water bodies and habitat buffers.**

The activities listed below are allowed in water bodies and habitat buffers in addition to those activities listed in, and consistent with, the provisions and activities established in Section 19.10.060, in accordance with the review

provisions below.

- A. Activities and facilities that do not require prior review or approval, and do not require submission of a sensitive area report, provided, that where the city administrator and/or his/her designee determines such activities may result in a loss to the functions and values of a habitat area or its buffer the provisions of (B) or (C) shall apply. These activities include:
  - 1. Outdoor recreational or educational activities directly related to the cultural, recreational, scientific and educational aspects of the habitat and that do not remove vegetation or otherwise affect the function of the wetland or regulated buffer (including wildlife management, viewpoints, outdoor scientific or interpretive facilities, hunting blinds, and sports fishing) and that have a minimal adverse impact on the buffer and wildlife area.
  - 2. The harvesting of wild crops 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.
  - 3. Enhancement of a water body or buffer 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 re-vegetated with native shrubs, and trees at natural densities. Some hand seeding may also be done over the bare areas with native herbs.
- B. Actions that can be planned and programmed in advance requiring notification and review in accordance with Section 19.10.060.B.2.
  - 1. Drilling for a single linear utility under a type F, Np and Ns water body. Drilling under buffers is preferred. Cut and cover installation may be approved only when impacts to buffer vegetation is minimized and mitigated. Expansion of buffer area may be required to compensate for replacement of mature vegetation with replanting.
  - 2. Installation of a single overhead utility lines that span the water body with no poles or other supports within the water body. Poles may be placed in buffers provided that impacts to vegetation is minimized and mitigated. Expansion of buffer area may be required to compensate for replacement of mature vegetation with replanting.
  - 3. Trails may be permitted within buffers if the following criteria are met:
    - a. Trails are limited to buffer areas except for limited area of pile supported trail sections or viewing areas may be placed



within water bodies outside the Core Complex for interpretive purposes.

- b. Trails shall not be permitted in buffer areas reduced through transfer of other adjustment.
  - c. Trails shall not exceed 4 feet in width and shall be surfaced with wood chips, gravel or pervious material, including boardwalks;
  - c. The trail or facility is located in the outer twenty five of a buffer, except for limited placement closer to the waters edge or within the water body for interpretive purposes for water bodies other than in the Core Complex, as provided above;
  - c. The trail or facility is constructed and maintained in manner that minimizes disturbance of the water body or buffer. Trails or facilities within water bodies shall be placed on an elevated structure as an alternative to fill.
  - d. Any adverse impacts on habitat functions and values are mitigated in accordance with Section 19.10.340.
- C. Uses and activities that shall be reviewed by a full permit process include:
- 1. Drilling for utilities under a water body in the Core Complex may be permitted if the following criteria are met:
    - a. There is no reasonable location or route outside the wetland or wetland buffer based on analysis of system needs, available technology and alternative routes. Location under a buffer shall be preferred over a location under a water body.
    - b. The drilling does not interrupt groundwater flow or recharge to the water body or percolation of surface water down through the soil column. Specific studies by hydrologist are necessary to determine whether the groundwater connection to the wetland or percolation of surface water down through the soil column is disturbed.
    - c. Staging areas are located outside the buffer.
    - d. Impacts on habitat functions are mitigated.
  - 2. Overhead utility lines that cross a water body or buffer in the Core Complex with no poles or other supports within the water body. Poles may be placed in buffers.
    - a. There is no reasonable location or route outside the water body or buffer based on analysis of system needs, available technology and alternative routes. Location within a buffer shall be preferred over a crossing of a water body..

- c. Clearing, grading, and excavation activities are limited to the minimum necessary to install the utility line, and the area is restored following utility installation.
  - d. Impacts on habitat functions are mitigated.
3. Linear utilities and facilities such as water and sewer lines providing local delivery service, but not including non-linear facilities such as electrical substations, water and sewage pumping stations, water storage tanks, and not including petroleum products pipelines and not including transformers or other facilities containing hazardous substances, may be located in the buffer of a Type F, NP and Ns stream. if the following criteria are met:
- a. There is no reasonable location or route that does not cross the water body or outside the buffer based on analysis of system needs, available technology and alternative routes. Location within a buffer shall be preferred over a location within a water body. Crossings shall be contained within the footprint of an existing road or utility crossing where possible.
  - b. Impacts to fish and wildlife habitat shall be avoided to the maximum extent possible and mitigated when avoidance is not feasible in accordance with Section 19.10.340.
  - c. Utilities that cross water bodies shall be as close to perpendicular to the channel as possible to minimize disturbance. Boring under the water body may be required.
  - d. If not a crossing, the utility line shall be located as far from the water body as possible.
  - e. The utility installation shall maintain the existing stream gradient and substrate.
  - f. Clearing, grading, and excavation activities shall be limited to the minimum necessary to install the utility line, and the area is restored following utility installation.
2. Road, railroad and similar rights-of-way, including trails not meeting the criteria in B.3, above, provided they meet the following criteria:
- a. There is no other feasible alternative route with less impact on the sensitive area or buffer.
  - b. The crossing minimizes interruption of natural processes such as the downstream movement of wood and gravel and the movement of all fish and wildlife. Bridges are preferred for all stream crossings and are required for crossings of the

Core Complex. Bridges should be designed to maintain the existing stream gradient and substrate, provide adequate horizontal clearance on each side of the ordinary high water mark and adequate vertical clearance above ordinary high water mark for animal passage. If a bridge crossing is not feasible, culverts shall be designed according to applicable state and federal guidance criteria for fish passage as identified in Fish Passage Design at Road Culverts, WDFW March 1999, and/or the National Marine Fisheries Service Guidelines for Salmonid Passage at Stream Crossings, 2000, (and subsequent revisions) and in accordance with a state Hydraulic Project Approval. The applicant or property owner shall maintain fish passage through bridge or culvert.

- c. The city may require that existing culverts be removed, repaired, or modified as a condition of approval if the culvert is detrimental to fish habitat or water quality, and a feasible alternative exists.
  - d. Crossings shall be limited to the minimum width necessary. Common crossings are the preferred approach where multiple properties can be accessed by one crossing.
  - e. Access to private development sites may be permitted to cross streams, if there are no feasible alternative alignments. Alternative access shall be pursued to the maximum extent feasible, including through the provisions of RCW 8.24. Exceptions or deviations from technical standards for width or other dimensions, and specific construction standards to minimize impacts may be specified, including placement on elevated structures as an alternative to fill, if feasible.
  - f. Any adverse impacts on habitat functions and values are mitigated in accordance with Section 19.10.340.
3. Storm water conveyance or discharge facilities such as infiltration systems dispersion trenches, level spreaders, and outfalls may be permitted in a fish and wildlife habitat conservation area buffer on a case-by-case basis when all of the following are met:
- a. Due to topographic or other physical constraints there are no feasible locations for these facilities outside the buffer;
  - b. The discharge is located as far from the ordinary high water mark as possible and in a manner that minimizes disturbance of soils and vegetation.
  - c. The discharge outlet is in an appropriate location and is designed to prevent erosion and promote infiltration.

- d. The discharge meets stormwater flow and water quality standard as provided in the 2005 Ecology Stormwater Manual for Western Washington, or the equivalent.
    - e. Any adverse impacts on habitat functions and values are mitigated in accordance with Section 19.10.340.
  4. Stream bank stabilization, shoreline protection, and public or private launching ramps may be permitted subject to all of the following standards:
    - a. Natural shoreline processes will be maintained to the maximum extent practicable. The activity will not result in increased erosion and will not alter the size or distribution of shoreline or stream substrate, or eliminate or reduce sediment supply from feeder bluffs;
    - b. Adverse impact to fish or wildlife habitat conservation areas, specifically juvenile and adult fish migration corridors, or associated wetlands will be mitigated,
    - c. Nonstructural measures, such as placing or relocating the development further from the shoreline, planting vegetation, or installing on-site drainage improvements, are not feasible or not sufficient;
    - d. Stabilization is achieved through bioengineering or soft armoring techniques in accordance with an applicable Hydraulic Project Approval is issued by the Washington Department of Fish and Wildlife;
    - e. Hard bank armoring may occur only when the property contains an existing permanent structure(s) that is in danger from shoreline erosion caused by riverine processes and not erosion caused by upland conditions, such as the alteration of natural vegetation or drainage, and the armoring shall not increase erosion on adjacent properties and shall not eliminate or reduce sediment supply;
  5. New public flood protection measures and expansion of existing measures may be permitted, provided that bioengineering or soft armoring techniques shall be used where feasible. Hard bank armoring may occur only in situations where soft approaches do not provide adequate protection, and shall be subject to requirement of the Shoreline Master Program, where applicable, Hydraulic Project Approval and other permits
  6. New docks shall be permitted only for public access, as an accessory to water-dependent uses or associated with a single-family residence provided that it is designed and used only as a

facility for access to watercraft.

- a. To limit the effects on ecological functions, the number of docks should be limited and new subdivisions should employ shared moorage whenever feasible. Docks on shorelines of the state must comply with policies and regulations of the City of Black Diamond Shoreline Master Program.
  - b. Docks shall be located and designed to minimize adverse effects on ecological processes through location where they will interfere with fluvial and limnal processes including gradient and substrate; recruitment of woody debris; and fish habitat, including that related to anadromous fish.
  - c. Docks shall minimize reduction in ambient light level by limiting width to the minimum necessary and shall not exceed four (4) feet in width, except where specific information on use patterns justifies a greater width. Materials that will allow light to pass through the deck may be required including grating on walkways or gangplanks in nearshore areas.
  - d. Approaches shall utilize piers or other structures to span the entire upper foreshore to the point of intersection with stable upland soils and shall be design to avoid interfering with stream processes.
  - e. Pile spacing shall be the maximum feasible to minimize shading and avoid a wall effect that would block or baffle currents, sediment movement or movement of aquatic life forms, or result in structure damage from driftwood impact or entrapment.
  - f. Docks should be constructed of materials that will not adversely affect water quality or aquatic plants and animals in the long term.
  - g. Space for recreation activities other than those strictly water dependent (such as water sports) are prohibited over water.
7. Launch ramps may be permitted for access to the water for the public or for residents of a development for water dependent use subject to the following criteria:
- a. Launch ramps shall be located and designed to minimize adverse effects on fluvial and limnal processes including stream gradient, and substrate; recruitment of woody debris; and fish habitat, including that related to anadromous fish.
  - b. Ramps shall be placed and maintained near flush with the bank slope. Preferred ramp designs, in order of priority, are:

- i. Open grid designs with minimum coverage of beach substrate;
  - ii. Seasonal ramps that can be removed and stored upland;
  - iii. Structures with segmented pads and flexible connections that leave space for natural beach substrate and can adapt to changes in beach profile.
8. Instream structures, such as, but not limited to, high flow bypasses, dams, and weirs, other than those regulated exclusively by the Federal Energy Regulatory Commission (FERC) shall be permitted only when the multiple public benefits are provided and ecological impacts are fully mitigated. Dams on shorelines of the state shall be regulated in accordance with the Shoreline Master Program.
  - a. Instream facilities locations shall avoid areas of high habitat value for aquatic organisms, specifically anadromous fish.
  - b. Instream facilities shall be designed to produce the least feasible effect on fluvial processes and shall minimize change in gradient.
  - c. Instream facilities shall provide mitigation of all impacts on aquatic species and habitat.
  - d. Instream facilities shall provide fish passage, in accordance with RCW 77.57.
  - e. Any adverse impacts on habitat functions and values are mitigated in accordance with Section 19.10.340.
  - f. A construction bond for 150% of the cost of the structure and all mitigation measures shall be filed prior to construction and a maintenance agreement shall specify responsibility for maintenance, shall incorporate the maintenance schedule specified by the design engineer, shall require annual inspections by a Civil Engineer licensed in the State of Washington and shall stipulate abandonment procedures which shall include, where appropriate, provisions for site restoration.
9. Facilities permitted as shoreline dependent or shoreline oriented uses in accordance with the City Shoreline Master Program, may be located in water bodies and buffers, provided that only those facilities that are water dependent or water oriented and facilities for necessary access may be located in water bodies and buffers and provided that the facility is located, designed, constructed and operated to minimize and, where possible, avoid sensitive area disturbance to the maximum extent feasible.
10. Clearing and grading, when allowed as part of an authorized use or

activity or as otherwise allowed in these standards, may be permitted provided that the following shall apply:

- a. Grading is allowed only during the designated dry season, which is typically regarded as May 1 to October 1 of each year, provided that the City may extend or shorten the designated dry season on a case-by-case basis, based on actual weather conditions.
- b. Appropriate erosion and sediment control measures shall be used at all times. The soil duff layer shall remain undisturbed to the maximum extent possible. Where feasible, disturbed topsoil shall be redistributed to other areas of the site.
- c. The moisture-holding capacity of the topsoil layer shall be maintained by minimizing soil compaction or reestablishing natural soil structure and infiltrative capacity on all areas of the project area not covered by impervious surfaces.

**19.10.335 Habitat other than fish habitat**

A. Definition and Buffers. Protection standards for fish and wildlife habitat conservation areas other than streams and lakes are as provided in the table below.

Fish and Wildlife Habitat Conservation Area	Buffer Requirement
<p>Areas with which federally listed threatened or endangered species have a primary association.</p> <p>State Priority Habitats and areas with which Priority Species have a Primary Association</p> <p>A primary association means a sensitive component(s) of the habitats of a species, which, if altered, may reduce the likelihood that the species will maintain and reproduce over the long term.</p>	<p>Buffers shall be based recommendations provided by the Washington Department of Fish and Wildlife PHS Program; provided that where no such recommendations are available, the buffer width shall be determined based on published literature concerning the species/habitat(s) in question and/or the opinions and recommendations of qualified professional with appropriate expertise.</p>
<p>Natural Area Preserves and Natural Resource Conservation Areas</p>	<p>Buffers shall be based on recommendations provided by site managers provided that the management strategies are considered effective and within the scope of this chapter.</p>
<p>Locally Important Habitat Areas</p>	<p>The need for and dimensions of buffers for locally important species or habitats shall</p>

Fish and Wildlife Habitat Conservation Area	Buffer Requirement
	be determined on a case by case basis, according to the needs of specific species or habitat area of concern. The city administrator and/or his/her designee shall coordinate with the Washington Department of Fish and Wildlife and other State, Federal or Tribal experts in these instances, and shall use WDFW PHS management recommendations when available.

- B. Alterations that occur within a locally important habitat area or that may affect a locally important species as defined herein shall be subject to review on a case-by-case basis. The city administrator and/or his/her designee shall have the authority to require an assessment of the effects of the alteration on species or habitats and may require mitigation to ensure that adverse effects do not occur. This standard is intended to allow for flexibility and responsiveness with regard to locally important species and habitats.
- C. Wildlife Corridors. Corridors providing for migration to and from areas outside the Urban Growth Area are provided in the Core Stream and Wetland Complex. Specific standards include:

Stream, Wetland or other Corridor Feature	Corridor Requirements and Management Measures
Rock Creek/Lake Sawyer/Ravensdale Creek to the north and northeast	<ul style="list-style-type: none"> <li>○ All new bridges shall provide for animal passage including height sufficient for large mammals and width sufficient for a minimum 15 foot corridor adjacent to OHWM on at least one side</li> <li>○ Existing Rock Creek/Abrams Road bridge shall be replaced at the time of development of lands served by the bridge to meet the same standards.</li> <li>○ Existing Rock Creek/Roberts Road bridge should be replaced to meet the same bridge standards when programmed as part of capital improvement program</li> </ul>
Jones Lake/Jones Creek to the east	<ul style="list-style-type: none"> <li>○ All new bridges shall provide for animal passage including height sufficient for large mammals and width sufficient for a minimum 15 foot corridor adjacent to OHWM on at least one side</li> <li>○ Existing Jones Creek/SR 169 bridge should be replaced to meet the same bridge standards when substantial improvements are made to the road, or when programmed as part of other improvements, or as part of fish passage programs.</li> </ul>
Black Diamond Lake/Black Diamond Creek to the southeast	<ul style="list-style-type: none"> <li>○ Minimum corridor width of 450' shall extend to the southeast boundary of the UGA along the general alignment of Black Diamond Creek following designated wetlands</li> <li>○ All new bridges shall provide for animal passage including height sufficient for large mammals and width sufficient for a minimum 15</li> </ul>



Stream, Wetland or other Corridor Feature	Corridor Requirements and Management Measures
	foot corridor adjacent to OHWM on at least one side ○ Existing bridge on Chub Lake Road creek shall be replaced at the time of development of lands served by the bridge to meet the same standards.

**19.10.337 Fish and wildlife habitat conservation areas - Review and reporting requirements**

The following provisions shall apply in addition to the Sensitive Area report requirements of 19.10.130:

- A. When City sensitive area maps or Washington Department of Fish and Wildlife Priority Species and Habitat information, or other sources of credible information indicate that a site proposed for development or alteration is more likely than not to contain fish and wildlife habitat conservation areas or is within the buffer of a fish and wildlife habitat conservation area, the city administrator and/or his/her designee shall require a site evaluation (field investigation) by a qualified professional or other measures to determine whether or not the species or habitat is present and if so, its relative location in relation to the proposed project area or site.
  - 1. If no fish and wildlife habitat conservation areas are present, then review will be considered complete.
  - 2. If the site evaluation determines that the species or habitat is present, the city administrator and/or his/her designee may require a sensitive areas assessment report.
  
- B. The city administrator and/or his/her designee may waive the report requirement for a single-family development that involves less than 2,000 square feet of clearing and/or vegetation removal and will not directly disturb the designated stream or pond buffer area, designated species, or specific areas or habitat features that comprise the fish and wildlife habitat conservation area (nest trees, breeding sites, etc.) as indicated by a site plan or scaled drawing of the proposed development, except in the case of Bald Eagle Habitat.
  
- C. The sensitive areas report shall describe the characteristics of the subject property and adjacent areas. The assessment shall include the following:
  - 1. Existing physical features of the site including buildings, fences, and other structures, roads, parking lots, utilities, water bodies, etc;
  - 2. Determination of the resource category and standard buffers;
  - 3. Identification of sensitive areas and buffers within three hundred (300) feet of the site and an estimate of the existing approximate acreage for each. The assessment of off-site resources shall be

based on available information and shall not require accessing off-site properties if permission of the property owner cannot be obtained;

4. Proposed development activity.
5. A detailed description of the effects of the proposed development on ecological functions and buffer function and value, including the area of direct disturbance; area of buffer reduction or averaging including documentation that functions and values will not be adversely affected by the reduction or averaging; effects of storm water management; proposed hydrologic alteration including changes to natural drainage or infiltration patterns; effects on fish and wildlife species and their habitats; clearing and grading impacts; temporary construction impacts; and effects of increased noise, light or human intrusion.
6. Provisions to reduce or eliminate adverse impacts of the proposed development activities including, but not limited to:
  - a. Clustering and buffering of development,
  - b. Retention of native vegetation,
  - c. Access limitations, including fencing.
  - d. Seasonal restrictions on construction activities in accordance with the guidelines developed by the Washington Department of Fish and Wildlife, the US Army Corps of Engineers, the Salmonid Recovery Plan and/or other agency or tribe with expertise and jurisdiction over the subject species/ habitat, and
  - e. Methods to reduce proximity impacts
  - f. Other appropriate and proven low impact development techniques.

#### 19.10.340 Mitigation Requirements

- A. **Impacts and Mitigation.** Activities that adversely affect fish and wildlife habitat conservation areas and/or their buffers should generally be avoided through site design, including clustering. Unavoidable impacts to designated species or habitats shall be compensated for through habitat creation, restoration and/or enhancement to achieve no net loss of habitat functions and values in accordance with the purpose and goals of this Chapter.
- B. **Alterations.** A fish and wildlife habitat conservation area may be altered only if the proposed alteration of the habitat or the mitigation proposed does not degrade the quantitative and qualitative functions and values of the habitat. All new structures and land alterations shall be prohibited from fish and wildlife conservation areas, except in accordance with this

chapter.

- C. **Mitigation plan.** A mitigation plan will be required for all proposed fish and wildlife conservation area alterations or to mitigate unavoidable adverse impacts to the habitat functions and values resulting from a proposed action. Mitigation plans shall be prepared in accordance with the requirements of Section 19.10.140. The mitigation plan for habitat areas provide sufficient information to demonstrate that the proposed activities are logistically feasible, constructible, ecologically sustainable, and likely to succeed. Specific information to be provided in the plan shall include, but not be limited to:
1. General description and scaled drawings of the activities proposed including, but not limited to, clearing, grading/excavation, drainage alterations, planting, invasive plant management, installation of habitat structures, irrigation, and other site treatments associated with the development activities and proposed mitigation action(s);
  2. A description of the functions and values that the proposed mitigation area(s) shall provide, together with a description of required and an assessment of factors that may affect the success of the mitigation program; and
  3. A description of known management objectives for the species or habitat.
- D. **Non-indigenous species.** Any plant, wildlife, or fish species not indigenous to the region shall be introduced into a fish and wildlife conservation area unless authorized by a state or federal permit or approval.
- E. **Mitigation standard.** Mitigation of alterations to fish and wildlife 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 to achieve functional equivalency or improvement on a per function basis.
- F. **Timing.** Required mitigation shall be completed as soon as possible following activities that will disturb fish and wildlife habitat conservation areas and during the appropriate season. Mitigation shall be completed prior to use or occupancy of the activity or development. Construction of mitigation projects shall be timed to reduce impacts to existing wildlife and flora.
- G. **Monitoring.** The city administrator and/or his/her designee shall have authority to require monitoring of mitigation activities and submittal of annual monitoring reports to ensure and document that the goals and objectives of the mitigation are met. The frequency and duration of the

monitoring shall be based on the specific needs of the project as determined by the administrator.

- H. **Mitigation and contiguous corridors.** Mitigation sites shall be located to preserve or achieve contiguous fish and wildlife habitat corridors in accordance with a mitigation plan that is part of an approved sensitive area report to minimize the isolating effects of development on fish and wildlife conservation areas, so long as mitigation of aquatic habitat is located within the same aquatic ecosystem as the area disturbed.

#### **19.10.400 Geologically Hazardous Areas**

BMC 19.10.400 through BMC 19.10.440 pertain to geologically hazardous areas.

#### **19.10.405 Designation and Mapping.**

- A. **Designations.** Geologically hazardous areas include the following:
1. Erosion hazard areas. Erosion hazard areas are those areas with soils identified by the U.S. Department of Agriculture's Natural Resources Conservation Service as having a "moderate to severe," "severe," or "very severe" rill and inter-rill erosion hazard.
  2. Landslide hazard areas. Landslide hazard areas are areas potentially subject to landslides based on a combination of geologic, topographic, and hydrologic factors. They include areas susceptible due to any combination of bedrock, soil, slope (gradient), slope aspect, structure, hydrology, or other factors. These may include the following:
    - a. Areas of historic failures, such as areas that have shown evidence of historic failure or instability, including but not limited to back-rotated benches on slopes; areas with structures that exhibit structural damage such as settling and racking of building foundations; and areas that have toppling, leaning, or bowed trees caused by ground surface movement;
    - b. Those areas delineated by the U.S. Department of Agriculture's Natural Resources Conservation Service as having a "severe" limitation for building site development;
    - c. Those areas mapped by the Washington State Department of Natural Resources (slope stability mapping) as unstable (U or class 3), unstable old slides (UOS or class 4), or unstable recent slides (URS or class 5);
    - d. Areas with all three of the following characteristics:
      - i. Slopes steeper than fifteen percent (15%); and
      - ii. Hillsides intersecting geologic contacts with a relatively permeable sediment overlying a relatively impermeable

sediment or bedrock; and

- iii. Springs or ground water seepage;
  - e. Areas potentially unstable because of rapid stream incision, stream bank erosion, and undercutting;
  - f. Any area with a slope of forty percent (40%) or steeper and with a vertical relief of ten (10) or more feet except areas composed of consolidated rock. A slope is delineated by establishing its toe and top and is measured by averaging the inclination over at least ten (10) feet of vertical relief.
  - g. Areas that are at risk of mass wasting due to seismic forces.
3. Mine hazard areas. Mine hazard areas are those areas underlain by or affected by mine workings such as adits, gangways, tunnels, drifts, or airshafts, and those areas of probable sink holes, gas releases, or subsidence due to mine workings. These are further described below in terms of degree of hazard.
4. Seismic Hazard Areas: Areas subject to severe risk of damage as a result of earthquake-induced ground shaking, slope failure, soil liquefaction or surface faulting including:
- a. Areas subject to surface faulting during a seismic event;
  - b. Areas with underlying deposits indicative of a risk of liquefaction during a seismic event;
  - c. Areas subject to slope failure during a seismic event;

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

- B. **Mapping.** The approximate location and extent of known geologically hazardous areas are shown on the Black Diamond Sensitive Areas Map(s). Those maps are resources for the identification of the probable location, extent and classification of sensitive areas. The criteria by which geological hazards are defined, and the results of field investigation shall prevail over information on the maps.

#### **19.10.410 Development Standards – Landslide Hazard Areas:**

- A. Activities allowed in landslide hazard areas The activities listed below are allowed in landslide hazardous areas in addition to those activities listed in, and consistent with, the provisions and activities established in Section 19.10.060, in accordance with the review provisions below.
- 1. Activities and facilities that do not require prior review or approval, provided, that where the city administrator and/or his/her designee determines such activities may result in a loss of functions and values of a wetland or its buffer the provisions of (B) or (C)

shall apply. These activities include.

- a. Outdoor recreational or educational activities that do not remove vegetation or displace soils or install facilities, other than temporary or small scale structures that will be abandoned in the case of earth movement.
  - b. The harvesting of wild crops 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.
2. Actions that can be planned and programmed in advance requiring notification and review in accordance with Section 19.10.060.B.2.
- a. Overhead utility lines that span the landslide hazard areas or that involve poles installed without soil movement for access roads.
  - b. Trails may be permitted within a landslide area if the trails does not exceed 4 feet in width, shall not exceed 18 inches of cut or fill and shall be surfaced with gravel or pervious material, including boardwalks;
3. Uses and activities that shall be reviewed by a full permit process include:
- a. Utility lines and pipes shall be permitted in landslide hazard areas only when the applicant demonstrates that no other practical alternative is available. The preferred design is for a line or pipe to 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;
  - b. Roads, driveways and other vehicular access, trails and walkways, may be permitted to serve existing lots and existing development, only if the applicant demonstrates that
    - i. No other feasible alternative exists, including through the provisions of RCW 8.24, and
    - ii. If analysis by a qualified professional establishes compliance with the standards in subsection C, below.
  - c. Alteration of a landslide hazard area and buffer in order to accommodate structures or land alteration may be authorized

only in cases where the city administrator and/or his/her designee finds that

- i. Reasonable development cannot be accommodated on portions of the site not subject to landslide hazards and buffers, and
  - ii. If analysis by a qualified professional establishes compliance with the standards in subsection C, below.
- d. Point discharges from surface water facilities and roof drains onto or upgradient from an erosion or landslide hazard area shall be prohibited.
- e. Vulnerable facilities, including, but not limited to, schools, nursing homes, hospitals, police, fire and emergency response installations, and installations that produce, use, or store hazardous materials shall not be located in landslide hazard areas if there is a feasible alternative location outside the hazardous areas that would serve the intended service population. A facility may be allowed only subject to the standards in subsection (C), below.

**B. Buffer requirement.** A buffer shall be established from all edges of landslide hazard areas. The size of the buffer shall be determined by the city administrator and/or his/her designee to eliminate or minimize the risk of property damage, death, or injury resulting from landslides, based upon review of and concurrence with a sensitive area report prepared by a qualified professional.

1. **Minimum buffer from the top of a slope.** The minimum buffer from the top of a slope shall be designed to protect persons and property from damage due to catastrophic slope failure and slope retreat over the lifetime of the use and provide an area of vegetation to promote shallow stability, control erosion and promote multiple benefits to wildlife and other resources. The minimum dimension of the buffer shall be equal to the greater of:
  - a. Shall be equal to the height of the slope (the vertical distance from the toe of slope to the top of slope, for a 40% or greater slope, this shall be from the top of the portion of the slope which is a 40% slope, provided that another 40% slope is not located within the buffer area, in that case, the buffer shall be located from the top of the highest 40% slope).
  - b. The distance from the top of slope equal to the distance from the toe of slope upslope at a slope of 2:1 (horizontal to vertical) to a point that intersects with the site's ground elevation., or

- c. Fifty (50) feet from the top of the slope.
2. **Minimum buffer from the bottom of a slope.** The minimum buffer from the bottom of a slope shall provide for safety of persons and property from the run-out resulting from slope failure and shall be the greater of:
  - a. The height of the slope, or
  - b. 50 feet from the toe of the slope.
3. **Minimum buffer from the side of a slope.** The minimum buffer from the bottom of a slope shall provide for safety of persons and property from the run-out resulting from slope failure and shall be the greater of:
  - a. 25 feet from the toe of the slope, or.
  - b. A triangular area that extends from the edge of the top of the slope outward at a 1:3 angle (one horizontal foot to three vertical feet)
4. **Buffer reduction.** The buffer may be reduced to a minimum of ten (10) feet when a qualified professional demonstrates to the satisfaction of the city administrator and/or his/her designee that the reduction will adequately protect the proposed development, adjacent developments, proposed uses and the subject sensitive area and meet the development standards in subsection C.
5. **Increased buffer.** The buffer may be increased where the city administrator and/or his/her designee determines through best available science documented in a sensitive area report prepared by a qualified professional that a larger buffer is necessary to prevent risk of damage to proposed and existing development or to meet the development standards in subsection C.

**C. Criteria and Design Standards for Landslide Hazard Areas.**

All uses and activities in landslide hazard areas shall conform to the following standards:

1. No use or alteration of a landslide hazard area and buffer may be authorized except where the city administrator and/or his/her designee finds that
  - a. reasonable development cannot be accommodated on portions of the site not subject to landslide hazards and buffers, and
  - b. if analysis by a qualified professional establishes compliance with the following standards, based on specific development plans:



- i. The proposed development will not result in a risk of landslide that may affect development on the subject property or other properties in the vicinity, and will not result in a greater risk or a need for increased buffers on neighboring properties; For unconsolidated deposits, 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 International Building Code.
- ii. Measures to maintain slope stability, such as drainage systems, must be of a design that will assure operation without facilities requiring regular maintenance that would jeopardize stability if the facility fails.
- iii. The development will not increase erosion or sedimentation risk on the site;
- iv. The development will not increase surface water discharge or sedimentation to adjacent properties beyond pre-development conditions;
- v. Such alterations will not adversely impact other sensitive areas;
- vi. Structures shall be located on the least sensitive portion of the site and clustered where possible to reduce disturbance and removal of vegetation.
- vii. Structures will meet the following design standards:
  - (A) Grading shall minimize alterations to the natural contour of the slope,
  - (B) Foundations should conform to the natural contours of the slope and foundations should be stepped/tiered where possible to conform to existing topography of the site;
  - (C) Retaining walls shall be preferred over cut and fill and shall be incorporated into structures wherever feasible.
- viii. Landslide hazard areas on unconsolidated deposits with a gradient of 40 percent where the toe of slope is within the buffer area of a wetland, stream, pond or lake are not eligible for alteration of landslide hazard areas or but may be subject to alteration of buffers, subject to compliance with the standards of this chapter.

2. Division of land within or adjacent to landslide hazard areas and associated buffers shall be clustered to avoid landslide hazard areas and associated buffers. Land that is located partially within a landslide hazard area or its buffer may be divided provided that each resulting lot has sufficient buildable area outside of the landslide area and buffer with provision for access, drainage, erosion control and related features that will not adversely affect the stability of the landslide area.
3. 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 preferred design is for a line or pipe to 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;
4. Roads, driveways and other vehicular access, trails and walkways, may be permitted only if the applicant demonstrates that no other feasible alternative exists, including through the provisions of RCW 8.24 and subject to the standards in 1., above. If access through a hazard area is granted, exceptions or deviations from technical standards for width or other dimensions, and specific construction standards to minimize impacts may be specified. Access roads and trails shall be engineered and built to standards that avoid the need for major repair or reconstruction beyond that which would be required in non-hazard areas and shall be:
  - a. Located in the least sensitive area of the site.
  - b. Designed to minimize topographic modification with low gradients and/or parallel to the natural contours of the site.
  - c. Retaining walls shall be preferred over cut and fill slopes to minimize topographic modification.
  - d. Clearing and grading shall minimize ground disturbance to the maximum extent feasible to accommodate allowed development and generally shall not extend more than 10 feet beyond the approved development;
5. A qualified professional, licensed in the state of Washington, shall review project plans in landslide hazardous areas to ensure that they are properly designed and shall certify that they have inspected the construction of facilities and the facilities are constructed to incorporate all required facilities to meet the standards above, and no unanticipated features were identified during construction that change the design required to meet said

standards. If any unanticipated features related to bedrock, soil, slope (gradient), slope aspect, structure, geologic contacts with a relatively permeable sediment overlying a relatively impermeable sediment or bedrock; hydrology including springs or ground water seepage or stream geomorphology relating to stream bank erosion or undercutting are identified during construction that were not anticipated in the initial review, the qualified professional shall be responsible for the cessation of work if the conclusions of the initial review are no longer valid and report to the city administrator and/or his/her designee.

**19.10.415      Landslide Hazard Review and Reporting Requirements**

- A. When sensitive area maps or other sources of credible information indicate that a site proposed for development or alteration is or may be located within a landslide hazard area the city administrator and/or his/her designee shall have the authority to require the submittal of a landslide hazard assessment report. The following provisions shall apply in addition to the Sensitive Area report requirements of 19.10.130:
- B. The landslide hazard assessment shall describe and evaluate the geologic characteristics of the subject property and adjacent areas. The landslide hazard assessment shall include field investigation and may include the analysis of historical aerial photographs, review of public records and documentation, and interviews with adjacent property owners. The report shall include the following, provided that the city administrator and/or his/her designee may determine that any portion of these requirements is unnecessary given the scope and/or scale of the proposed development:
  - 1. A description of which areas on the site, surrounding areas that influence or could be influenced by the site, or areas within three hundred (300) feet of the site meet the criteria for a landslide hazard.
  - 2. A scaled site plan showing:
    - a. The type and extent of landslide hazard areas, and any other sensitive areas, and buffers on, adjacent to or that are likely to impact or influence the proposal, including properties upslope of the subject site;
    - b. The location of existing and proposed structures, fill, access roads, storage of materials, and drainage facilities, with dimensions;
    - c. The existing site topography preferably accurate to within two-foot contours; and
    - d. Clearing limits.
  - 3. A description of the site features, including surface and subsurface

geology, hydrology, soils, and vegetation found in the project area and in all hazard areas addressed in the report. This may include surface exploration data such as borings, drill holes, test pits, wells, geologic reports, and other relevant reports or site investigations that may be useful in making conclusions or recommendations about the site under investigation;

4. A description of the processes affecting the property or affected by development of the property including geologic processes, soil or water erosion, deposition, or accretion;
5. A description of the vulnerability of the site to seismic and other geologic processes and a description of any potential hazards that could be created or exacerbated as a result of site development.

C. Analysis of potential risks shall include:

1. A description and analysis of the level of risk associated with no development on the landslide hazard area and buffers;
2. A description and analysis of the level of risk associated with alternative proposals for development within or with less setback from the area of landslide hazard including risk to future occupants of the subject property, adjacent property, other sensitive areas and the general public safety;
3. A description and analysis of the level of risk associated with the measures proposed to mitigate the hazards, ensure public safety, and protect property and other sensitive areas, including the risk of failure if structures, drainage systems or other facilities are not monitored, maintained, or cease to function as designed for any reasons;
4. A description and analysis of the level of risk associated with increased erosion or sedimentation risk on the site and potential effects on adjacent properties, water bodies and wetlands.
5. Assessments and conclusions regarding slope stability for both the existing and developed conditions including the potential types of landslide failure mechanisms (e.g., debris flow, rotational slump, translational slip, etc.) that may affect the site. The stability evaluation shall also consider dynamic earthquake loading, and shall use a minimum horizontal acceleration as established by the current version of the International Building Code;
6. Description of the potential run-out hazard of landslide debris related to the proposed development that starts upslope (whether part of the subject property or on a neighboring property) and/or the impacts of landslide run-out on down slope properties and sensitive areas;
7. For proposed development on unconsolidated deposits, analysis of

whether the development results in a 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 International Building Code.

8. The analysis shall include evaluation of stability under seismic conditions for both unconsolidated deposits and bedrock.

**19.10.420 Development Standards – Erosion Hazard Areas:**

- A. **Activities allowed in erosion hazardous areas.** Erosion hazard areas have soil and slope conditions such that development must incorporate adequate control in order to avoid soil movement and potential impacts on downgradient resources, including water quality and aquatic habitat. Activities in erosion control areas shall be subject to the following standards.
- B. **Landslide hazard areas.** Except as otherwise provided for in this chapter, only those activities approved and permitted consistent with an approved sensitive area report in accordance with this chapter shall be allowed in erosion or landslide hazard areas.
- C. **Development standards**
  1. Structures shall be located on the least sensitive portion of the site and clustered where possible to reduce disturbance and removal of vegetation.
  2. Grading shall minimize alterations to the natural contour of the slope. Building foundations shall conform to the natural contours of the slope and be stepped/tiered to conform to existing topography of the site;
  3. Retaining walls shall be preferred over cut and fill for roads, parking lots and structures. Structures on slopes in excess of 25% shall incorporate earth retaining structures in buildings rather than employing free-standing earth retention structures. d. Clearing and grading shall minimize ground disturbance to the maximum extent feasible and generally shall not extend more than 10 feet beyond the approved development;
  4. All structures or impervious surface improvements shall be required to have on-site drainage systems to meet the specifications of the public works department to control conveyance of stormwater to avoid erosion hazard areas. Point discharges or overland dispersion systems from surface water facilities and roof drains onto or upstream from an erosion or landslide hazard area shall be prohibited from discharging onto slopes in excess of 5%. Conveyance should be provided to the foot of slopes..
  5. Roads, driveways and other vehicular access, trails and walkways,

shall be

- a. Located in the least sensitive area of the site.
- b. Designed to minimize topographic modification with low gradients and/or parallel to the natural contours of the site.
- c. Retaining walls shall be preferred over cut and fill slopes to minimize topographic modification.

**19.10.425 Erosion hazard area review and reporting requirements**

- A. When sensitive area maps or other sources of credible information indicate that a site proposed for development or alteration is or may be located within a erosion hazard area the city administrator and/or his/her designee shall have the authority to require the submittal of a erosion hazard assessment report. The following provisions shall apply in addition to the Sensitive Area report requirements of 19.10.130:
- B. The erosion hazard assessment shall describe and evaluate the soil characteristics of the subject property and adjacent areas. The erosion hazard assessment shall include field investigation. The report shall include the following, provided that the city administrator and/or his/her designee may determine that any portion of these requirements is unnecessary given the scope and/or scale of the proposed development:
  1. A description of areas on the site and the surrounding areas that influence or could be influenced by the site, or areas within three hundred (300) feet of the site meet the criteria for an erosion hazard.
  2. A scaled site plan showing:
    - a. The type and extent of soils subject to erosion hazard, and any other sensitive areas, and buffers on, adjacent to or that are likely to impact or be impacted by the proposal, including surface water, wetlands and other downgradient features;;
    - b. The location of existing and proposed areas of clearing, structures, fill, access roads, storage of materials, and drainage facilities, with dimensions;
    - c. The existing site topography preferably accurate to within two-foot contours; and
    - d. Proposed erosion control and drainage control features and facilities.
- C. Analysis of potential erosion and best management practices to control erosion:
  1. A description and analysis of the level of erosion associated with no development within the erosion hazard area;
  2. A description and analysis of the level of erosion associated

with the proposal and alternatives;

3. A description and analysis of design features that could reduce erosion, including development standards within this section and other BMPs;
4. A description and analysis of the level of risk of sedimentation, degradation of water quality, impacts on aquatic species or other effects of the proposal and alternative design and BMPs.

**19.10.430 Mine hazard areas:**

A. Declassification of mine hazard areas. Areas underlain by mine workings may be declassified as a hazard area by the city administrator and/or his/her designee based on a detailed mine hazard study, field work, and completion of required mitigation to eliminate hazards of open workings, sinkholes, gas, fire and waste dumps and reduce the potential for settlement to 1:350 for ground tilt and 0.002 i/in strain such that hazards of mine workings are equivalent to lands not underlain by mines.

B. Activities allowed in mine areas of low hazard are defined as locations where:

- All workings are at a depth of more than three hundred feet or where a previous mine hazard assessment report has determined that all workings have collapsed or that potential subsidence is limited to no more than 1:350 for ground tilt and 0.002 i/in strain, and
  - No unmitigated openings such as entries, portals, adits, mine shafts, air shafts, timber shafts, sinkholes, improperly filled sinkholes, tailings and other areas of past or significant probability for catastrophic ground are within 100 feet of the location.
1. The city administrator and/or his/her designee may allow without a detailed hazard assessment:
    - a. Overhead utility lines;
    - b. Trails and passive recreation uses;
    - c. Mobile homes not on a rigid foundation
    - d. Construction of new buildings with less than 2,500 square feet of floor area or roof area, whichever is greater, and which are not residential structures or used as places of employment or public assembly;
    - e. Additions to existing residences that are 250 square feet or less; and
    - f. Installation of fences.
  2. All other uses may be allowed only if analysis by a qualified professional establishes compliance with the following standards, based on a specific risk assessment and remediation plans:

- a. The risk of sinkhole development is reduced to a level no greater than other properties not affected by mine workings, and..
  - b. The risk of other public safety hazards related to underground workings and or waste dumps is reduced to a level no greater than other properties not affected by mine workings, and.
  - c. If the site could be subject to trough subsidence due to collapse of mine workings, remediation plans shall include site-specific design specifications that can accommodate calculated potential subsidence effects as required in development standards in Subsection D, below.
3. Vulnerable facilities, including, but not limited to, schools, nursing homes, hospitals, police, fire and emergency response installations, and installations that produce, use, or store hazardous materials shall not be located in mine hazard areas if there is a feasible alternative location outside the hazardous areas that would serve the intended service population. A facility may be allowed only subject to the standards in Subsection E, below.

**B. Activities allowed in mine areas of moderate hazard** defined as locations that pose significant risks of property damage that may be mitigated by implementing special engineering or architectural recommendations. These are locations that typically include, but are not limited to:

- Mine workings that are at a depth of 150 feet to 300 feet below the surface of the land, or
  - No unmitigated openings such as entries, portals, adits, mine shafts, air shafts, timber shafts, sinkholes, improperly filled sinkholes, tailings and other areas of past or significant probability for catastrophic ground are within 100 feet of the location.
1. The city administrator and/or his/her designee may allow without a detailed hazard assessment: overhead utility lines.
  2. All other uses may be allowed only if analysis by a qualified professional establishes compliance with the following standards, based on a specific risk assessment and remediation plans:
    - a. All entries, portals, adits, mine shafts, air shafts, timber shafts, sinkholes, improperly filled sinkholes and other areas of past or significant probability for catastrophic ground are mitigated in compliance with development standards in Subsection D;
    - b. The risk of sinkhole development is reduced to a level no



greater than other properties not affected by mine workings, and..

- c. The risk of other public safety hazards related to underground workings and or tailings is reduced to a level no greater than other properties not affected by mine workings, and.
  - d. If the site could be subject to trough subsidence due to collapse of mine workings, remediation plans include site-specific design specifications that can accommodate calculated potential subsidence effects as required in development standards in Subsection E, below.
3. Vulnerable facilities, including, but not limited to, schools, nursing homes, hospitals, police, fire and emergency response installations, and installations that produce, use, or store hazardous materials shall not be located in a moderate mine hazard areas if there is a feasible alternative location outside the hazardous areas that would serve the intended service population. A facility may be allowed only subject to the standards in Subsection D, below.

C. **Activities allowed in mine areas of severe hazard** defined as locations that pose a significant risk of catastrophic ground surface collapse. These are locations that typically include, but are not limited to:

- coal mine workings from a depth of less than one hundred fifty feet from the surface of the land,
  - unmitigated openings such as entries, portals, adits, mine shafts, air shafts, timber shafts,
  - sinkholes, improperly filled sinkholes and other areas of past or significant probability for catastrophic ground
1. All uses and activity require analysis by a qualified professional compliance with specific risk assessment and remediation plans and include:
    - a. Remediation of hazards related to entries, portals, adits, mine shafts, air shafts, timber shafts, sinkholes, improperly filled sinkholes, mine tailings and other areas of past or significant probability for catastrophic ground are mitigated in compliance with development standards in Subsection (E) to a standard that reduces risk of personal injury and risk of damage to structures and public facilities to a level similar to lands not underlain by mine workings.
    - b. The preferred use for areas of severe mine hazard are:
      - i. Open space and passive recreation facilities with no public assembly,

- ii. Public facilities that must traverse the area, such as roads and utilities.
2. Vulnerable facilities, including, but not limited to, schools, nursing homes, hospitals, police, fire and emergency response installations, and installations that produce, use, or store hazardous materials are prohibited in such areas.

#### **D. Performance standards**

Development on or near a mine hazard area requires applicant to first demonstrate that hazards to health or safety, persons, or property at the proposed site as a result of the development is equivalent to land not underlain by mine workings. If a proposal is located on or near a mine hazard area, a study by a qualified professional geotechnical specialist may be required.

1. Development within mine hazard areas shall be accompanied by technical studies by qualified professionals that assess the potential risk from entries shafts and ventilation facilities, of potential future trough subsidence or sinkhole development due to collapse of abandoned coal mines and identifies specific measures to mitigate the risk in accordance with the criteria below:
  - a. Mine entries and shafts shall be permanently sealed using controlled backfill and/or grouting, or an approved, engineered seal and shall include permanently diversion of surface drainage away from the shaft or mine entry.
  - b. Existing sinkholes and shallow prospect excavations shall be backfilled to surface using controlled placement of suitable backfill and shall include permanently diversion of surface drainage away from existing sinkholes and prospect excavations.
  - c. Potential Sinkhole hazards shall be assessed by a qualified professional utilizing direct subsurface investigation that demonstrate coal mine workings either do not exist, or that the workings have collapsed so that there is no remaining potential for sinkhole development; or show that the hazards associated with any voids that are identified are fully mitigated by backfilling, grouting, or other approved means such that the potential for sinkhole development is eliminated.
  - d. Any mine tailings or other fill materials shall be:
    - i. Demonstrated to be stable through analysis by a qualified professional, or if such material does not meet stability criteria it shall be regarded or otherwise mitigated to meet stability criteria.

- ii. If springs or seeps discharge from such areas, materials shall be removed or regraded to expose the source of the spring or seep.
  - iii. Mine tailings or fill materials shall be covered with a minimum two feet of clean soil and be revegetated with native vegetation to control erosion, unless an alternative specific use has been approved.
  - iv. Development shall not be permitted within 100 feet of tailings or fill materials that shows evidence of current or past combustion, unless combustible materials are removed.
  - v. Development may be permitted over mine tailings or fill material only if a investigation and analysis by a qualified professional identifies feasible construction criteria for foundation stability and performance.
  - e. Mine Gas hazards shall be mitigated by backfilling all mine entries, shafts, and sinkholes in and providing appropriate venting.
  - f. Mine fire potential shall be assessed through analysis by a qualified professional. Development shall not be permitted within 100 feet of workings where investigations indicate the possible presence of combustion in the underlying seam or seams.
2. Every development shall include appropriate construction standards established by a qualified professional in accordance with the criteria below:
- a. Foundations shall be designed by a Washington State licensed structural engineer, with consideration of the subsidence effects documented for the site and the requirements of the International Building Code as provided by the criteria below:
    - i. Foundations and slabs on grade shall be designed to resist the ultimate forces for tension and/or compression as determined from the hazards report. The forces generated by subsidence effects of tilt and strain shall be treated as live loads with the appropriate load factors and/or factors of safety in design. Simultaneous friction drag force and lateral earth pressure loads shall be treated as earth pressure in load combinations.
    - ii. Ultimate passive soil pressure and distribution shall be assessed for all vertical surfaces in contact with

- foundation soil due to horizontal strain occurring from a subsidence and included in design specifications.
- iii. Utility lines shall not be rigidly connected to the foundation wall. A flexible joint shall be provided at the point of transition from soil support to building support for all utilities.
  - iv. Positive drainage shall be designed for positive gravity flow under the most sensitive predicted subsidence conditions.
- b. Roads and utilities shall be designed to accommodate the magnitudes of strains and tilts documented by technical studies through adequate strength to resist the forces of maximum predicted subsidence-related tilts and strains, or by adequate flexibility to accommodate the resulting deformations.
- i. Roadways shall be flexible material and shall be designed to maintain positive drainage with the maximum predicted subsidence.
  - ii. Bridges shall be designed to a factor of safety of 2 to accommodate maximum strains and tilts predicted.
  - iii. Water utilities shall be designed to provide for two times the maximum predicted tilts and strains, including service lines, structures, and related appurtenances.
  - iv. Sewer and storm drainage utility design shall provide for 1.5 times the maximum predicted tilts and strains, including service lines, structures, and related appurtenances. Design grades shall provide positive gradient after allowing for the maximum predicted subsidence.
  - vi. Storm drainage detention and retention facilities shall be designed to remain functional following the occurrence two times the maximum predicted tilts and strains. Such facilities may be located in mine hazard areas only if all risk of sinkhole development has been eliminated.
  - vii. Electric and gas cables and pipelines shall be designed to accommodate the maximum predicted tilts and strains with suitable safety factors applied to these magnitudes such that failure of the utility line will not present a risk to public safety. The applicant shall

present certification from the respective private utility that utilities have been designed in accordance with the above.

**19.10.435 Mine hazard review and reporting requirements**

A mine hazard study shall be prepared by a qualified professional that addresses the information and criteria below, provided that the city administrator and/or his/her designee may accept and review a preliminary report with limited content to outline the potential hazard level and propose a suggested analysis methodology. The administrator may retain, at the applicant's expense, an independent qualified professional to perform a peer review of the mine hazard report.

- A. A mine hazard report shall contain all available documentary information about mine workings and the results of a surface reconnaissance that shall identify any public safety mine hazards, mine waste dumps, or evidence of mine subsidence or sinkholes and shall include:
  - 1. Historical mining data, including available copies of original mine records for mine workings.
  - 2. A map showing property boundaries, mine hazard boundaries, and any potential hazards identified on or within 300 feet of the property.
- B. Shallow hazards such as entry portals, shaft collars, ventilation shafts, prospects and mine waste dumps may be investigated by test pits or trenching, providing the method enables investigation to an adequate depth for the hazard being investigated.
- C. Site-Specific Evaluation of Potential Trough Subsidence
  - 1. Review of Available Records of original mine workings that could potentially influence the site by trough subsidence.
    - a. locations, depths, and thicknesses of such seams and workings
    - b. workings that could potentially influence the site shall be determined by projecting the downdip limit angle from the lowest limit of the documented workings to the ground surface. Mine workings are considered to potentially influence the property if the property lies within the line at which the limit angle intersects the ground surface.
  - 2. Subsurface conditions may be evaluated by drilling. Drilling is the most acceptable method for providing information for reducing the Remaining Mine Height value used in subsidence calculations to less than the height of the original workings.
    - a. Drillholes shall be logged continuously from 100 feet above

- to 20 feet below mine workings, including lithology at 5-foot intervals, drill fluid circulation, penetration rate, and free fall of the drill string.
- b. Greater confidence will be placed in core drilling logs than rotary drilling logs.
  - c. As a guideline, a minimum of one drillhole penetrating each seam that could potentially cause trough subsidence at the site should be drilled for each 200 foot length of the adit, unless alternative spacing is demonstrated to provide adequate information concerning the workings.
  - d. Surface geophysics, or other indirect means, may be used to assist in projecting information between and beyond drillholes, but shall not be accepted as the sole method for evaluating the condition of underground mine workings and calculating Remaining Mine Height.
3. Calculation of Trough Subsidence Magnitudes, Tilts, and Strains shall be in accordance with the empirical function method of the British National Coal Board, as presented in their Subsidence Engineers' Handbook, adjusted to reflect the effects of inclined seams and a downdip limit angles encountered and shall be based on a conservative evaluation of site conditions developed from the review of available records, site investigation and subsurface exploration.
- a. Direct field evidence or a review of detailed mine records shall be used to calculate the subsidence factor, the downdip limit angle.
  - b. Remaining Mine Height shall be presumed to be equal to the seam thickness for the subsidence calculations unless evidence from drilling justifies modification.
  - c. The calculation of potential tilts and strains shall consider effects of individual panel widths and barrier pillar widths. If direct subsurface investigation indicates that the mine workings are fully collapsed, an estimate of potential surface settlements due to consolidation of rubble and loose material shall be made for the cumulative effect of all seams that could induce trough subsidence at the site.
4. Site plans shall be prepared showing the proposed development and calculated magnitudes of potential subsidence, strains, and tilts at the property boundaries and at the locations of any proposed structures.
- a. A map showing contours of potential subsidence magnitudes,

strains, and tilts throughout the property shall be submitted for use in design of roads and utilities.

- b. Appropriate recommendations shall be provided for structural and civil design requirements.

D. Site-Specific Evaluation: Potential Sinkhole Hazards

1. Review of Available Record shall be as in (1)(a) above.
2. Subsurface conditions for workings located within 150 feet of the ground surface shall be investigated by drilling.
  - a. Drillhole sites shall be selected at representative locations and at representative working depths. A minimum of five drillholes shall be drilled along the alignment of any linear structure, such as roads or utility lines designed to cross a mine hazard area. No fewer than one drillhole per acre shall be provided for a site.
  - b. Core drilling is preferred, but is not compulsory. Rotary drilling is an acceptable method provided it is used in combination with downhole geophysical logging, including caliper logs. Drilling shall penetrate immediately above and through the predicted workings locations to facilitate interpretation of the condition of the mine workings.
  - c. Drillholes shall be logged continuously throughout their length, including lithology at 5-foot intervals for rotary drillholes, drill fluid circulation, penetration rate, and free fall

**19.10.440 Seismic Hazard Areas**

Development may be allowed in seismic hazard areas when all of the following apply:

- A. If evaluation of site-specific subsurface conditions by a qualified professional demonstrates that the proposed development site is not subject to the conditions indicating seismic risk in, the provisions of this subsection shall not apply.
- B. If a site is subject to seismic risk, the applicant shall implement appropriate engineering design based on analysis by a qualified professional of the best available engineering and geological practices that either eliminates or minimizes the risk of structural damage or injury resulting from seismically induced settlement or soil liquefaction, including compliance with the following criteria:
  1. Subdivision within a seismic hazard areas shall assure that each resulting lot has sufficient buildable area outside of the hazard area or that appropriate limitations on building and reference to appropriate standards are incorporated into subdivision approval and may be placed as restrictions on the face of the plat;
  2. Structures in seismic hazard areas shall conform to applicable

- analysis and design criteria of the International Building Code;
3. Public Roads, bridges, utilities and trails shall be allowed when there are no feasible alternative locations and geotechnical analysis and design are provided that ensure the roadway, bridge and utility structures and facilities will not be susceptible to damage from seismic induced ground deformation. Mitigation measures shall be designed in accordance with the most recent version of the American Association of State Highway and Transportation Officials (AASHTO) Manual or other appropriate document.
- C. The city administrator and/or his/her designee may waive or reduce engineering study and design requirements for alterations in seismic hazard areas for:
1. Mobile homes;
  2. Additions or alterations to existing structures that do not increase occupancy or significantly affect the risk of structural damage or injury; and
  3. Buildings that are not dwelling units or used as places of employment or public assembly.

**19.10.445 Seismic hazard review and reporting requirements**

- A. When sensitive area maps or other sources of credible information indicate that a site proposed for development or alteration is or may be located within a geologically hazardous area the city administrator and/or his/her designee shall have the authority to require the submittal of a seismic hazard assessment report. The following provisions shall apply in addition to the Sensitive Area report requirements of 19.10.130:
- B. An existing conditions assessment and investigation to evaluate the geologic characteristics of the subject property and adjacent areas and their susceptibility to damage during a seismic event.
1. The seismic assessment shall include field investigation and may include the analysis of historical aerial photographs, review of public records and documentation, and interviews with adjacent property owners, provided that the city administrator and/or his/her designee may determine that any portion of these requirements is unnecessary given the scope and/or scale of the proposed development:
  2. A description of the general surface and subsurface geology, hydrology, soils, and vegetation found in the project area, including faults and indicators of earth movement, past seismic events and other features that would affect the site response to seismic conditions. This may include surface exploration data such as borings, drill holes, test pits, wells, geologic reports, and other relevant reports or regional, local and site investigations that may be useful in making conclusions or recommendations about the site



under investigation;

- C. A description of the vulnerability of the site and structures to seismic and other geologic processes and a description of any potential hazards that could be created or exacerbated as a result of site development.
1. Evaluation of the current design in terms of the risk of structural damage or injury resulting from seismically induced stress, settlement, soil liquefaction, and other processes.
  2. A description and evaluation of the best available engineering and geological practices that either eliminates or minimizes the risk of structural damage or injury resulting from seismic forces including public roads, utilities and other features.

**19.10.500 Sensitive Aquifer Recharge Areas**

**A. Classification.**

Aquifer recharge areas are categorized according to the following criteria.

1. Category I - Severe Aquifer Sensitivity. "Category I - Severe aquifer sensitivity" are those areas which provide rapid recharge with little protection, having highly permeable soils. The predominant soil series and types are those listed in Category I in Table 1.
2. Category II - Moderate Aquifer Sensitivity. "Category II - Moderate aquifer sensitivity" are those areas with aquifers present, but which have a surface soil material that encourages run-off and slows water entry into the ground. The predominant soil series and types are those listed as Category II in Table 1.
3. Category III - Slight Aquifer Sensitivity. "Category III - Slight aquifer sensitivity" are those areas of low ground water availability and whose soil series are derived from basaltic, andesitic, or sedimentary rock or ancient glacial till which are parent material for soils with more clays at the surface. These geological formations do not provide abundant ground water. The predominant soil series and types are those listed as Category III in Table 1.

**Table 19.10.500.A – Aquifer Sensitivity Ratings for Soil Texture**

Soil Texture <sup>1</sup>	DRASTIC Rating <sup>1</sup>	Sensitivity
Thin or Absent <sup>3</sup>	10	Category I - Severe
Gravel	10	Category I - Severe
Sand	9	Category I - Severe
Peat	8	Category I - Severe
Shrink/Swell Clay	7	Category II - Moderate

Sandy loam	6	Category II - Moderate
Loam	5	Category II - Moderate
Silt loam	4	Category II - Moderate
Clay loam	3	Category III - Slight
Muck	2	Category III - Slight
Non-shrink/Swell Clay	1	Category III - Slight

1. The DRASTIC Index (Aller et.al. June 1987) was developed cooperatively between the National Water Well Association (NWWA; now the National Ground Water Association) and the U.S. Environmental Protection Agency (EPA) to rank soil types with respect to pollution transport potential.

**Table 19.10.500.B – Aquifer Sensitivity Ratings for Soil Units**

Soil Series Name & Map Unit Symbol	Category I Severe	Category II Moderate	Category III Slight
Alderwood gravelly sandy loam (Ag)		X	
Alderwood and Kitsop soils, very steep (AkF)		X	
Beausite gravelly sandy loam (Be)		X	
Bellingham silt loam (Bh)		X	
Buckley silt loam (Bu)		X	
Everett gravelly sandy loam (Ev)		X	
Mixed alluvial land (Ma)		X	
Norma sandy loam (No)		X	
Ragnar-Indianola association, sloping (RdC)		X	
Seattle muck (Sk)			X
Shalcar muck (Sm)			X

**B. Prohibited Uses and Criteria**

1. The following new development proposals and alterations are not allowed on a site located in a category I sensitive aquifer recharge area:
  - a. Disposal of radioactive wastes, as defined in chapter 43.200 RCW;
  - b. Hydrocarbon extraction;
  - c. Commercial wood treatment facilities;
  - d. Class V injection wells, but limited to subclasses 5F01, 5D03, 5D04, 5W09, 5W10, 5W11, 5W31, 5X13, 5X14,

5X1S, 5W20, 5X28, and 5N24;

- e. Underground storage tanks, including tanks exempt from the requirements of chapter 173-360 WAC, with hazardous substances, as defined in chapter 70.105 RCW, that do not comply with the requirements of chapter 173-360 WAC and K.C.C. Title 17;
  - f. Above ground storage tanks for hazardous substances, as defined in chapter 70.105 RCW, unless protected with primary and secondary containment areas and a spill protection plan;
  - g. Landfills for hazardous waste, or special waste, as defined in WAC173-303;
  - h. Wrecking yards;
  - i. Electroplating;
  - j. Solid waste handling and processing facilities
  - k. Dry cleaners, excluding drop-off only operations;
  - l. Landfills for municipal solid waste;
  - m. Transmission pipelines carrying petroleum or petroleum products;
  - n. Sand and gravel, and hard rock mining
  - o. Mining of any type below the upper surface of the saturated ground water that could be used for potable water supply;
  - p. Vehicle repair
  - q. Biological research
  - r. Chemical manufacturing, mixing and remanufacturing
  - s. Golf courses;
  - t. Cemeteries;
2. Except as otherwise provided in subsection C. of this section, the following new development proposals and alterations are not allowed on a site located in a category II sensitive aquifer recharge area: items (a) through (i) in subsection (B)(1) above.
3. Except as otherwise provided in subsection C. of this section, the following new development proposals and alterations are not allowed on a site located in a category III sensitive aquifer recharge area: items (a) through (h) in subsection (B)(1) above.
- C. The following standards apply to development proposals and alterations that are substantial improvements on a site located in a sensitive aquifer recharge

area:

1. The owner of an underground storage tank, including a tank that is exempt from the requirements of chapter 173 WAC, in a category I, II or III sensitive aquifer recharge area shall either bring the tank into compliance with the standards of chapter 173 WAC and or properly decommission or remove the tank; and
2. A development proposal for new residential development, including, but not limited to, a subdivision, short subdivision, or dwelling unit, shall incorporate best management practices in order to infiltrate stormwater runoff to the maximum extent

#### **19.10.600 Definitions.**

Words not defined in this chapter shall be as defined in the city code, the Washington Administrative Code, or the Revised Code of Washington. Words not found in either code shall be as defined in the Webster's Third New International Dictionary, latest edition.

**19.10.601 *Adjacent*** – Immediately adjoining (in contact with the boundary of the influence area) or within a distance that is less than that needed to separate activities from sensitive areas to ensure protection of the functions and values of the sensitive areas. *Adjacent* shall be determined on a case by case basis and at the minimum shall include any activity or development located:

- A. On a site immediately adjoining a sensitive area;
- B. A distance equal to or less than the greatest potential sensitive area buffer width and building setback applicable to the resource;
- C. A distance equal to or less than one-half mile (2,640 feet) from a bald eagle nest;
- D. A distance equal to or less than three hundred (300) feet upland from a stream, wetland, or water body;
- E. Bordering or within the floodway, floodplain or channel migration zone; or
- F. A distance equal to or less than two hundred (200) feet from a sensitive aquifer recharge area.

**19.10.602 *Advance mitigation*** – Mitigation of an anticipated sensitive area impact or hazard completed according to an approved sensitive area report and prior to site development.

***Agricultural activities*** – Agricultural uses and practices existing or legally allowed on the effective date of this ordinance on rural land or agricultural land designated under RCW 36.70A.170 including, but not limited to: Producing, breeding, or increasing agricultural products; rotating and

changing agricultural crops; allowing land used for agricultural activities to lie fallow in which it is plowed and tilled but left unseeded; allowing land used for agricultural activities to lie dormant as a result of adverse agricultural market conditions; allowing land used for agricultural activities to lie dormant because the land is enrolled in a local, state, or federal conservation program, or the land is subject to a conservation easement; conducting agricultural operations; maintaining, repairing, and replacing agricultural equipment; maintaining, repairing, and replacing agricultural facilities, when the replacement facility is no closer to a sensitive area than the original facility; and maintaining agricultural lands under production or cultivation

**19.10.603 *Alteration*** – Any human induced change on a site, or in the vicinity that alters the existing condition and/or ecological functions and values of a sensitive area or its buffer. Alterations include, but are not limited to grading, filling, channelizing, dredging, clearing (vegetation), construction, compaction, excavation, or any other activity that changes the character of the sensitive area.

**19.10.604 *Anadromous fish*** – Fish that spawn and rear in freshwater and mature in the marine environment.

**19.10.605 *Applicant*** – A person who files an application for permit under this chapter and who is either the owner of the land on which that proposed activity would be located, a contract purchaser, has a valid easement of other right to utilize, or is a public utility or public agency with the right of eminent domain, or is the authorized agent of such a person.

**19.10.606 *Aquifer, sole source*** – An area designated by the U.S. Environmental Protection Agency under the Safe Drinking Water Act of 1974, Section 1424(e). The aquifer(s) must supply fifty percent (50%) or more of the drinking water for an area without a sufficient replacement available.

**19.10.607 *Best available science*** – Current scientific information used in the process to designate, protect, or restore sensitive areas, that is derived from a valid scientific process as defined by WAC 365-195-900 through 925. Sources of best available science are included in Citations of Recommended Sources of the Best Available Science for Designating and Protecting Sensitive Areas published by the Washington State Office of Community Development.

**19.10.608 *Best management practices (BMPs)*** – Conservation practices or systems of practices and management measures that reflect the current scientific and technical consensus on the best or most effective means of addressing adverse effects upon a resource.

**19.10.609 *Buffer or buffer zone*** – An area that is contiguous to a sensitive

area and provides an area for related ecological functions to take place including, but not limited to, the continued maintenance, functioning, and/or structural stability of a sensitive area and/or separates and protects the sensitive area from adverse impacts associated with adjacent land uses.

**19.10.610 *Compensation project*** – Actions that are necessary to replace project-induced sensitive area and buffer losses, including land acquisition, planning, construction plans, monitoring, and contingency actions.

**19.10.611 *Compensatory mitigation*** – Replacing project-induced losses or impacts to a sensitive area, and includes, but is not limited to, the following:

**Restoration** – Actions performed to reestablish functional characteristics and processes that have been lost by alterations, activities, or catastrophic events within an area that no longer provides such functions.

**Creation** – Actions performed to intentionally establish functional characteristics of an ecosystem at a site where it did not formerly exist.

**Enhancement** – Actions performed to improve the condition of existing degraded ecological functions so that the functions they provide are of a higher quality.

**19.10.612 *Conservation easement*** – A legal agreement that the property owner enters into to restrict uses of the land. Such restrictions can include, but are not limited to, restrictions on use or specific facilities to protect resources such as water quality, wetland function, vegetation and habitat and may include passive recreation uses such as trails or scientific uses and may require specific measures to protect resources such as fences or other barriers. The easement is recorded on a property deed, runs with the land, and is legally binding on all present and future owners of the property, therefore, providing permanent or long-term protection.

**19.10.613 *Sensitive area tract*** – Land designated as a separate parcel and retained in an open condition in perpetuity for the protection of sensitive areas. Lands within this type of dedication may include sensitive areas and related buffers. Ownership may be vested in a private party, in undivided interest by lots in a subdivision, in a non-profit entity or a public entity.

**19.10.614 *Sensitive habitat***- Habitat areas with which endangered, threatened, sensitive or monitored plant, fish, or wildlife species have a primary association (e.g., feeding, breeding, rearing of young, migrating). Such areas are identified herein with reference to lists, categories, and definitions promulgated by the Washington Department of Fish and Wildlife as identified in WAC 232-12-011 or 232-12-014; in the Priority

Habitat and Species (PHS) program of the Department of Fish and Wildlife; or by rules and regulations adopted by the U.S. Fish and Wildlife Service, National Marine Fisheries Service, or other agency with jurisdiction for such designations.

**19.10.615 *Cumulative impacts or effects*** – The combined, incremental effects of human activity on ecological or sensitive areas functions and values. Cumulative impacts result when the effects of an action are added to or interact with other effects or actions in a particular place and within a particular time.

**19.10.616 *Developable area*** – A site or portion of a site that may be utilized as the location of development, in accordance with the rules of this chapter.

**19.10.617 *Development*** – Any activity upon the land consisting of construction or alteration of structures, earth movement, dredging, dumping, grading, filling, mining, removal of any sand, gravel, or minerals, driving of piles, drilling operations, bulkheading, clearing of vegetation, or other land disturbance. Development includes the storage or use of equipment or materials inconsistent with the existing use. Development also includes approvals issued by the city that binds land to specific patterns of use, including but not limited to, subdivisions, short subdivisions, zone changes, conditional use permits, and binding site plans. Development activity does not include the following activities:

- A. Interior building improvements.
- B. Exterior structure maintenance activities, including painting and roofing.
- C. Routine landscape maintenance of established, ornamental landscaping, such as lawn mowing, pruning and weeding.
- D. Maintenance of the following *existing* facilities that does not expand the affected area: septic tanks (routine cleaning); wells; individual utility service connections; and individual cemetery plots in established and approved cemeteries.

**19.10.618 *Development permit*** – Any permit issued by the [city/county], or other authorized agency, for construction, land use, or the alteration of land.

**19.10.619 *Erosion*** – The process whereby wind, rain, water, and other natural agents mobilize and transport particles.

**19.10.620 *Erosion hazard areas*** – At least those areas identified by the United State Department of Agriculture National Resources Conservation Service as have a “severe” rill and inter-rill erosion hazard.

**19.10.621 *Exotic*** – Any species of plants or animals, which are foreign to the planning area.

**19.10.622 *Fish habitat*** – Habitat that provides the life supporting and reproductive needs of a species or life stage of fish. Although the habitat requirements of a species depend on its age and activity, the basic components of fish habitat in rivers, streams, ponds, lakes, and nearshore areas include, but are not limited to, the following:

- A. Clean water and appropriate temperatures for spawning, rearing, and holding;
- B. Adequate water depth and velocity for migrating, spawning, rearing, and holding, including off-channel habitat;
- C. Abundance of bank and in-stream structures to provide hiding and resting areas and stabilize stream banks and beds;
- D. Appropriate substrates for spawning and embryonic development. For stream and lake dwelling fishes, substrates range from sands and gravel to rooted vegetation or submerged rocks and logs. Generally, substrates must be relatively stable and free of silts or fine sand;
- E. Presence of riparian vegetation that creates a transition zone, which provides shade, and food sources of aquatic and terrestrial insects for fish;
- F. Unimpeded passage (i.e. due to suitable gradient and lack of barriers) for upstream and downstream migrating juveniles and adults.

**19.10.623 *Flood or flooding*** – A general and temporary condition of partial or complete inundation of normally dry land areas from the overflow of inland waters and/or the unusual and rapid accumulation of runoff of surface waters from any source.

**19.10.624 *Floodplain*** – The total land area adjoining a river, stream, watercourse or lake subject to inundation by the base flood.

**19.10.625 *Formation*** – An assemblage of earth materials grouped together into a unit that is convenient for description or mapping.

**19.10.626 *Functions and values*** – Functions are processes or attributes provided by areas of the landscape (e.g. wetlands, rivers, streams, and riparian areas) The beneficial roles served by sensitive areas including, but are not limited to, water quality protection and enhancement, fish and wildlife habitat, food chain support, flood storage, conveyance and attenuation, ground water recharge and discharge, erosion control, wave attenuation, protection from hazards. Values are human perceptions of individual and social benefit associated with these functions and may include functional value for economic benefit, historical and archaeological value, aesthetic appreciation, educational, scientific, recreational or religious pursuits. These beneficial roles are not listed in order of priority.



**19.10.627 *Ground water*** – Water in a saturated zone or stratum beneath the surface of land or a surface water body.

**19.10.628 *Geologically Hazardous areas*** – Areas designated as geologically hazardous areas due to potential for erosion, landslide, seismic activity, mine collapse, or other geological condition.

**19.10.629 *Hazardous substances*** – Any liquid, solid, gas, or sludge, including any material, substance, product, commodity, or waste, regardless of quantity, that exhibits any of the physical, chemical or biological properties described in WAC 173-303-090 or 173-303-100.

**19.10.630 *Natural condition*** – Condition of the land, including flora, fauna, soil, topography, and hydrology that existed before the area and vicinity were developed or altered by human activity.

**19.10.631 *In-kind compensation*** – To replace sensitive areas with substitute areas whose characteristics and functions closely approximate those destroyed or degraded by a regulated activity. It does not mean replacement "in-category."

**19.10.632 *Isolated wetlands*** – Those wetlands that are outside of and not contiguous to any 100-year floodplain of a lake, river, or stream, and have no contiguous hydric soil or hydrophytic vegetation between the wetland and any surface water.

**19.10.633 *Infiltration*** – The downward entry of water into the immediate surface of soil.

**19.10.634 *Landslide hazard areas*** – Areas that are potentially subject to risk of mass movement due to a combination of geologic landslide resulting from a combination of geologic, topographic, and hydrologic factors. These areas are typically susceptible to landslides because of a combination of factors including: bedrock, soil, slope gradient, slope aspect, geologic structure, ground water, or other factors.

**19.10.635 *Monitoring*** – Evaluating the impacts of development proposals on the biological, hydrological, and geological elements of such systems and assessing the performance of required mitigation measures throughout the collection and analysis of data by various methods for the purpose of understanding and documenting changes in natural ecosystems and features, and includes gathering baseline data.

**19.10.636 *Native growth protection area (NGPA)*** – An area where native vegetation is preserved for the purpose of preserving ecological functions or preventing harm to property and the environment, including, but not limited to, controlling surface water runoff and erosion, maintaining slope stability, buffering and protecting plants and animal habitat;

**19.10.637 *Native vegetation*** – Plant species that are indigenous to the area in question.

**19.10.638 *Natural waters*** – Waters, excluding water conveyance systems that are artificially constructed and actively maintained for irrigation.

**19.10.639 *Non-indigenous*** – See “exotic.”

**19.10.640 *Nonconforming*** –A use, development, structure or parcel that was lawfully constructed or established prior to the effective date of this code or amendments hereto, but which does not conform to present regulations or standards. For purposes of this code, a nonconforming parcel or lot shall be a single family residential lots within a subdivision filed within five years previous to the adoption of provisions of this code that render them non-conforming in compliance with RCW 58.17.17, or any other lots or parcels under contiguous ownership.

**19.10.641 *Off-site compensation*** – To replace sensitive areas away from the site on which a sensitive area has been impacted.

**19.10.642 *On-site compensation*** – To replace sensitive areas at or adjacent to the site on which a sensitive areas has been impacted.

**19.10.643 *Out-of-kind compensation*** – To replace sensitive areas with substitute sensitive areas whose characteristics do not closely approximate those destroyed or degraded. It does not refer to replacement "out-of-category."

**19.10.644 *Practical alternative*** – An alternative that is available and capable of being carried out after taking into consideration, cost, existing technology, and logistics in light of overall project purposes, and having fewer impacts to sensitive areas.

**19.10.645 *Primary association area*** – The area used on a regular basis by, or is in close association with, or is necessary for the proper functioning of the habitat of a sensitive species. Regular basis means that the habitat area is normally, or usually known to contain a sensitive species, or based on known habitat requirements of the species, the area is likely to contain the sensitive species. Regular basis is species and population dependent. Species that exist in low numbers may be present infrequently yet rely on certain habitat types.

**19.10.646 *Priority habitat*** – Habitat type or elements with unique or significant value to one or more species as classified by the Department of Fish and Wildlife. A priority habitat may consist of a unique vegetation type or dominant plant species, a described successional stage, or a specific structural element (WAC 173-26-020(34)).

**19.10.647 *Project area*** – The area proposed to be disturbed, altered, or used by the proposed activity or the construction of any proposed structures. When the action binds the land, such as a subdivision, short subdivision, binding site plan, planned unit development, or rezone, the project area shall include the entire contiguous parcel owned or controlled

by the applicant, at a minimum.

**19.10.648 *Qualified professional*** – A person with experience and training in the pertinent scientific discipline, and who is a qualified scientific expert with expertise appropriate for the relevant sensitive area subject in accordance with WAC 365-195-905(4). A qualified professional must have obtained a B.S. or B.A. or equivalent degree in the relevant field, and two years of related work experience.

- A. A qualified professional for terrestrial or aquatic habitats must have a degree in biology and professional experience related to the subject species.
- B. A qualified professional for wetlands must have a degree in biology and professional experience related to wetlands and have passed a certification course.
- C. A qualified professional for a geological hazard must be a professional engineer or geologist, licensed in the state of Washington.
- D. A qualified professional for sensitive aquifer recharge areas means a hydrogeologist, geologist, engineer, or other scientist with experience in preparing hydrogeologic assessments.

**19.10.649 *Recharge*** – The process involved in the absorption and addition of water to ground water.

**19.10.650 *Relatively density*** – A method for evaluating the density of trees in relation to the theoretical maximum density for trees of the same size and species. It is preferable to a simple density (trees/acre) because it is a more accurate measure of occupied growing space and suppression mortality. Relative density equals the basal area of all trees in the stand divided by the square root of the quadratic mean diameter.

**19.10.651 *Repair or maintenance*** – An activity that restores the character, scope, size, and design of a serviceable area, structure, or land use to its previously authorized and undamaged condition. Activities that change the character, size, or scope of a project beyond the original design and drain, dredge, fill, flood, or otherwise alter sensitive areas are not included in this definition.

**19.10.652 *Restoration*** – Measures taken to restore an altered or damaged natural feature including:

- A. Active steps taken to restore damaged or altered ecological conditions, wetlands, streams, protected habitat, or their buffers to the functioning condition that existed prior to an unauthorized alteration; and
- B. Actions performed to reestablish structural and functional characteristics of the sensitive area that have been lost by

alteration, past management activities, or catastrophic events.

**19.10.653 Riparian habitat** – Areas adjacent to aquatic systems (stream, lake or pond) that contain elements of both aquatic and terrestrial ecosystems that mutually influence each other. Riparian areas include those portions of terrestrial ecosystems that significantly influence exchanges of energy and matter with aquatic ecosystems (i.e., zone of influence). The width of these areas extends to that portion of the terrestrial landscape that directly influences the aquatic ecosystem by providing shade, fine or large woody material, nutrients, organic and inorganic debris, terrestrial insects, or habitat for riparian-associated wildlife. Riparian habitat areas include those riparian areas altered due to human development activities.

**19.10.654 River** – See “Watercourse”

**19.10.655 Scientific process** – A valid scientific process is one that produces reliable information useful in understanding the consequences of a decision. The characteristics of a valid scientific process are as follows:

- A. **Peer review.** The information has been sensitively reviewed by other qualified scientific experts in that scientific discipline.
- B. **Methods.** The methods that were used are standardized in the pertinent scientific discipline or the methods have been appropriately peer-reviewed to assure their reliability and validity.
- C. **Logical conclusions and reasonable inferences.** The conclusions presented are based on reasonable assumptions supported by other studies and are logically and reasonably derived from the assumptions and supported by the data presented.
- D. **Quantitative analysis.** The data have been analyzed using appropriate statistical or quantitative methods.
- E. **Context.** The assumptions, analytical techniques, data, and conclusions are appropriately framed with respect to the prevailing body of pertinent scientific knowledge.
- F. **References.** The assumptions, techniques, and conclusions are well referenced with citations to pertinent existing information.

**19.10.656 Seismic hazard areas** – Areas that are subject to severe risk of damage as a result of earthquake-induced ground shaking, slope failure, settlement, or soil liquefaction.

**19.10.657 SEPA** – Washington State Environmental Policy Act, Chapter 43.21C RCW.

**19.10.658 Shorelands or shoreland areas** – Those lands extending landward for two hundred feet (200 ft) in all directions as measured on a

horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward two hundred (200) feet from such floodways; and all wetlands and river deltas associated with the streams, lakes and tidal waters which are subject to the provisions of Chapter 90.58 RCW.

**19.10.659 *Soil survey*** – The most recent soil survey for the local area or county by the National Resources Conservation Service, U.S. Department of Agriculture.

**19.10.660 *Species*** – Any group of animals classified as a species or subspecies as commonly accepted by the scientific community.

**19.10.661 *Species, endangered*** – Any fish or wildlife species that is threatened with extinction throughout all or a significant portion of its range and is listed by the state or federal government as an endangered species.

**19.10.662 *Species of local importance*** – Those species of local concern due to their population status or their sensitivity to habitat manipulation, or that are game species.

**19.10.663 *Species, priority*** – Any fish or wildlife species requiring protective measures and/or management guidelines to ensure their persistence as genetically viable population levels as classified by the Department of Fish and Wildlife, including endangered, threatened, sensitive, candidate and monitor species, and those of recreational, commercial, or tribal importance.

**19.10.664 *Species, threatened*** – Any fish or wildlife species that is likely to become an endangered species within the foreseeable future throughout a significant portion of its range without cooperative management or removal of threats, and is listed by the state or federal government as a threatened species.

**19.10.665 *Stream*** – See “Watercourse.”

**19.10.666 *Sub-drainage basin or subbasin*** – The drainage area of the highest order stream containing the subject property impact area. Stream order is the term used to define the position of a stream in the hierarchy of tributaries in the watershed. The smallest streams are the highest order (first order) tributaries. These are the upper watershed streams and have no tributaries of their own. When two first order streams meet, they form a second order stream, and when two second order streams meet they become a third order stream, and so on.

**19.10.667 *Unavoidable*** – Adverse impacts that remain after all appropriate and practicable avoidance and minimization have been achieved.

**19.10.668 *Water dependent*** – A use or portion of a use that cannot exist in

a location that is not adjacent to the water, but is dependent on the water by reason of the intrinsic nature of its operations. A use that can be carried out only on, in, or adjacent to water. Examples of water dependent uses include ship cargo terminal loading areas; fishing; ferry and passenger terminals; barge loading, ship building, and dry docking facilities; marinas, moorage, and boat launching facilities; aquaculture; float plane operations; surface water intake; and sanitary sewer and storm drain outfalls.

**19.10.669 *Water resource inventory area (WRIA)*** – One of sixty-two (62) watersheds in the state of Washington, each composed of the drainage areas of a stream or streams, as established in Chapter 173-500 WAC on January 1, 1997, as amended hereafter.

**19.10.670 *Water table*** – That surface in an unconfined aquifer at which the pressure is atmospheric. It is defined by the levels at which water stands in wells that penetrate the aquifer just far enough to hold standing water.

**19.10.671 *Watercourse*** – Those areas where surface waters produce a defined channel or bed. A defined channel or bed is an area that demonstrates clear evidence of the annual passage of water and includes, but is not limited to, bedrock channels, gravel beds, sand and silt beds, and defined-channel swales. The channel or bed need not contain water year-round. This definition includes drainage ditches or other artificial water courses where natural streams existed prior to human alteration, and/or the waterway is used by anadromous or resident salmonid or other fish populations.

**19.10.672 *Well*** – A bored, drilled or driven shaft, or a dug hole whose depth is greater than the largest surface dimension for the purpose of withdrawing or injecting water or other liquids.

**19.10.672 *Wetlands*** – Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from non-wetland areas to mitigate the conversion of wetlands. For identifying and delineating a wetland, local government shall use the Washington State Wetland Identification and Delineation Manual.

**19.10.674 Wetland edge** – The boundary of a wetland as delineated based on the definitions contained in this chapter.

SECTION 3 The Black Diamond Shoreline Master Program is amended to adopt these provisions in whole as a part of this Program, except that the permit, non-conforming use, appeal and enforcement provisions of the Sensitive Areas Ordinance shall not apply within shoreline jurisdiction.

SECTION 4. This Ordinance shall be in full force and effect five days after its passage, approval, posting and publication as provided by law. A summary of this Ordinance may be published in lieu of publishing the Ordinance in its entirety.

SECTION 5. If any provision of this Ordinance is determined to be invalid or unenforceable for any reason, the remaining provisions of this Ordinance shall remain in force and effect.

Introduced the \_\_\_ day of September, 2008.

Passed by a majority of the City Council at a meeting held on the \_\_\_\_\_ day of , 2008.

\_\_\_\_\_  
Mayor Howard Botts

Attest:

\_\_\_\_\_  
Brenda Streepy, City Clerk

APPROVED AS TO FORM:

\_\_\_\_\_  
Loren D. Combs, City Attorney

Published: \_\_\_\_\_

Posted: \_\_\_\_\_

Effective Date: \_\_\_\_\_

## EXHIBIT A

### FINDINGS OF FACT

#### A. General Sensitive Areas Findings

1. The Growth Management Act requires the adoption of development regulations that protect sensitive areas designated in accordance with RCW 36.70A.170.
2. RCW 36.70A.172 requires local governments to give special consideration to the conservation and protection measures necessary to preserve or enhance anadromous fisheries.
3. Development may result in cumulative impacts to those functions and values of sensitive areas that contribute to and are necessary for a healthy natural environment and perceived quality of life.
4. The development of residences, businesses, shopping areas and other structures, and the clearing of land for accommodation of livestock and for such development all have the potential of adversely and significantly impacting the functions and values of sensitive areas.
5. The unwise development of resource lands or areas susceptible to natural hazards may lead to inefficient use of limited public resources, jeopardize environmental resource functions and values, subject persons and property to unsafe conditions, and affect the perceived quality of life.
6. It is more costly to remedy the loss of sensitive area functions and values than to conserve and protect them from loss or degradation.
7. In determining what sensitive areas are to be afforded a particular degree of protection, the City of Black Diamond has evaluated a wide range of the best science available with respect to the sensitive areas to make informed decisions that meet the intent of the Growth Management Act and that are also reflective of local needs. The sources of this best available science that were evaluated and included in this ordinance include the following:

*August xx, 2008 Washington State Wetland Identification and Delineation Manual, (Ecology Publication #96-94 1997).*

*Washington State Wetland Rating System for Western Washington, (Ecology Publication #04-06-025).*

*Wetland Mitigation in Washington State – Part 2: Guidelines*



*for Developing Wetland Mitigation Plans and Proposals*, April 2004 (Ecology Publication #04-06-013b).

Appendix 8-B *Wetland Language in a Sensitive Areas Ordinance* (April 2005).

Appendix 8-C *Guidance on Buffers and Ratios—Western Washington* (April 2005).

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

*Sensitive Areas Assistance Handbook* (CTED November 2003).

Appendix A, Example Code Provisions for Designating and Protecting Sensitive Areas.

*Management Recommendations for Washington's Priority Habitats: Riparian*, Washington Department of Fish and Wildlife, 1997.

U.S. Geological Survey landslide hazard, seismic hazard, and volcano hazard maps.

Washington State Department of Natural Resources seismic hazard maps for Western Washington.

Washington State Department of Natural Resources slope stability maps.

Black Diamond Sensitive Areas Map.

8. Protection standards for one sensitive area often provide protection for one or more other sensitive areas.
9. Sensitive areas may also be protected by other actions by the City of Black Diamond, such as stormwater management standards, sensitive area restoration, and public education; and from other regulations, such as the Forest Practices Act, the Shoreline Management Act, and the State Environmental Policy Act.

## **B. Wetlands**

1. Wetlands and streams are environmentally sensitive and serve numerous natural functions and values. These functions include: wildlife and fisheries habitat; water quality protection; flood protection; shoreline stabilization; stream flow; and ground water recharge and discharge. In many

situations, these functions cannot be adequately replicated or replaced.

2. The scientific literature supports in the inclusion of protective buffers from wetlands to provide sediment control and nutrient inputs to wetlands, and to protect important wetland functions.
3. Wetlands are identified and rated according to the Washington State Wetland Identification and Delineation Manual and Washington State Wetland Rating System Western Washington, prepared by the Washington State Department of Ecology (Ecology).
4. The scientific literature supports protective buffers ranging from 25 to 300 feet of relatively intact native vegetation to adequately protect wetland functions and values.
5. Appropriate wetland mitigation ratios – ratios of areas of wetland replacement and enhancement to that altered or destroyed – are established in Wetland Mitigation Replacement Ratios: Defining Equivalency, published by Ecology, 1992.

### **C. Fish and Wildlife Habitat Conservation Areas**

1. Fish and wildlife habitat conservation areas perform many important physical and biological functions that benefit the [jurisdiction] and its residents, including but not limited to: maintaining species diversity and genetic diversity; providing opportunities for food, cover, nesting, breeding and movement for fish and wildlife; serving as areas for recreation, education and scientific study and aesthetic appreciation; helping to maintain air and water quality; controlling erosion; and providing neighborhood separation and visual diversity within urban areas.
2. Wetlands and streams are environmentally sensitive and serve numerous natural functions and values. These functions include: wildlife and fisheries habitat; water quality protection; flood protection; shoreline stabilization; stream flow; and ground water recharge and discharge. In many situations these functions cannot be adequately replicated or replaced.
3. The scientific literature supports in the inclusion of protective buffers from streams to provide sediment control, nutrient inputs to downstream waters, large woody debris, and other functions important to riparian areas.
4. The Washington Department of Fish and Wildlife (WDFW) has prepared management recommendations for the preservation of priority habitat and species, which are based on

the best available science, and include, in some instances, recommended protective buffer distances.

5. Salmonid and anadromous fish may be more impacted by development and human activity during some times than others. Such times are referred to as “fish windows,” which have been documented by WDFW.
6. DNR has classified watercourses according to a stream-typing system based on channel width, fish use, and perennial or intermittent status.
7. WAC 365-190-080(5) grants the City of Black Diamond the flexibility to make decisions in the context of local circumstances, and specifically excuses local jurisdictions from being required to protect “all individuals of all species at all time.”

#### **D. Geologically Hazardous Areas**

1. Geologically hazardous areas are subject to periodic geological events that result in loss of life and property, health, and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.
2. Geologic hazards may be exacerbated by development and human activity in sensitive areas, and impacts resulting from geologic hazards may be reduced by limiting development and human activity within or adjacent to the geologic hazard.
3. Some geologic hazards may be intensified during periods of consistent or heavy rainfall that results in ground saturation or surface water drainage flows.

# City of Black Diamond Sensitive Areas Ordinance

*Best Available Science Review and  
Recommendations for Code Update*

## Summary and Recommendations

*Prepared for*

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## ACRONYMS

BAS	Best Available Science
BDMC	Black Diamond Municipal Code
BMPs	best management practices
CAO	critical areas ordinance
CARAs	critical aquifer recharge areas
CMZ	channel migration zone
CTED	Washington State Office of Community Trade and Economic Development
DNR	Department of Natural Resources
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FEMA	Federal Emergency Management Agency
FWHCAs	fish and wildlife habitat conservation areas
GIS	Geographic Information System
GMA	Growth Management Act
LWD	large woody debris
NMFS	National Marine Fisheries Service
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
PHS	Priority Habitat and Species
SASSI	Washington State salmon and steelhead stock inventory
SMA	Shoreline Management Act
SMP	Shoreline Master Program
SPTH	site-potential tree height
SWPPP	Stormwater Pollution Prevention Plan
TES	threatened, endangered, or sensitive
TIA	total impervious surface
UGAs	Urban Growth Areas
USFWS	United States Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WHPAs	Wellhead protection areas
WRIA	Water Resource Inventory Area



## 1. SUMMARY OF FINDINGS

This report summarizes the findings in the City of Black Diamond Sensitive Areas Best Available Science Studies prepared for the City by Parametrix Inc. in September 2008.

The general findings are:

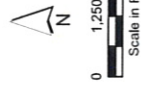
- The City of Black Diamond and its Urban Growth Area (UGA) include most of the Lake Sawyer watershed.
- Lake Sawyer is a particularly sensitive and fragile lake because of its large area and relatively small watershed. In the past, the lake has been adversely impacted by nutrient loading. The lake is vulnerable to degradation as a result of urbanization.
- A landscape analysis of a variety of factors affecting ecological functions has identified the large stream wetland complexes of the Rock Creek, Jones Lake/Jones Creek and Black Diamond Lake/Black Diamond Creek as the areas within the UGA with the most intensive concentration of ecological processes that positively contribute to water quality of Lake Sawyer.
- Other streams and wetlands play an important part in ecological processes, but since most of them flow into the Rock Creek, Jones Lake/Jones Creek and Black Diamond Lake/Black Diamond Creek, their role is subsidiary.
- The Rock Creek, Jones Lake/Jones Creek and Black Diamond Lake/Black Diamond Creek area also provides the most productive aquatic and terrestrial wildlife habitats in the UGA with the most intensive concentration of ecological processes that positively contribute to water quality of Lake Sawyer.
- The City of Black Diamond and its Urban Growth Area (UGA) is a small part of, and a relatively small contributor to the ecological functions and values of the larger Green River watershed and the smaller Soos Creek and Covington Creek subbasins in which it is primarily located.
- Geologically hazardous areas (including coal mine hazards) and critical aquifer recharge areas are a concern, but can largely be addressed on a case-by-case basis.

The recommendations for management of Sensitive Areas in City of Black Diamond and its Urban Growth Area are:

- The City should focus protection on the areas with the most important ecological functions - the “core” stream and wetland complexes of the Rock Creek, Jones Lake/Jones Creek and Black Diamond Lake/Black Diamond Creek and provide those areas with the greatest protection indicated as the “Core” area in Figure I-1.
- The second priority in preservation should be the wetland complexes at the headwaters of Ginder Creek, Lawson Creek and other tributaries that provide an important water supply to the larger system.
- Other streams and wetlands in the area provide important ecological functions and should be protected.

Some flexibility can be provided in development regulations to areas other than the core stream and wetland complexes of the Rock Creek, Jones Lake/Jones Creek and Black Diamond Lake/Black Diamond Creek. Regulations that allow reduction of buffer areas by transferring buffers to the areas providing a greater complex of ecological functions are especially appropriate.

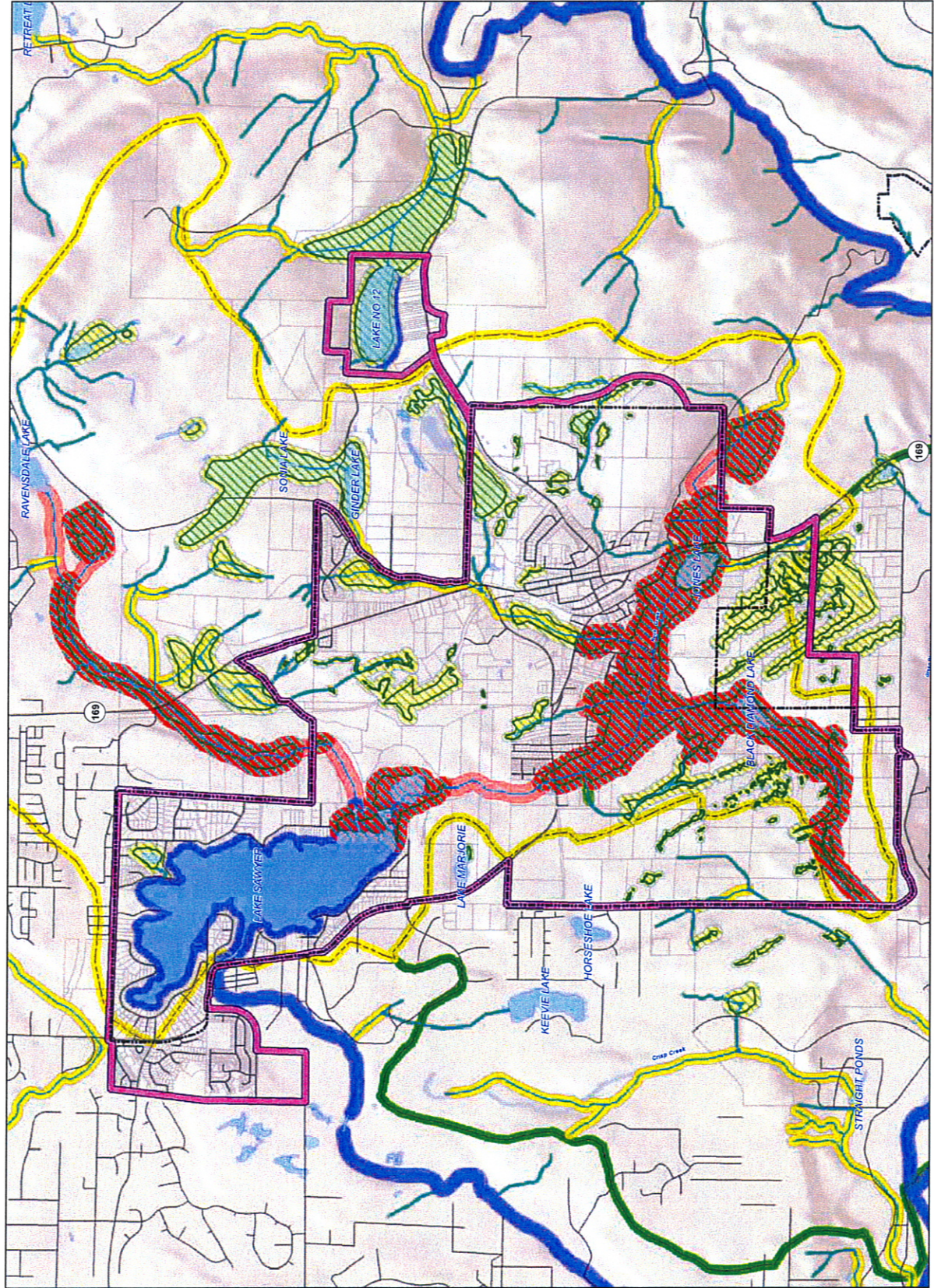
**Parametrix**



- Legend**
- Black Diamond City Limits
  - UGA Boundary
  - SR 169
  - Road
  - Water Body
  - WADNR Streams
  - CAO Wetland boundaries
  - Wetland Buffer Alternative C
  - Category and Buffer Distance
  - Headwaters - 225 ft
  - CORE - 225 ft
  - I - 180 ft
  - II - 150 ft
  - III - 80 ft
  - IV - 50 ft
  - Stream Buffer Alternative C
  - Category and Buffer Distance
  - CORE - 225 ft
  - S - 200 ft
  - F - 150 ft
  - Np, Ns - 100 ft
  - Study Area
  - Lake Sawyer Watershed
  - Green River Watershed

**Figure 1-1**  
**Core Area**  
**Most Intensive Processes**  
**Black Diamond UGA**

Critical Area Ordinance Update  
 City of Black Diamond, WA



## 2. BEST AVAILABLE SCIENCE

### 2.1 WHAT IS BEST AVAILABLE SCIENCE

As defined in Washington Administrative Code (WAC) 365-195-905, Best Available Science (BAS) means current scientific information derived from research, monitoring, inventory, survey, modeling, assessment, synthesis, and expert opinion that is:

- Logical and reasonable
- Based on quantitative analysis
- Peer reviewed
- Used in the appropriate context
- Based on accepted methods
- Well referenced.

In some instances the GMA and its regulations constrain the choice of science that can be used to designate or protect a particular resource (e.g., local governments are required to use the definition of wetlands found in RCW 36.70A.030.21). In other cases, there may be a range of options that are supported by science (e.g., wetland buffer widths necessary to protect functions).

The State legislature and the Growth Management Hearings Boards have defined critical area “protection” to mean preservation of critical area “structure, function, and value.” Local governments are not required to protect all functions and values of all critical areas, but are required to achieve “no net loss” of critical area functions and values across the jurisdictional landscape. Local governments are also required to develop regulations that reduce hazards associated with some types of critical areas, including geologically hazardous areas and frequently flooded areas. The standard of protection is to prevent adverse impacts to critical areas, to mitigate adverse impacts, and/or reduce risks associated with hazard areas.

This document and the Technical Appendixes that accompany it provide a summary of scientific studies related to designating and protecting critical areas, including habitat for anadromous fish species, as defined by the GMA. The information provides a basis for recommended changes and additions to the City of Black Diamond critical areas regulations in Ordinance 474 adopted in 1993. It is not intended to provide an exhaustive summary of all science available for all critical areas. The information reviewed is pertinent to City of Black Diamond, applicable to the types of critical areas present, and is believed to be the best available scientific information.

### 2.2 HOW IS THIS REPORT ORGANIZED

The analysis of Critical Areas in Black Diamond focused on ecological functions of wetlands, streams, habitat and aquifers and the hazards associated with geologic feature and, abandoned coal mines. The ecological analysis included two levels:

- The planning context, including state statutes and county and local plans
- A Landscape analysis that looked at ecological functions on a sub-watershed scale and addresses two main questions:
  - Which geographic areas are important for key ecological processes?

- What human activities in the important areas have altered or may later the key processes?
- A topical analysis of each of the resources within the Urban Growth Area, including streams, wetlands with their related habitat functions, frequently flooded areas, critical aquifer recharge areas, and geologic hazards, including coal mines. Each topical analysis assesses regulatory options for each resource.

This report summarizes more detailed analysis in Technical Appendixes that address specific resources:

- Technical Appendix A, Best Available Science Review and Recommendations for Code Update, Landscape Analysis
- Technical Appendix B, Best Available Science Review and Recommendations for Code Update, Fish and Aquatic Species, Terrestrial Habitat, Wetlands, Frequently Flooded Areas
- Technical Appendix C, Best Available Science Review and Recommendations for Code Update, Geologically Hazardous Areas, Critical Aquifer Recharge Areas

## **3. PLANNING CONTEXT**

### **3.1 STATUTORY MANDATE**

In 1995, the Washington State legislature amended the Growth Management Act (GMA) to require that local governments include Best Available Science (BAS) in designating and protecting critical areas (RCW § 36.70A.172(1)). In 2000, the state's Office of Community Trade and Economic Development (CTED) adopted procedural criteria to implement these changes to the GMA and provided guidance for identifying BAS (CTED 2004).

This document summarizes BAS for City of Black Diamond sensitive areas and provides recommendations for updating the City's sensitive areas ordinance (CAO).

As directed by RCW 36.70A.050, this document addresses the following critical areas which are referred to in the Black Diamond Code as "sensitive areas":

- Fish and wildlife habitat conservation areas (HCAs).
- Wetlands (both freshwater and estuarine);
- Geologically hazardous areas;
- Frequently flooded areas; and
- Critical aquifer recharge areas (CARAs).

### **3.2 RELATIONSHIP TO OTHER PLANNING EFFORTS**

The recommendations derived from the BAS review will be used as the basis for revising the City's development regulations and Sensitive Areas ordinances. The City is required to integrate sensitive areas protection into zoning regulations, clearing and grading provisions, stormwater management requirements, subdivision regulations and other applicable plans and policies. The City is also required to integrate the CAO provisions with its Shoreline Master Program (SMP). To comply with House Bill 1933, SMP regulations pertaining to critical areas must be as protective or more protective of functions and values as the CAO regulations themselves.

### 3.3 CITY SETTING

The City of Black Diamond is located in central western Washington State and encompasses approximately 5.9 square miles with a population of 4,120 (Figure 3-1, Vicinity Map). The Green River Valley lines the City to the south and east, and the City of Maple Valley is located to the north. The western edge of the City and UGA south of Lake Sawyer is generally along the alignment of 228th Avenue SE.

The vast majority of the City of Black Diamond's Urban Growth Area (UGA) is located in the Green/Duwamish River watershed (WRIA 9). Within the Green River watershed, the city drains into two distinct sub-basins:

- The Lower Green River/Soos Creek/Covington Creed subbasin, of which the Lake Sawyer sub-basin is part.
- The Middle Green River/Crisp Creek sub-basin.
- With the exception of two small portions of the UGA streams in the City drain to the Lake Sawyer/Covington Creek ("Lake Sawyer") subwatershed. Mapped streams located in the City include Covington Creek, Rock Creek, Ginder Creek, Black Diamond Lake Creek, Lawson Creek, Ravensdale Creek, and Jones Lake Creek. Rock Creek and Ravensdale Creek are the two primary tributaries to Lake Sawyer; Covington Creek, only a small portion of which is located in the City, is the only outlet for the lake. Several of the aforementioned streams support anadromous species.

A small portions of Green River/Crisp Creek sub-basin also is located in the city's UGA. (Figure 3-2). The portions of this basin located in the City do not have mapped streams and do not support anadromous species.

Lake 12 to the northeast of the current city limits is within the UGA and provides the headwaters of a separate stream named Rock Creek which drains into the Cedar River. To prevent confusion, this stream is referred to as the "Cedar River tributary Rock Creek."

Black Diamond is located at the edge of the King County Urban Growth Boundary. The City and King County have an existing agreement (the Black Diamond Urban Growth Area Agreement) that outlines a mutually acceptable Urban Growth Area boundary for the City of Black Diamond and conditions under which these areas may be annexed into the City. The UGA Agreement covers 792 acres of land. Following annexation, 593 of these acres can be developed and 189 acres would be preserved as open space. The area involved in the agreement is also referred to as the Potential Annexation Area (PAA) to distinguish them from the Lake Sawyer and Black Diamond Lake areas, also in the City's UGA (Figure 3-3).

### 3.4 COMPREHENSIVE PLAN

The City of Black Diamond adopted its current Comprehensive Plan in 1996. The City is currently updating that plan and issued a draft in March 2008 which is expected to be adopted in late 2008 (Figure 3-4 and Figure 3-5).

#### 3.4.1 King County, Countywide Planning Policies

The City's Comprehensive Plan must be consistent with the King County Countywide Planning Policies (CCP) that provide the basis for designating Urban Growth Areas (UGA) throughout the county. King County policies provide specific policies that recognize the particular setting and challenges of rural communities. Specific relevant policies include:

- **King County CCP LU-38.** In recognition that cities in the rural area are generally not contiguous to the countywide Urban Growth Area, and to protect and enhance the options cities in rural areas provide, these cities shall be located within Urban Growth Areas. These Urban Growth Areas generally will be islands separate from the larger Urban Growth Area located in the western portion of the county. Each city in the Rural Area and King County and the Growth Management Planning Council shall work cooperatively to establish an Urban Growth Area for that city.

### 3.4.2 Black Diamond Urban Growth Area Agreement

In 2005 the City, the County, the Cascade Land Conservancy, and Plum Creek Timber Co. entered into the “Black Diamond Urban Growth Area Agreement” that established urban growth boundaries and specific conditions for annexation to the City to proceed.

The UGA Agreement is guided by four main goals:

- Protect the Rock Creek /Lake Sawyer Watershed and the Rock Creek/Lake 12 Basin
- Protect and maintain the community character
- Provide a healthy jobs-housing mix
- Make efficient development a priority

The Open Space component of the Urban Areas Agreement is shown in Figure 3-3.

### 3.4.3 Black Diamond Draft Comprehensive Plan

The March 2008 Comprehensive Plan Draft establishes the basis for land use within the city, as shown in Figure 3-4.

The plan has a number of policies relevant to sensitive areas and other ecological functions in the city. The most important of these include:

#### Critical Areas

**UGA Policy NE 6:** Naturally occurring processes such as runoff, stream channel migration, should be maintained by designing stream crossings to pass floods and debris, as well as fish.

**UGA Policy NE 7:** Development of headwater catchments should be limited to protect streams from temperature increases, sediment, and fish habitat degradation.

**UGA Policy NE 8:** Where linkages between habitats have been severed or interrupted, connections should be restored by replacing culverts with bridges, revegetating riparian areas, and improving in stream habitat.

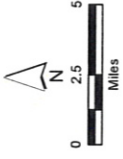
**UGA Policy NE 9:** Developed portions of all annexation areas, especially in the Lake 12 Annexation Area, should protect the maximum amount of native vegetation to enhance storm water management.

**UGA Policy NE 10:** New residential development in the Lake 12 Annexation Area should be sited and clustered away from the adjacent rural and resource, or critical areas.

**UGA Policy NE 11:** Coordinate with King County and the Muckleshoot Indian Tribe to develop management plans that preserve County Open Space identified in the UGA Agreement primarily for its open space values, as opposed to timber values.

**UGA Policy NE 12:** Mitigation measures identified in the City of Black Diamond Potential Annexation Area Final Environmental Impact Statement and Comprehensive Plan Amendments should be used, with other city requirements, as development standards for the UGA.

Parametrix



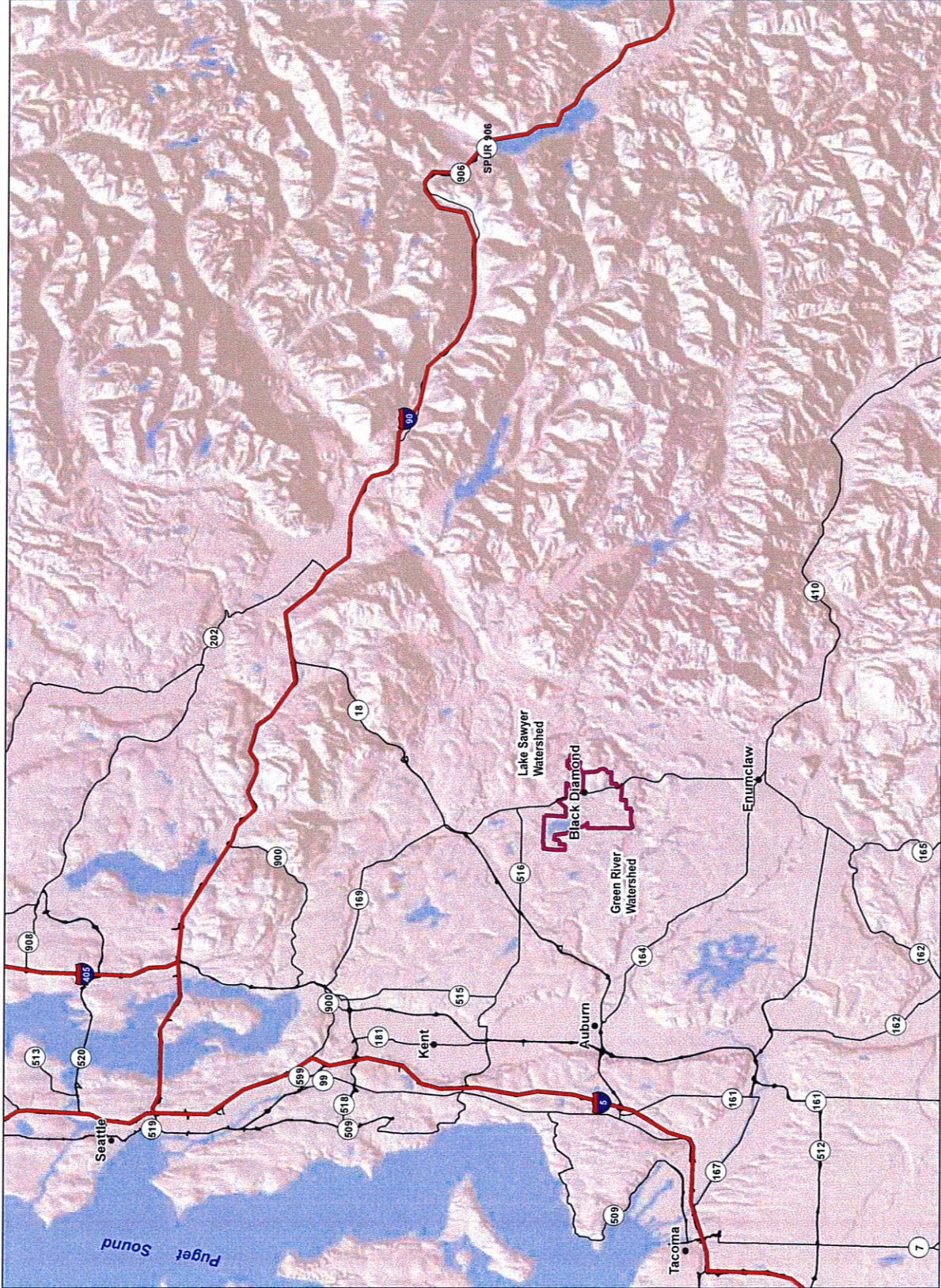
Legend

- Black Diamond
- UGA Boundary

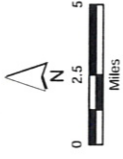
Data Source: King County GIS

Figure 3-1  
Vicinity Map

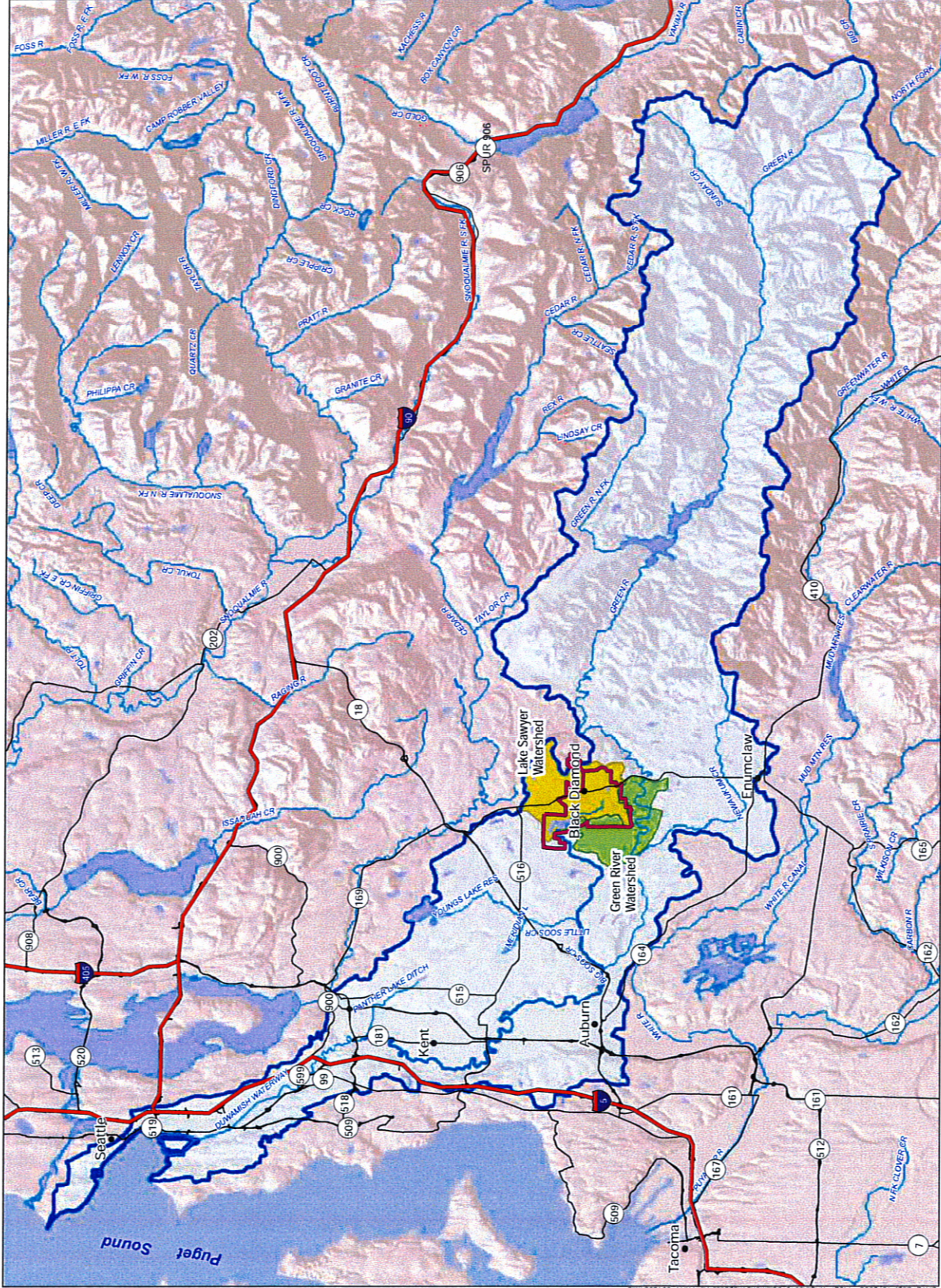
Sensitive Area Ordinance Update  
City of Black Diamond, WA



DATE: Sept 18, 2008 FILE: K:\913043\blsmonr\maddox\kvc\_1117\_091808.mxd



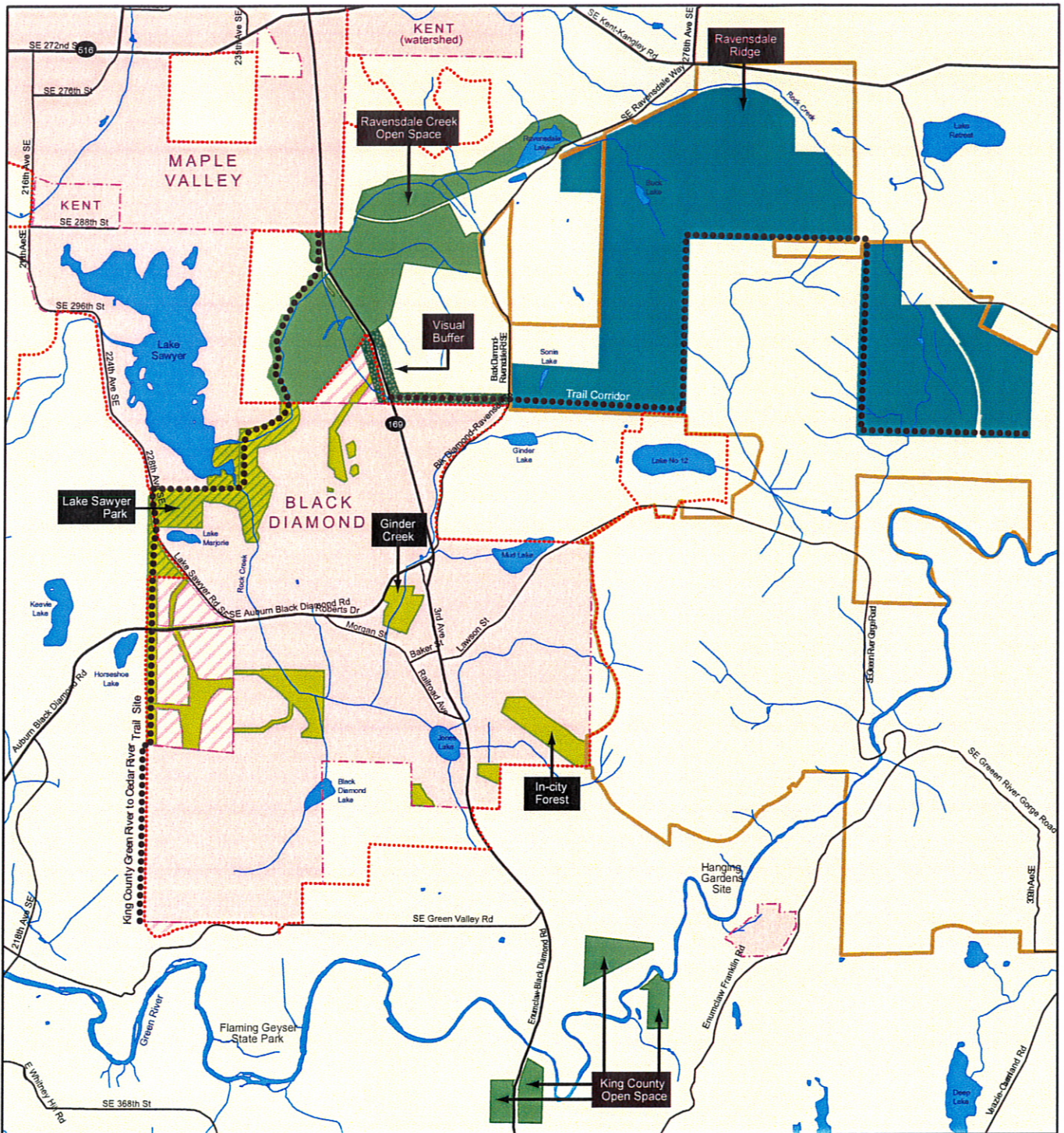
- Legend**
- Duwamish - Green River Watershed
  - Black Diamond UGA Boundary
  - Lake Sawyer Watershed
  - Green River Watershed



Date: Source: King County GIS, WA DNR

Figure 3-2  
Vicinity Watersheds





Parametrix 217-3043-004/01(01) 8/08 (B)

- Black Diamond Open Space
- King County Open Space
- Conserved Forest Land
- Visual Buffer
- Lake Sawyer Park
- Streams
- Minor Road
- Major Road
- Future Trail Site
- Lake
- Incorporated Area
- Annexation Area
- Urban Growth Area Line
- Forest Production District Boundary

Data Sources:  
 Standard King County datasets: lakes, rivers/streams, urban growth area line, forest production district.  
 Custom King County GIS Center datasets: in-city forest, annexation areas, King County open space, trails.  
 ESM Consulting Engineers, LLC (2005): In-City Open Space/Forest, Ginder Cr. Open Space, Section 2 Visual Buffer.

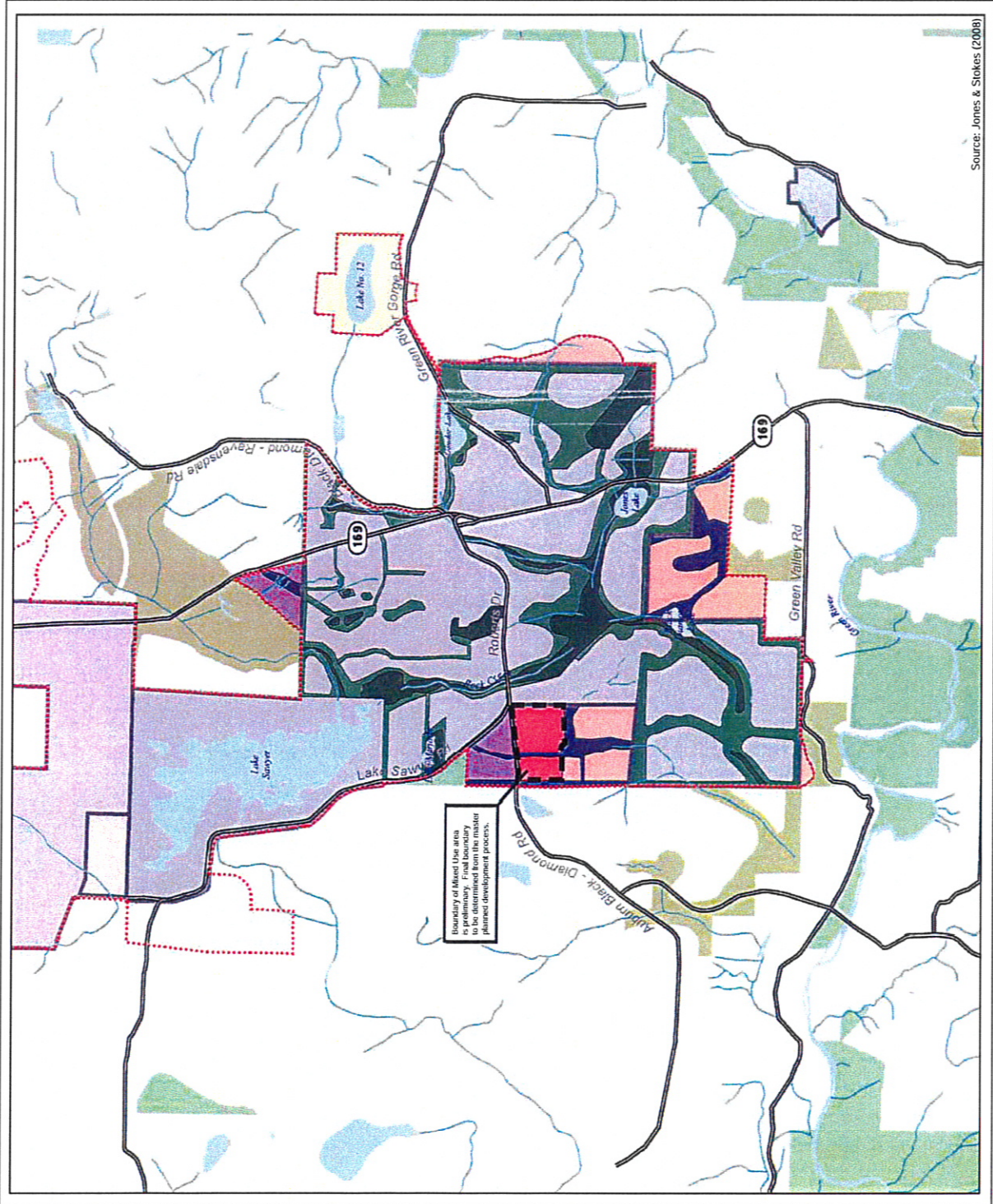
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 GIS Data Files (WLRD GIS Archives):  
 DNRP1/Projects/WLRD/050605



**Figure 3-3**  
**Black Diamond**  
**Urban Growth**  
**Area Agreement,**  
**Open Space**



**Legend**

**UGA Land Use**

- UGA Open Space
- Low Density Residential
- Medium Density Residential
- Mixed Use
- Business Park & Light Industrial

**In City Open Space**

- Primary
- Secondary

- King County Open Space
- UGA County Open Space

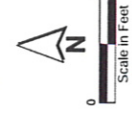
**City**

- Black Diamond
- Kent
- Maple Valley

**Water Body**

- UGA Boundary
- Stream
- Arterial

Note: UGA Land Use approved by Black Diamond Ordinance No. 723 on 12/6/2001.



Boundary of Mixed Use area shown in red. This area is to be determined from the future planned development process.

Figure 3-4  
Black Diamond Comprehensive Plan,  
Land Use and Open Space



## Land Use

**UGA Objective LU 1:** Accommodate projected growth, protect the critical drainage areas from inappropriate development, protect and retain the community character, and efficiently provide urban services within UGA lands.

**UGA Objective LU 2:** Ensure that the site development process for the UGA provides flexibility in locating uses, a unified development plan for each site, and adequate opportunities for public involvement.

**UGA Objective LU 3:** Phase development of the UGA to minimize impacts on environmental quality and disruption of the social and business climate in the existing city.

## Open Space

**UGA Policy LU 5:** Establish a Transfer of Development Credits (TDC) Program prior to annexing any portion of the UGA.

**UGA Policy LU 6:** The TDC Program should transfer development credits from the priority open space areas identified in the City Open Space Program for use in the UGA.

**UGA Policy LU 7:** Prior to annexation of any portion of the Pits landowners will Confirm to the City that the PAA and County open space areas have been permanently protected under the City and County open space programs, as appropriate.

**UGA Policy LU 8:** Approval of the annexation of the Lake 12 Annexation Area should include permanent public access to the lake. (Note: The Washington Department of Fish and Wildlife maintains a public boat launch on the south side of the lake, However, parking, is limited there and the site does not have restroom picnic facilities)

**UGA Policy LU 9:** Approval of the annexation of the East Annexation Area should include provision of permanent public access to the In-City Forest.

Habitat areas are indicated in Figure 3-4.

## 3.5 BALANCING WITH OTHER GMA GOALS

Protection of Critical areas is mandated in the Growth Management Act (GMA) as one of many goals and directives in that statute. Critical areas protection however must be balanced with other competing goals.

The importance of balancing the range of GMA goals and polices is reflected in a Court of Appeals case *HEAL v. Hearings Board*, 96 Wn.App 522 (1999) in which the court made several important points in relation to critical areas:

“The GMA requires balancing of more than a dozen goals and several specific. directives in implementing those goals. The Legislature passed RCW 36.70A.172(1) five years after the GMA was adopted. It knew of the other factor, but neither made best available science the sole factor, the factor above all other factors nor made it purely procedural. Instead, the Legislature left the cities and counties with the authority and obligation to take scientific evidence and to balance that evidence among the many goals and factors to fashion locally appropriate regulations based on the evidence not on speculation and surmise.”

“While the balancing of the many factors and goals could mean the scientific evidence does not play a major role in the final policy in some GMA contexts, it is hard to imagine in the context of critical areas. The policies at issue here deal with critical areas, which are deemed "critical" because they may be more susceptible to damage from development. The nature and extent of this susceptibility is a uniquely scientific inquiry.

It is one in which the best available science is essential to an accurate decision about what policies and regulations are necessary to mitigate and will in fact mitigate the environmental effects of new development.”

This approach is reflected in Growth Management Hearings Board cases:

GMA, the practicality of the science and the fiscal impact must be balanced by a local government in determining how to designate and protect CAs. The scientific evidence must be contained within the record but also must be practical and economically feasible. CCNRC v. Clark County 96-2-0017 (Final Decision and Order, 12-6-96)

## 4. LANDSCAPE–SCALE ANALYSIS

This section summarizes the results of the landscape-scale analysis found in Technical Appendix A. The study based generally on the approach in “Protecting Aquatic Ecosystems: A Guide for Puget Sound Planners to Understand Watershed Processes” developed by the Washington State Department of Ecology (Stanley et al. 2005). The approach addresses two main questions:

- Which geographic areas are important for key landscape processes?
- Have human activities in the important areas altered the key processes?

The landscape-scale analysis helps integrate ecosystem processes into sensitive areas assessment and planning (Hruby et al. 2005). The analysis also considers aquatic processes and functions at multiple scales when developing plans for protecting or restoring sensitive areas. (Gove et al. 2001).

### 4.1 CONTRIBUTING AREA

The contributing area is the portion of land where surface water, groundwater, and water-borne materials flow into the streams, lakes, or other aquatic resources within the subwatershed, and where key processes influence aquatic functions (Stanley et al. 2005). For this study, we defined the contributing area on several scales:

- The Green River/Soos Creek/Covington Creek basin
- The Lake Sawyer sub-basin
- The Middle Green River/Crisp Creek sub-basin
- The Rock Creek/Cedar River sub-basin

These contributing areas are shown in Figure 3-2. Watersheds are primarily oriented to surface water. As discussed below, local groundwater movement cuts across surface water basins and generally flows in a westerly direction.

#### 4.1.1 Green River Basin

All of the Black Diamond Urban Growth Area (UGA) is in the Green River Basin. The UGA is located within the middle portion of the Green/Duwamish River watershed and is in two sub-basins as shown in Figure 4-1:

- The Covington Creek sub-basin flows into the Soos Creek sub-basin, which then flows into the Green River at about river mile 33.

- The Crisp Creek sub-basin flows into the Green River within the Middle Green River sub-basin. It drains an area of roughly 3,200 acres.

The Green/Duwamish River watershed is the largest freshwater component of Water Resources Inventory Area (WRIA) 9. Historically the White, Green and Cedar (via the Black) Rivers flowed into the Duwamish River and the system drained an area of over 1,600 miles. Because of the diversion in the White River in 1911 and the Cedar River in 1916, the Green/Duwamish drainage area has been reduced to 556 square miles (KC DNR 2000).

The Green/Duwamish River is the most hydrologically and habitat altered large river system in the Puget Sound area. Bank hardening and levee projects began in the mid to late 1800's. The river system has been impacted by water diversions, alterations to the channel and estuary (such as filling and deepening), and development has disconnected its floodplains.

The middle portion of the Green River is primarily composed of residential development (50 percent), commercial forestry (27 percent), and agriculture (12 percent). Most of the upper basin is composed of rural residential, commercial forestry, and agriculture while cities and unincorporated urban areas dominate the lower portion of the basin. (King County 2000)

Riparian conditions in the Middle Green River subwatershed vary widely based on channel type and surrounding land use. According to NMFS criteria for riparian function, most riparian zones in the middle portion of the Green River (with the exception of the undeveloped Green River gorge) currently are not functioning properly because either they are too narrow and/or support non-native vegetation (King County 2000).

#### **4.1.2 Soos Creek/Covington Creek**

Covington Creek originates in the northwest portion of the City of Black Diamond at the outfall of Lake Sawyer. It is part of the Soos Creek subbasin, which drains an area of approximately 70 square miles and contains approximately 25 identified tributary streams totaling over 60 linear miles. Covington Creek is one of three major tributaries in the Soos Creek subbasin. It flows 6.33 miles generally southwest before entering Big Soos Creek near Wynaco. (King Co DNR 2000).

#### **4.1.3 Lake Sawyer**

The Lake Sawyer sub-basin is 13 square miles, of which 6.59 miles is located in the UGA (Figure 3-1). Its primary tributaries are Rock Creek and Ravensdale Creek. Rock Creek is located largely within the city limits and UGA. The majority of Ravensdale Creek is outside the UGA in an area zoned for resource forestry use.

Lake Sawyer is the fourth largest lake in King County with a surface area of 286.1 acres. The lakeshore is primarily developed as single family lots which accounts for about 85 percent of the shoreline. The lake is used extensively for boating, water skiing, swimming and fishing. Public access is provided at county parks on the northwest side and southern parts of the lake. The City of Black Diamond annexed the lake and surrounding homes in 1998.

Lake Sawyer has had historical water quality problems related to the discharge of wastewater from a failed wetland treatment system. The wastewater was diverted to the sanitary sewer in 1992. A draft lake management plan was developed in 1996 by King County to address the long-term water quality protection of the lake and watershed. The management approach for Lake Sawyer and its watershed as stated in the Draft Management Plan is to address the nutrient loading from the watershed to maintain its existing conditions.

#### 4.1.4 Middle Green River Creek/Crisp Creek

The Crisp Creek watershed is tributary to the Middle Green River and drains roughly 3,200 acres. The creek originates from several groundwater springs, including Keta Creek Springs and a 20-acre bog northwest of Kievee Lake (Kerwin and Nelson, 2000; Muckleshoot Indian Tribe, March 1992). The creek is about 3 miles long and enters the Green River at about River Mile 40. Two lakes, Horseshoe Lake and Keevie Lake, are located within the Crisp Creek basin. Approximately 17 percent of the drainage area is within the Black Diamond UGA.

The land use and land cover in the upper Crisp Creek watershed are characterized by second growth commercial forest lands. Downstream of the commercial timberlands the riparian area becomes wider with mostly deciduous trees. The lower reach of the creek includes several farms and a few single-family homes.

Crisp Creek provides spawning and rearing habitat for coho, chinook, chum and winter steelhead (Kerwin and Nelson, 2000) and serves as the water supply for the Keta Creek Hatchery, operated by the Muckleshoot Indian Tribe. The hatchery rears and releases chum, coho, chinook, and winter steelhead (released off-station).

#### 4.1.5 Rock Creek Tributary to the Cedar River

The Rock Creek watershed originates at Lake 12 is tributary to the Cedar River and drains roughly 32 square miles. The 9.5 mile long Rock Creek has been identified as the highest quality remaining tributary habitat in the lower Cedar River (King County 1997). The stream supports chinook, coho, sockeye and steelhead salmon, as well as cutthroat trout and a variety of other species. The near natural conditions of the creek provide spawning habitat and a variety of lifecycle habitats for a wide range of species, largely due to the intact riparian forests. (King County 1993) A large portion of the water basin has been protected by the Black Diamond Area Open Space Protection Agreement. The only portion of the sub-basin in the Black Diamond UGA is Lake 12.

### 4.2 KEY LANDSCAPE PROCESSES

Landscape (or ecosystem) processes and functions are complex, interrelated, and work on multiple temporal and spatial scales.

Watershed physical processes deliver, transport, store, and remove materials from the ecosystem thereby affecting the structure and biological functions of river and lake shorelines. The movement of water, sediment, chemicals, and organic material occur throughout the landscape, but these processes occur at varying intensities depending on local geologic and climate conditions. The following section describes ecosystem processes, the mechanisms through which and identifies areas most important for supporting those processes. This section summarizes conditions broadly across the entire study area.

Key processes important for maintaining aquatic resources such as streams, lakes, and wetlands are (Beechie et al. 2003):





- **Hydrology** (surface and ground water) The cycling of water through the ecosystem is dependent on geologic and climate controls such as slope, elevation, precipitation type and amount, soil permeability, and storage potential on the surface (landform) and underground (soil porosity).
- **Sediment** The cycling of sediment through the ecosystem is dependent on geologic and climate controls such as slope, land cover, soil cohesion, precipitation duration and intensity, and storage potential determined by landform. Also important are interactions with the hydrologic process which is a vehicle for both sediment delivery and transport. Therefore, many of the alterations to the hydrologic process also directly and indirectly affect the sediment process. Important areas for sediment storage are the same as those described for water. Depressional areas such as lakes, wetlands, and floodplains allow for the precipitation of suspended sediment in slack water.

**Water Quality** The delivery and elements and compounds in water bodies is highly dependent on water and sediment processes that provide a vehicle for dissolved and adsorbed materials to be transported. These mechanisms for delivery result in a balance in natural systems that are often disturbed by human activity. Storage of materials that affect water quality is similar to those for sediment, where adsorbed compounds such as phosphorus, nitrogen, and toxins can be deposited and potentially removed via biotic uptake. In addition, wetlands with mineral soils are important areas where dissolved phosphorus can undergo adsorption and storage.

- **Organic Matter** Organic materials include living organisms and the carbon-based material they leave behind after dying, including coarse woody debris, finer woody debris, and detritus. These elements are important for the cycling of energy and nutrients in aquatic ecosystems, including storage, transport, and chemical transformation (Naiman 2001). In addition, downed trees play a significant role in the aquatic ecosystems of the Pacific Northwest. Large woody debris (LWD) significantly influences the geomorphic form and ecological functioning of streams. In a natural system, LWD provides organic material to aquatic ecosystems and is considered a principal factor in forming stream structure and associated habitat characteristics (e.g., pools and riffles). Riparian vegetation is the key source of LWD.
- **Other Processes** Other secondary processes have less widespread but important influences on overall ecological function in shorelines, including heat/light inputs, biotic interactions, and habitat connectivity.

Each landscape process influences and may impair ecological functions. For example, erosion and mass wasting determine sediment inputs to aquatic systems, while other mechanisms act to store or transport the delivered sediment through the system. These mechanisms are associated with specific areas (referred to as important areas) on the landscape that exhibit certain characteristics (geology, vegetation, and land use). The relationship between processes, mechanisms, and important areas is summarized in Table 4-1.

**Table 4-1. Mechanisms and Important Areas for Landscape Processes**

Process	Mechanism	Important Areas
Hydrology	Infiltration/recharge	Permeable soils, riparian areas, floodplains
	Surface water storage	Depressional wetlands, lakes, floodplains,
	Peak flows	Impervious surfaces, rain-on-snow (ROS) zone, forest cover
	Groundwater movement (baseflow)	Permeable deposits, fissured bedrock
Sediment Supply	Erosion	Erodible soils, especially on steep slopes, Channel Migration Zones (CMZs)
	Mass wasting	Slopes prone to landslides
Water Quality	Physical properties (temperature, turbidity)	Forest cover, riparian zones
	Chemical properties (pH, nutrient levels)	Depressional wetlands, wetlands with organic soils, riparian zones, hyporheic zones, floodplains
	Contaminants (toxins, pathogens)	Depressional wetlands, riparian zones, hyporheic zones, floodplains
Organic Inputs/LWD	Riparian vegetation	Riparian zones, forested CMZs
	LWD recruitment	Riparian zones, forested CMZs, landslide hazard areas

The geographic location of these specific features (e.g., depressional wetlands, permeable surficial deposits, or steep gradients) is used to identify process-intensive areas. Because of their inherent characteristics, areas that are identified as process-intensive have greater influence on aquatic resource structure and function than other areas, and therefore may be more important for protection and/or restoration (Stanley et al. 2005).

#### 4.2.1 Hydrology

Hydrology is the study of the movement of water through the landscape. For purposes of this report, hydrologic mechanisms include infiltration and recharge, surface water storage, peak flows, and groundwater flow. Two other important hydrologic mechanisms, interception and evapotranspiration, are not considered in this landscape analysis, but their alteration is inferred from changes in land cover. A graphic depiction of the hydrologic cycle under natural conditions and with human alteration is shown in Figure 4-2.

Well-drained soils, floodplains, depressional wetlands, and lakes are all areas of importance for the hydrology (distribution of water) over the landscape. As water contacts the ground surface, typically in the form of precipitation, infiltration is the first mechanism that determines how water moves through the landscape. Infiltration is important as the source of water (recharge) for lateral subsurface movement (interflow) or baseflow (groundwater), which in turn is important for aquifer recharge and stream discharge. Depressional wetlands, floodplains, and lakes/ponds all have the potential to store water, particularly during peak flow events (Sheldon et al. 2003; Hrubby et al. 2000). This surface water storage releases runoff over time a longer duration, and reduces peak flows from storm events. Sources of runoff include direct precipitation onto surface waters, overland flow, interflow, and

groundwater discharge. The rate, distance, and volume of water movement across the landscape vary for each of these water sources, and this variability desynchronizes flows.

The local watersheds that feed the Lake Sawyer sub-basin are primarily dependent on rain and groundwater interflow. The area is too low in elevation to receive a substantial component of snow. Rains come primarily in the winter, and summers tend to be dry. On a seasonal basis, approximately 50 percent of the annual precipitation falls in the four month period October through January, and about seventy-five percent in the six months between October and March (King Co 2002).

General conclusions about the hydrology of the Black Diamond UGA include:

- Most of the streams in the UGAs are smaller, headwater systems. The majority of the mechanisms that affect their use by aquatic species, including anadromous fish, are related to processes within the UGA.
- Large portions of the UGA currently are undeveloped and therefore have relatively intact hydrologic processes.
- Urban land use (namely the addition of impervious surfaces and clearing of native vegetation) has the greatest potential to alter watershed hydrology. Therefore increasing urbanized areas, construction activities, road networks, and land clearing within the City and UGA would negatively alter watershed hydrology and directly impact usage of study area streams by aquatic species, including anadromous fish.
- An important feature of all the streams in the area is that they either originate in large wetland complexes or have substantial wetlands along the watercourse. These wetland complexes are an essential element of the hydrology, particularly for low flow periods. The local sources of recharge to these wetlands is fundamental in maintaining their functions and warrants both Sensitive Area regulations and stormwater controls, including Low Impact Development. The importance of these factors is discussed in the following sections.

#### **4.2.2 Vegetation**

The plant cover over a landscape or on a site influences the interaction of water and surficial geology. Plants perform a number of important functions that control the distribution of water, including:

- Intercepting precipitation, which decreases water's available energy for sediment transport;
- Recirculating water through transpiration, which may, in turn, influence local climatic conditions;
- Providing shade, which moderates temperatures and humidity near the ground's surface;
- Stabilizing soil structure with their roots; and
- Providing organic input, nutrient enrichment, and habitat structure.

Vegetation has a crucial role in the hydrologic cycle by affecting the rate at which water reaches the surface by providing a physical barrier that reduces the force of raindrops hitting the surface and also by intercepting, storing and releasing water at a reduced rate.

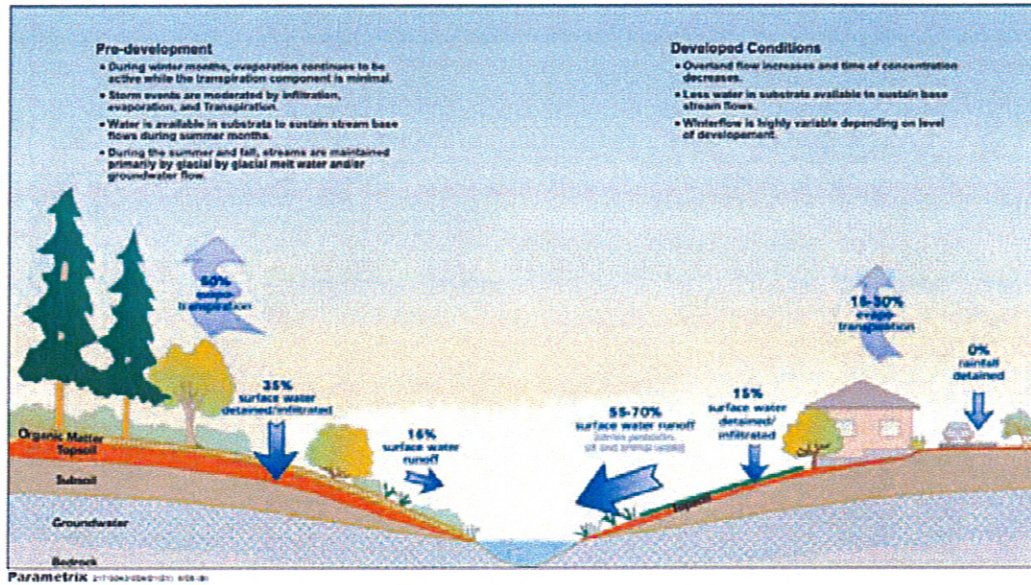


Figure 4-2. Hydrologic Cycle

Unlike geology and climate, human activities can easily alter vegetation. The type and extent of vegetation on a site, or within a region, can vary dramatically over a short time-interval as a result of human actions (i.e., burning, clearing, irrigation). Thus, it is a proximate control that can be managed.

Changes in vegetation cover associated with urban development are discussed in conjunction with land use, below.

#### 4.2.3 Sediment Supply

Sediment is moved from hillslopes to aquatic systems by water and gravity. Hillslope sediment transport is accomplished primarily through surface erosion, mass wasting, and slope creep; therefore areas of erodible soil and landslide-prone hillslopes are important areas for sediment supply processes. Clearing vegetation, exposing erodible soils, or increasing the amount of impermeable surface may affect the pattern and timing of water distribution, which may, in turn, accelerate erosion and slope failures.

As with the hydrologic component, the majority of the mechanisms that affect use of streams in the Lake Sawyer watershed are within the UGA. Large portions of the study area within the City and UGA currently are undeveloped and are unlikely to contribute significant sediment to study area streams. Urban land use, construction, forestry, and instream erosion have the greatest potential to produce substantial inputs of sediment within the Green/Duwamish River basin. Therefore increasing urbanized areas, construction activities, and road networks within the City and UGA would increase sediment delivery to its streams and directly impact their use by aquatic species, including anadromous fish. This would have the most direct impact to the Lake Sawyer subwatershed.

#### 4.2.4 Organic Matter and LWD Inputs

Organic matter, often in the form of leaf litter and other plant detritus, is the basis of the food web and largely determines productivity in aquatic and terrestrial systems. Riparian areas are important areas for organic and heat/light processes. Organic inputs provide nutrients and structure to the substrate and are an important food source for microbes, invertebrates, vertebrates, and plants (Sheldon et al. 2003). If abundant enough, organic matter may be the principal component of organic soils (peat, muck). Originating as plant and animal matter, organics may be imported to an aquatic site by surface waters or may originate in-situ. Land Cover and Land Use are shown in Figures 4-3 and 4-4.

Most stream reaches (and associated riparian areas) within the study area are important sources of organic matter and LWD. These include all streams in the Lake Sawyer subwatershed except Ginder Creek, whose riparian area is heavily developed. The mainstems of Rock Creek and Ravensdale Creek, as well as their tributaries (except Ginder Creek), are particularly important for the delivery of organic matter and LWD to portions of the system that support anadromous fish, including the mainstems of Rock and Ravensdale Creeks as well as Lake Sawyer, Covington Creek, and Jones Lake.

In summary, as with water quality, the majority of the mechanisms (including delivery of organic material and LWD) that affect the use of Lake Sawyer subwatershed streams for aquatic species, including anadromous fish, are related to processes within the City and its UGA. In contrast, the majority of the mechanisms that affect the use of streams within the Green River subwatershed are located outside of the City and its UGA limits, with the exception of any processes related to Horseshoe Lake and possibly Keevie Lake.

#### 4.2.5 Water Quality

Important areas for water quality processes are:

- depressional wetlands,
- floodplains, and
- hyporheic zones.

Wetlands, floodplains and hyporheic zones affect nutrient cycling (nitrogen and phosphorous), oxygen, pH, temperature and turbidity as well as pathogens and toxins (metals, hydrocarbons, pesticides). Wetlands store surface water, which traps sediment and facilitates phosphorus removal and contaminant absorption, uptake and storage. Denitrification and adsorption occurs in wetlands, particularly those with alternating reducing and oxidizing conditions or organic or clay soils. Wetlands can also be important phosphorous sinks because they trap and store sediment (Sheldon et al. 2003); particularly depressional wetlands with constructed outlets are conducive to standing water. Areas important for sediment storage such as floodplains and lakes are also important phosphorous sinks.

Figure 4-5 indicates the floodplains within the study area. Figure 4-6 indicates mapped wetlands,

These figures and data indicate that the wetland areas crucial to water quality functions include

- The large riparian wetland complexes located along Rock, Ravensdale, Ginder, and Black Diamond Lake Creeks, particularly those along Rock and Ravensdale Creeks.

- Additionally, the undeveloped, mature forests and wetlands in the upper reaches of Cranberry Slough, Black Diamond Lake Creek, and Lawson Creek provide important water quality functions for their respective basins. The upper portions of Lawson Creek and Cranberry Slough are of particular importance as they drain to water-quality limited lakes that provide habitat for anadromous fish..

Land use and the proportion of the built environment within a watershed can directly impact water quality in a given basin, including groundwater. Generally, the more developed a basin, the greater the proportion of impervious surface and potential for increased input of sediment, pollutants such as hydrocarbons, and nutrients to a water body. Storm events can enhance the movement of pesticides and metals bound to loose organic matter (Minton 2002), and increased sediment loads created by erosion can accumulate adsorptive pollutants (EPA 2001).

#### 4.2.6 Land Use

Land use activities related to agriculture, forestry, and residential/commercial development, can alter vegetation and, to a lesser extent, surficial geology, which can affect landscape processes. Land use acts as a stressor on natural processes disrupting the:

- interception and uptake of precipitation and nutrients;
- microclimate;
- the type and amount of nutrient and pollutant inputs;
- infiltration and recharge; and
- proportion of water distributed via surface and subsurface flows.

Changes in land use and resulting impacts would likely be exhibited in changes to Lake Sawyer, the most sensitive features in the watershed. Likely effects would be most apparent in an increase in nutrients and resulting reduction in water quality and associated features such as algae blooms. Land Cover and Land Use are shown in Figures 4-3 and 4-4.

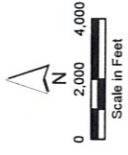
Constrinat on Land use in Black Diamond area relate to wetlands and streams as well as topographic features such as steep slopes, shown on Figure 4-7. Another major constrain on land use are abandon coal mines shown in Figure 4-8.

#### 4.2.7 Landscape Analysis Findings

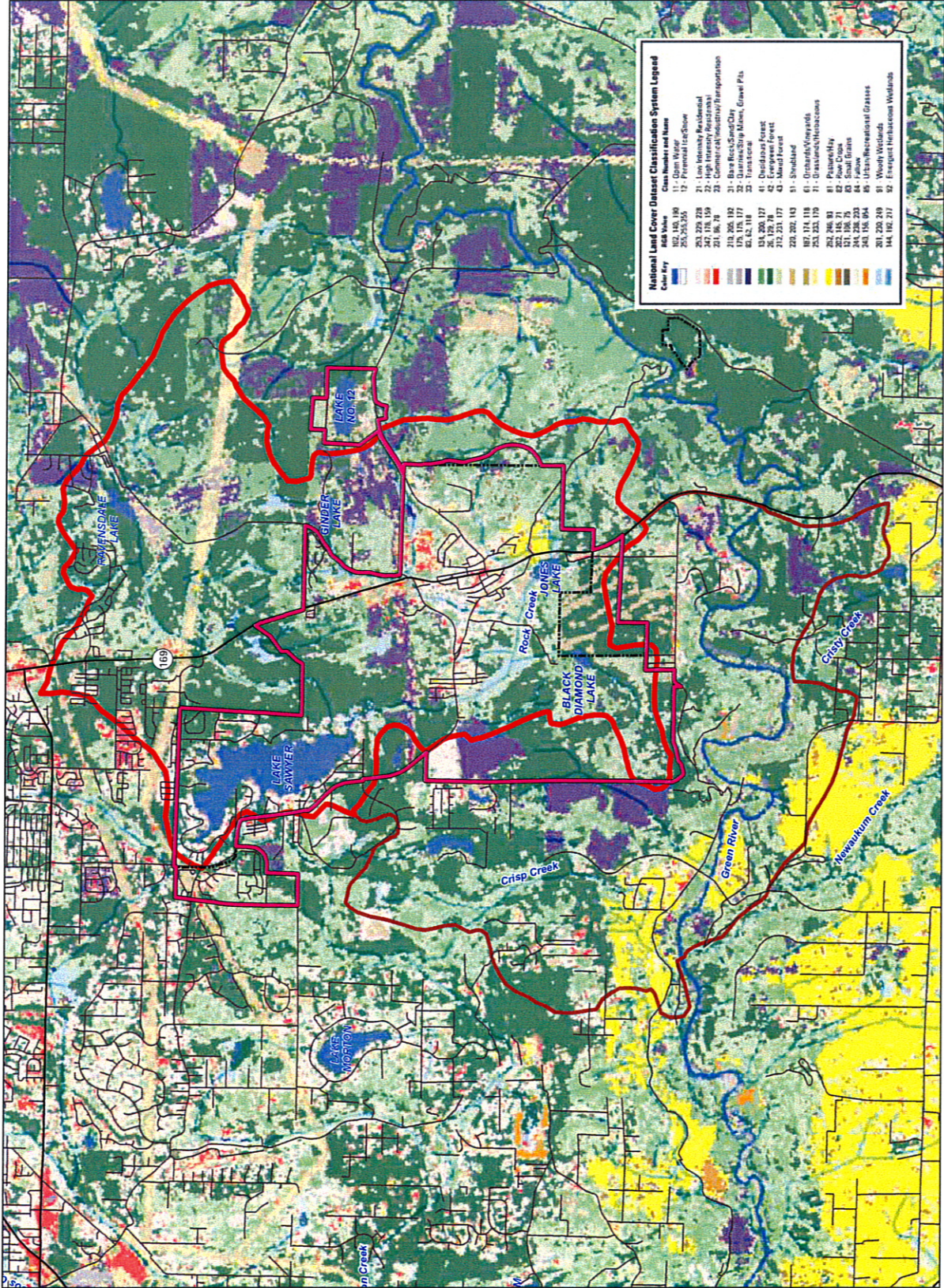
The vast majority of Black Diamond and its UGA are located in the Lake Sawyer subwatershed. These areas include several streams and lakes that are important to anadromous fish and other priority species. Many of these resources have relatively intact riparian areas, extensive wetlands, and relatively good water quality and instream habitat. Additionally, many of these areas provide numerous process-intensive functions that contribute to the overall productivity of the subwatershed. The maintenance of these functions throughout the UGA will be critical to maintaining ecological functions and values within Lake Sawyer. The lake has a relatively small watershed and will be extremely sensitive to changes brought on by urbanization.

The processes that occur within the City and its UGA have a relatively smaller impact on the larger Green River/Soos Creek/Covington Creek watershed simply because it is a small contributing area.

**Parametrix**



- Legend**
- Black Diamond
  - UGA Boundary
  - Lake Sawyer
  - Watershed
  - Green River/Crisp Creek Watershed
  - State Highway
  - Road
  - Water Body
  - Stream



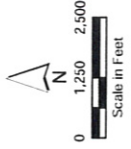
**National Land Cover Dataset Classification System Legend**

Color Key	Code	Class Number and Name
Blue	102, 103, 190	11 - Open Water
Light Blue	253, 253.05	12 - Perennial Ice/Snow
Light Green	242, 228, 228	21 - Low Intensity Residential
Light Yellow	241, 191, 191	22 - Medium Intensity Residential
Yellow	231, 16, 79	23 - Commercial/Industrial/Transportation
Orange	213, 205, 192	31 - Bare Rock/Sand/Clay
Red	179, 175, 177	32 - Quarries/Strip Mines, Gravel Pits
Dark Red	62, 62, 118	25 - Transitional
Dark Green	124, 200, 127	41 - Deciduous Forest
Light Green	125, 125, 125	42 - Coniferous Forest
Dark Green	212, 231, 177	43 - Mixed Forest
Light Green	229, 202, 143	91 - Shrubland
Light Green	187, 174, 178	61 - Grasslands/Vegetable
Light Green	253, 233, 179	71 - Grasslands/Herbaceous
Light Green	262, 246, 83	81 - Pasture/Hay
Light Green	252, 145, 71	82 - Row Crops
Light Green	344, 238, 233	83 - Other Crops
Light Green	244, 156, 164	85 - Urban/Recreational Grasses
Light Green	261, 220, 249	91 - Woody Wetlands
Light Green	144, 162, 217	92 - Emergent Herbaceous Wetlands

**Figure 4-3**  
**Land Cover**

Sensitive Area Ordinance Update  
City of Black Diamond, WA

**Parametrix**

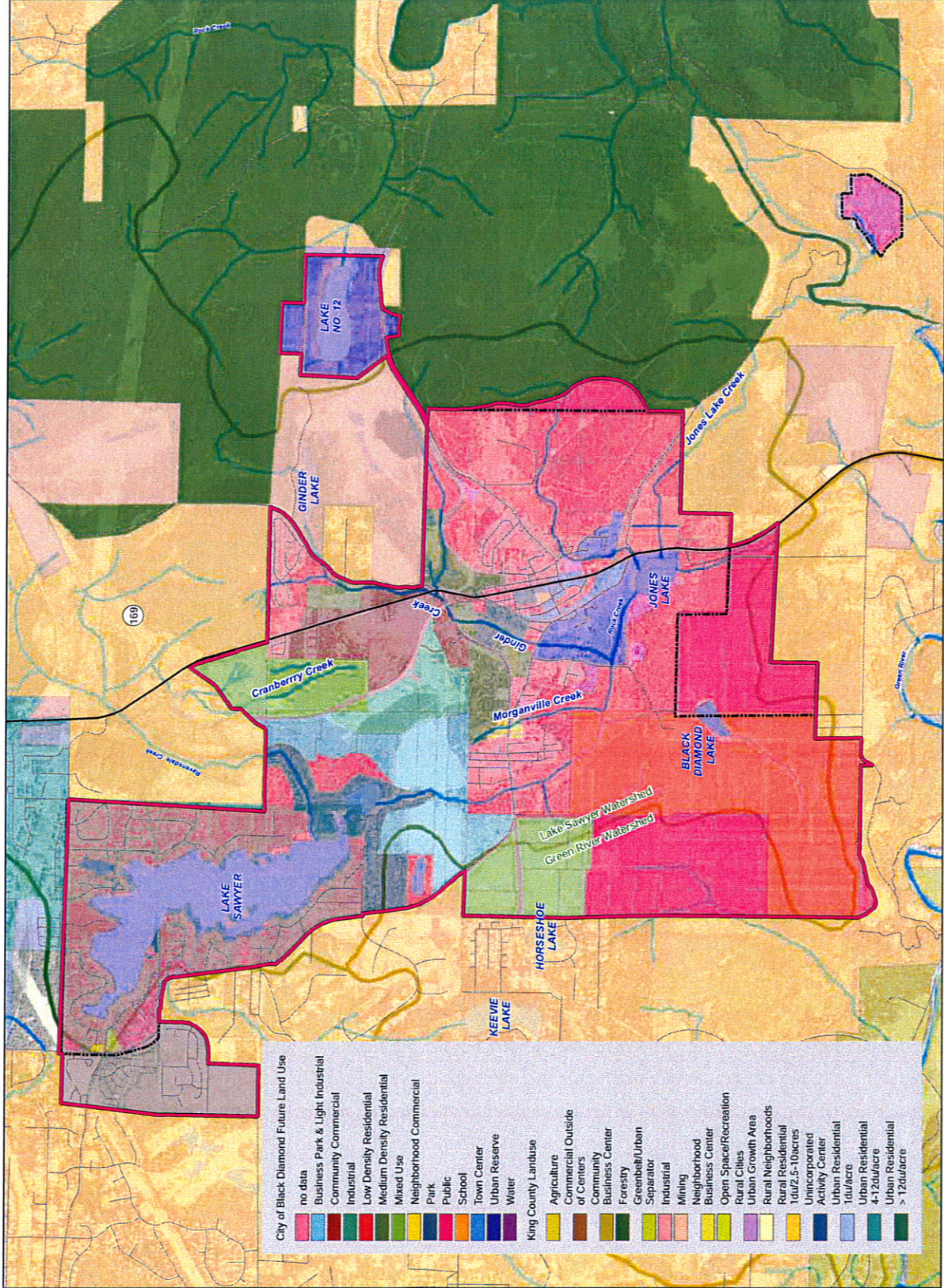


- Legend**
- Black Diamond
  - UGA Boundary
  - Green River/Crisp Creek Watershed
  - Lake Sawyer Watershed
  - State Highway
  - Road
  - Water Body
  - Stream

Data Source: King County GIS, WA DNR, Tiad

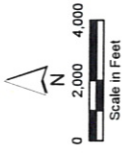
**Figure 4-4  
Land Use  
Black Diamond UGA**

Sensitive Area Ordinance Update  
City of Black Diamond, WA





**Parametrix**

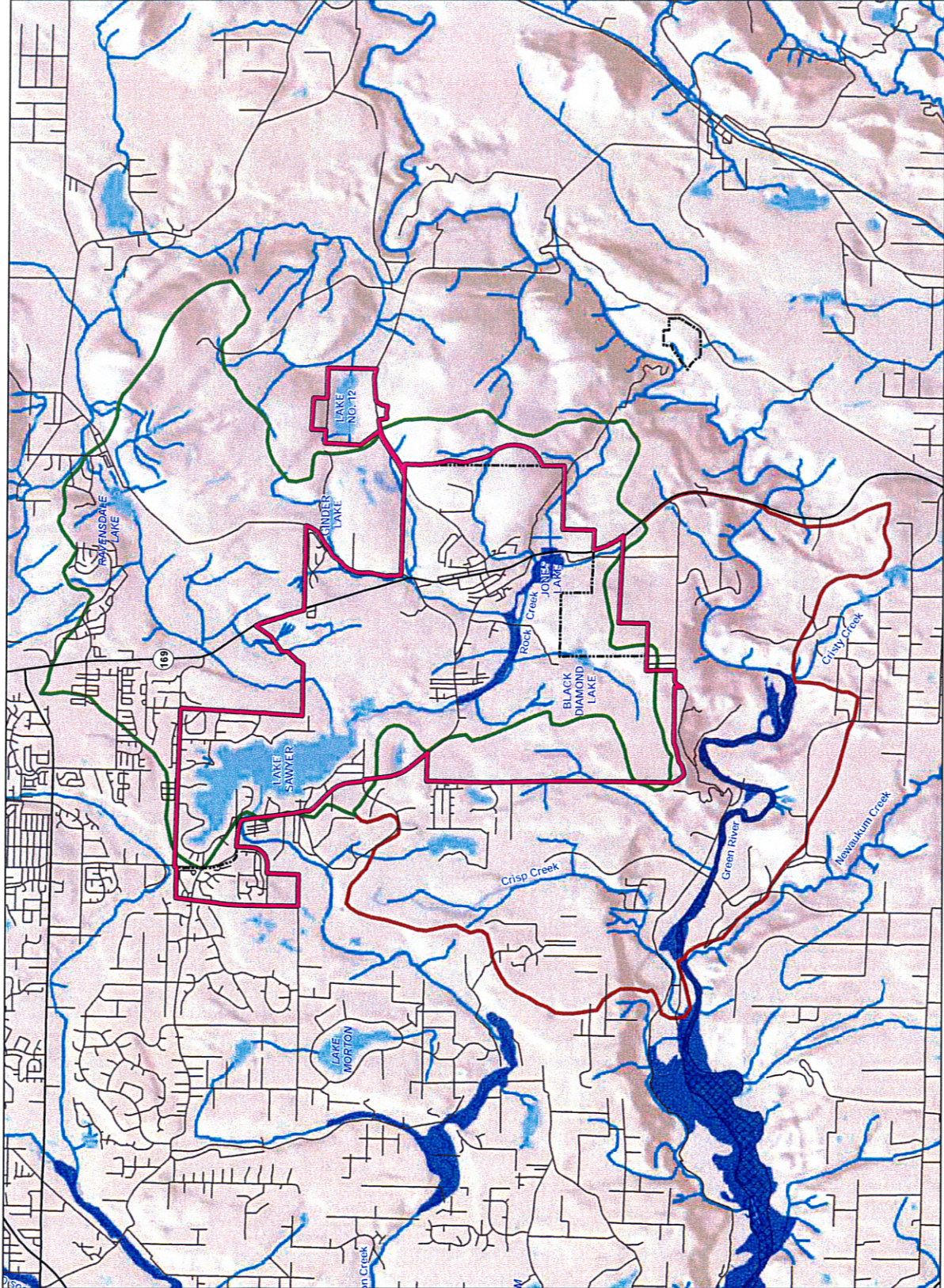


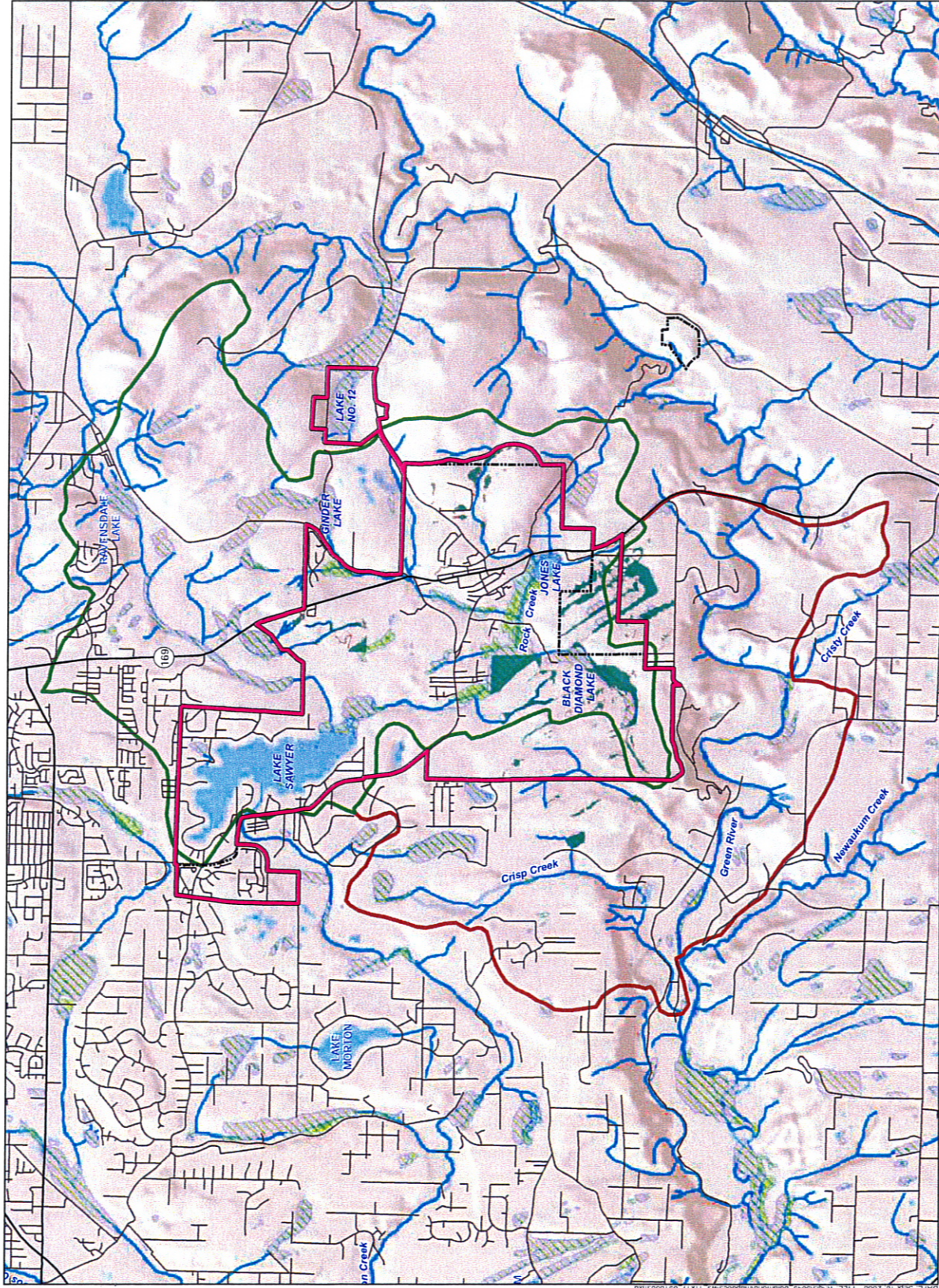
- Legend**
- Black Diamond
  - UGA Boundary
  - Lake Sawyer Watershed
  - Green River/Crisp Creek Watershed
  - State Highway
  - Road
  - Water Body
  - Stream
  - 100 Year Floodplain
  - Floodway

Data Source: King County GIS

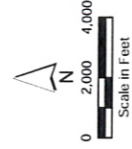
**Figure 4-5  
FEMA Floodplain**

Sensitive Area Ordinance Update  
City of Black Diamond, WA





**Parametrix**

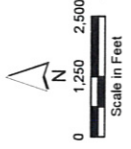


- Legend**
- Black Diamond
  - UGA Boundary
  - Lake Sawyer Watershed
  - Green River/Crisp Creek Watershed
  - State Highway
  - Road
  - Water Body
  - Stream
  - King County CAO Wetland
  - NWI Freshwater Emergent Wetland
  - NWI Freshwater Forested/Shrub Wetland
  - Triad Surveyed Wetlands

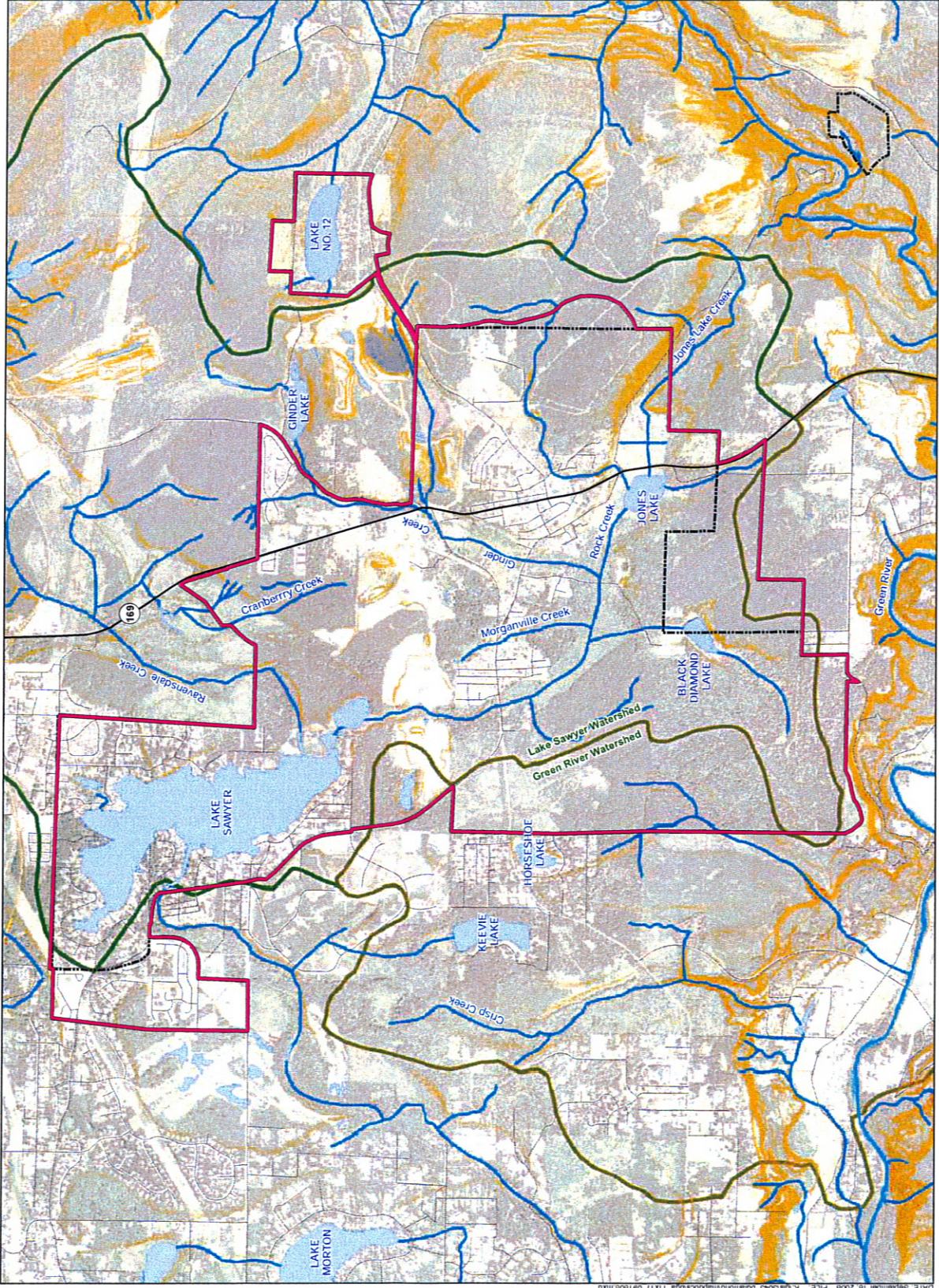
Date: Sources: King County GIS, WA DNR, Triad

**Figure 4-6 Wetlands**

**Parametrix**



- Legend**
- Black Diamond
  - UGA Boundary
  - Green River/Crisp Creek Watershed
  - Lake Sawyer Watershed
  - State Highway
  - Road
  - Water Body
  - Stream
  - > 40% slope from topography

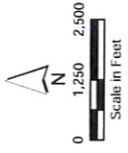


Data Source: King County GIS, WA DNR, Ellis 1912 V&G Survey Station 3

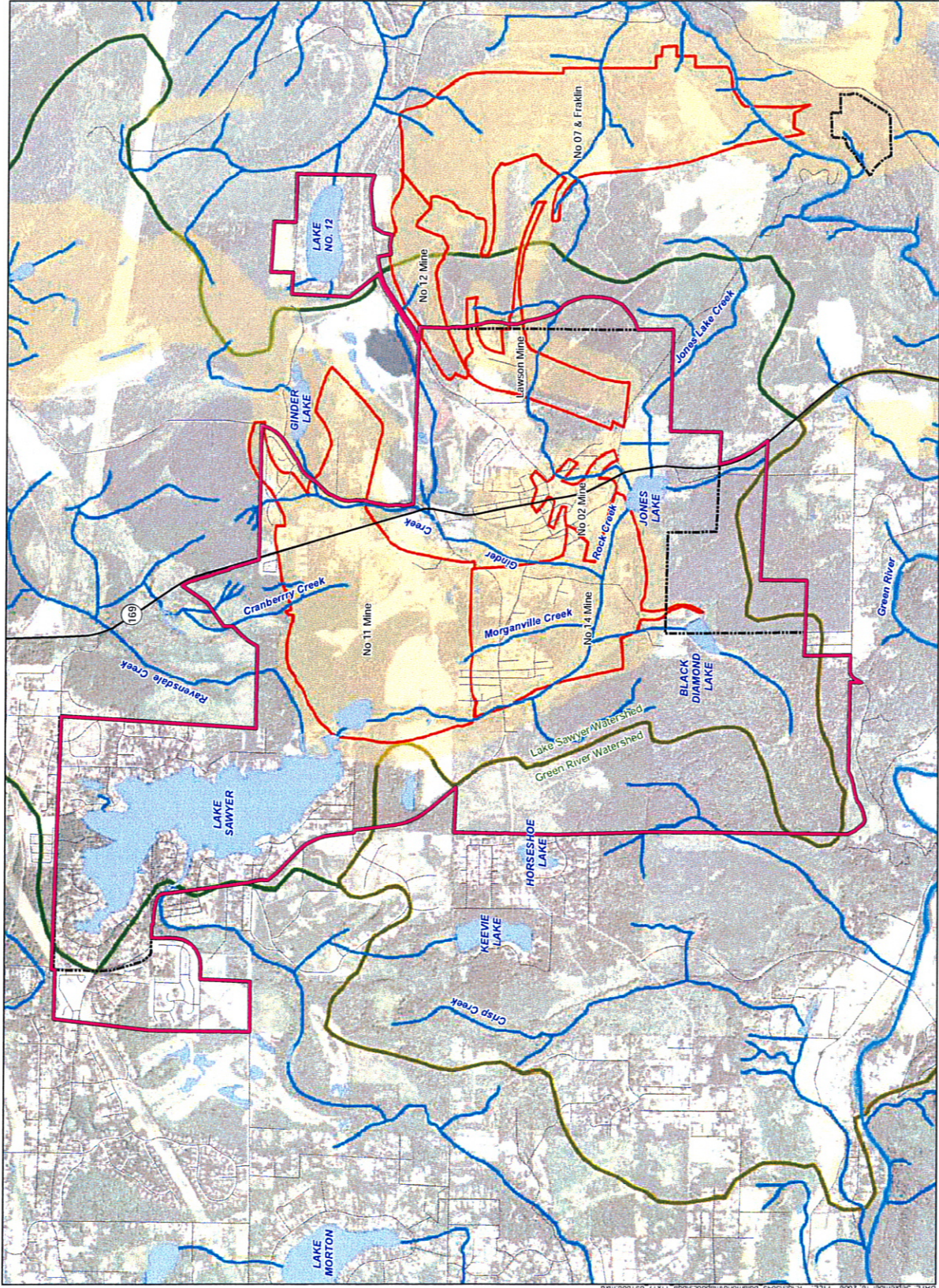
**Figure 4-7  
Steep Slopes  
(from topography)  
Black Diamond UGA**

Sensitive Area Ordinance Update  
City of Black Diamond, WA

**Parametrix**



- Legend**
- Black Diamond Boundary
  - UGA Boundary
  - Green River/Crisp Creek Watershed
  - Lake Sawyer Watershed
  - State Highway
  - Road
  - Water Body
  - Stream
  - Coal Mine Hazard Area
  - Mapped Mine Hazards
  - Mine Boundary



Date: Source: King County GIS, WA DNR, File: 1912 WA Geo Survey Bulletin 3  
**Figure 4-8**  
 Abandoned Coal Mine Hazard Areas  
 Black Diamond UGA  
 Sensitive Area Ordinance Update  
 City of Black Diamond, WA

The processes that occur in the portion of the UGA in the Middle Green River/Crisp Creek watershed primarily are related to groundwater recharge. The City and its UGA provide fewer process-intensive functions contributing to the overall productivity of that subwatershed, but may be critical to processes that occur in the nearby Horseshoe Lake and possibly Keevie Lake.

The analysis above of the areas associated with the important functions related to hydrology, vegetation, sediment balance, and water quality indicates that:

- The Rock Creek/Jones Lake/Jones Creek corridor has the largest concentration of critical features that affect landscape function, including a large complex of wetlands that provides flood desynchronization, water storage, and a variety of nutrient control functions critical to the health of the watershed. This corridor provides the most important aquatic and terrestrial habitat areas.
- Black Diamond Lake and the associated stream has a large and important concentration of similar features, including a large wetland complex, but is less important currently due to the smaller tributary watershed.
- Large wetland complexes that provide the headwaters of many streams are important for water storage and maintaining year-round stream flows and temperature moderation. Such wetland complexes for the headwaters of Ginder Creek, Lawson Creek, and Jones Creek are present in many smaller tributaries in the area.
- Tributary streams in the area have a variety of gradients and flow conditions, as well as varying degrees of human alteration. Generally, they are less important in providing aquatic and wildlife habitat, but they are critical to providing inputs of high quality low temperature water to the systems with the greater concentrations of landscape functions.

Regulatory implications of these findings lead to a recommendation that the City of Black Diamond can take an approach that provides a high level of protection for the most important areas of the city that contribute the most to current ecological functions. This would be accompanied by a lower level of protection for those specific critical area resources in specific contexts where they contribute less to key functions. By this focused approach, the City is likely to be successful in preserving key ecological functions while accommodating growth goals.

## 5. SPECIFIC CRITICAL AREAS

### 5.1 WETLANDS

Wetlands occur throughout the City of Black Diamond and its UGA and are primarily associated with bodies of water (lakes and streams) but also occur separately. Brief summaries of the functions of these wetland complexes are outlined below. It is unknown whether freshwater wetlands were displaced by past residential, commercial, and forestry uses. Any wetlands that may have existed in developed portions of the City have been displaced.

- Rock Creek Wetlands Wetlands associated with Rock Creek are mapped by the NWI as scrub/shrub and forested wetlands. This wetland complex was given a preliminary Category I rating under the Ecology wetland rating system.

- Jones Lake/Creek Wetlands Jones Lake is a dystrophic lake, characterized by relatively high concentrations of acidic organic materials in solution. Such lakes generally form in conjunction with associated wetlands, particularly bogs and peat deposits that provide a unique ecological environment in which the acidity of the water retards the processes of bacterial breakdown that would otherwise recycle nutrients. This results in a departure from the normal eutrophic life cycle of lakes and wetlands. Jones Lake and Creek wetlands can be considered an extension of the larger system along Rock Creek to the west.
- Black Diamond Lake/Creek Wetlands Wetlands associated with Black Diamond Lake and Black Diamond Creek are characterized as a forested wetland, and more particularly as a bog. The King County Wetland Inventory identifies the wetlands associated with Black Diamond Lake and the upstream and downstream reaches of Black Diamond Creek as unique/outstanding. The Black Diamond Lake and its associated world-class bog have been extensively researched by the Nature Conservancy and represent a valuable natural asset for the City. The low elevation riparian wetland associated with Black Diamond Lake is also considered a high quality wetland ecosystem.
- Ginder Lake, Ginder Creek, and Lake Sonia Wetlands Wetlands associated with Ginder Lake and Ginder Creek are mapped by the NWI as emergent and forested wetlands. Wetlands surrounding the lake (possibly the lake itself) and associated with the creek were given a preliminary Category II rating under the Ecology wetland rating system (City of Black Diamond 2008).

Wetlands associated with Lake Sonia are mapped by the NWI as emergent and scrub/shrub wetlands. These wetlands are located outside of the City of Black Diamond UGA; it is unknown whether they were preliminarily rated using the Ecology wetland rating system as part of the City's preliminary wetland and stream inventory conducted in 1991. The King County Wetland Inventory identifies the wetlands around Lake Sonia as unique/outstanding.
- Ravensdale Lake/Creek Wetlands Wetlands associated with Ravensdale Lake and Ravensdale Creek are important to the function of the stream and Lake Sawyer. These wetlands are predominantly located outside of the City of Black Diamond UGA and are mapped by the NWI as emergent, forested, and scrub/shrub wetlands. Ravensdale Creek has a disproportionately high discharge-to-drainage area ratio, likely due to a high level of groundwater recharge. Although its drainage area is about half that of Rock Creek's drainage area, Ravensdale Creek has an estimated summer low-flow season discharge about 3 times greater than that of Rock Creek. Phosphorus concentrations during the low flow season in Ravensdale Creek are relatively high due to naturally occurring phosphorus-rich groundwater.
- Lake 12 Wetlands Wetlands associated with Lake 12 are mapped by the NWI as forested and scrub/shrub wetlands. These wetlands are predominantly located outside of the City of Black Diamond limits but within the UGA. The wetland complex extends about a mile downstream of Lake 12 and provides important habitat, as well as flood desynchronization and water quality functions., the functions of the wetlands related to water quality are likely to become more important in the future. Wetlands associated with the lake shoreline also have the potential to provide shoreline protection functions.

## 5.2 AQUATIC RESOURCES

Aquatic resources within the study area include Green River, Covington Creek, and their tributaries; floodplain, depression, and slope wetlands; lakes; and groundwater. Historically, these aquatic resources provided important functions such as peak flow storage, groundwater recharge, water quality maintenance, and fish and wildlife habitat.

Principal fisheries species present within the study area include (Jeanes 2004):

- Chinook Salmon (*Oncorhynchus tshawytscha*): The principal stock of Chinook salmon present in the Green/Duwamish River watershed is summer/fall ocean type Chinook. WRIA data report Chinook salmon occurring in Covington Creek up to the outlet of Lake Sawyer as well as Crisp Creek and the portion of the Green River located in the study area (King County 2000).
- Coho salmon (*O. kisutch*): The Green/Duwamish River watershed supports one run of coho salmon, which is a mixed stock with composite production (WDFW 2002). Green/Duwamish River coho salmon are considered part of the Puget Sound/Strait of Georgia ESU. Lake Sawyer and Jones Lake as well as Covington, Ravensdale, Ginder, Rock, and Lawson Creeks are reported as providing spawning and/or rearing habitat for coho salmon. These sources also report rearing habitat within and spawning and rearing habitat within Crisp Creek and the portion of the Green River located within the study area.
- Steelhead (*O. mykiss*): Winter run steelhead within the Covington Creek basin are in the Puget Sound ESU, which is listed as threatened under the ESA. Covington Creek, Ravensdale Creek, Rock Creek, Lake Sawyer, Crisp Creek, and the portion of the Green River located in the study area are reported as providing spawning and/or rearing habitat for winter steelhead.

Cutthroat trout (*O. clarki*): Cutthroat trout exhibit both resident and anadromous life histories. Cutthroat trout found within the study area are part of the Puget Sound ESU, which does not warrant listing under ESA at this time as populations have been relatively stable over the past 10-15 years. The presence of cutthroat trout is reported in Covington, Ravensdale, Ginder, Rock, Lawson, Crisp, and Black Diamond Lake Creeks as well as Lake Sawyer and the portion of the Green River located in the study area. Most cutthroat trout in the study area likely exhibit resident life histories.

- Bull trout (*Salvelinus confluentus*): Puget Sound bull trout exhibit four distinct life histories: resident, adfluvial, fluvial, and anadromous.. All bull trout found within the study area are part of the Puget Sound DPS, which is listed as threatened under the ESA.
- Other Anadromous Species: The portion of the Green/Duwamish River basin located in the study area does not support pink salmon (*O. gorbuscha*); however, it does provide migration habitat for sockeye salmon (*O. nerka*), as well as spawning and rearing habitat for chum salmon (*O. keta*) (StreamNet 2008).
- Other Resident Species: Limited information is available on resident fish in the Lake Sawyer and Middle Green River subwatersheds. Native resident species likely to be present include sculpins (*Cottus spp.*), speckled dace (*Rhinichthys osculus*), and three-spine stickleback (*Gasterosteus aculeatus*). Relatively few non-native fish species are reported in the Green/Duwamish River. Species observed primarily include warm water game fish that are found in several of the basin's lakes. These include black crappie (*Pomoxis nigromaculatus*), brown bullhead (*Ameiurus*

*nebulosus*), smallmouth bass (*Micropterus dolomieu*), and largemouth bass (*Micropterus salmoides*).

As stated previously, most streams within the Black Diamond UGA drain to either the Lake Sawyer subwatershed or Middle Green River subwatershed. However, only a small portion of Covington Creek (the outlet for Lake Sawyer) is located within the City and UGA limits, i.e., the vast majority of this creek falls outside of the study area. Additionally, a portion of the UGA provides infiltration and groundwater recharge to the Middle Green River and Crisp Creek.

For these reasons, general descriptions of the character of Covington Creek and the Green River are presented in this landscape-scale analysis section. Detailed descriptions of aquatic resources located within the City and/or UGA are presented in Technical Appendix A of this report.

### 5.3 TERRESTRIAL HABITAT

The undeveloped areas within the Black Diamond UGA provide a variety of habitat types for the full range of species that inhabit the Puget Sound Lowland. Urbanization will convert much of this area for human activities. These areas will generally be lost as productive habitat for most species.

Habitat corridors are an approach that land managers and regulatory agencies have implemented to address impacts on wildlife habitats and species within human-influenced environments. Habitat corridors are contiguous, vegetated, conduits that connect habitat patches to other patches or larger landscape habitat components and prevent isolation of habitat. Corridor establishment attempts to mimic in a managed landscape some of the biologic processes that occur in animal movement in natural landscapes.

The functions of corridors may be as conduits to provide movement or may provide habitat functions, if wide enough and vegetated (Rosenberg et. al. 1997). The functions generally provided by corridors include:

- Providing a conduit for animals to move between one habitat patch and another on a daily or seasonal basis, without providing substantial habitat functions. Such habitats may be relatively narrower than habitat patches;
- Reducing species extinction rates by ensuring that populations or individuals are not isolated from others in the landscape as well as redoing detrimental genetic effects of isolated populations such as inbreeding and random genetic drift;
- Providing increased foraging habitat for a variety of species, if large enough;
- Providing an avenue for vegetative communities to maintain reproduction viability and colonize new areas particularly species carried in animal feces;

King County has designated Wildlife Habitat Networks that are designed to link wildlife habitat found within sensitive areas, their buffers, priority habitats, trails, parks or open space. The network is designed to provide for wildlife movement and alleviate the effects of habitat fragmentation. The county specifies that the corridor should be 300 feet wide, although it may be reduced to 150 feet where necessary. The city has designated the King County Habitat Network as well as a “Study Area for Potential Fish and Wildlife Habitat Conservation Area” in its Comprehensive Plan, as shown in Figure 3-5.

Combining habitat corridors with the core area for water and wetland functions including the entire Lake Sawyer/Rock Creeks /Jones Lake and Jones Lake Creek corridor as well as the



corridor extending to the west to the Crisp Creek watershed along the Black Diamond Lake and stream corridor is the most effective means of providing productive terrestrial habitat in the area as it urbanizes.

## 5.4 GEOLOGICAL HAZARDS

As indicated in Figures 4-7 and 4-8 steep slopes and mine hazards are the major geologic hazards within the city. Hazards related to slopes include slope stability and landslide hazards. Erosion is an additional concern for all sloped areas, especially those close to water bodies. In most cases, landslide hazards and erosion hazards can be assessed on a site-by-site basis.

Hazards associated with abandoned coal mines are directly related to mine collapse and land subsidence as well as methane gas generation and the risk of fire. The potential for coal mine collapse and land subsidence is influenced primarily by:

- the height of the mine void,
- the depth and the strength of the rock roof, and
- the type and amount of roof support within the mine (Crowell 2001).

There are two types of subsidence:

- sinkhole, also called pit or pothole; and
- sag or trough.

## 5.5 CRITICAL AQUIFER RECHARGE AREAS

Three factors generally dominate determination of aquifer susceptibility (Cook 2000):

- Overall permeability of the unsaturated zone (soil and underlying geologic strata);
- Thickness of the unsaturated zone (depth to groundwater in unconfined aquifers); and
- Amount of available recharge.

Evaluation of soils in the Black Diamond UGA indicate that most areas have a slight to moderate susceptibility to contamination. There are a number of wells providing public and private water supplies that should be protected as part of the city's regulatory system.

# 6. OPTIONS FOR PROTECTION OF SENSITIVE AREAS

## 6.1 CONTROL OF USE AND ALTERATION

The most common approach to protection of sensitive areas in Washington State that has been developed since the adoption of the Growth Management Act (GMA) in 1994 includes the elements of:

- Designation and classification of critical areas
- Restriction on land use and alteration within the resource area and buffers

This approach tends to focus on individual occurrences of features such as streams, wetlands and geologically hazardous areas. The management and protection mechanisms tend to be

related to a rating system that attempts to characterize the ecological functions and values provided by each discrete resource occurrence. A similar approach tends to focus on individual occurrences and the case-by-assessment of hazard and risk in the case of geological hazards, frequently flooded areas and aquifer recharge areas.

This approach that looks at discrete occurrences contrasts somewhat with the interpretation of the statutory mandate to “protect” these areas. Several Growth Management Hearings Board and court cases have provided clarification that is succinctly described as follows:

The Act's requirement to protect critical areas, particularly wetlands and fish and wildlife habitat conservation areas means that the values and functions of such ecosystems must be maintained. While local governments have the discretion to adopt development regulations that may result in localized impacts upon, or even the loss of, some critical areas, such flexibility must be wielded sparingly and carefully for good cause, and in no case result in a net loss of the value and functions of such ecosystems within a watershed or other functional catchment area [Tulalip Tribes of Washington (Tulalip I) v. Snohomish County, CPSGMHB Case No. 96-3-0029].

The “landscape analysis” approach outlined in Section 4, above, is one approach to analyze fish and wildlife habitat and wetlands on a watershed or catchment basis that provides a more integrated view of the inter-relationships between these resources.

### 6.1.1 Restrictions on use and alteration

Natural systems, such as wetlands and streams typically cannot provide an inter-related web of ecological functions if human intervention displaces or alters key features of the system. The most obvious human alteration is displacement. Filling a wetland eliminates virtually all functions and values provided. Culverting or piping a stream may have similar effects, although upstream and downstream portions of the stream may retain important functions.

Alteration that is less complete than displacement may interrupt important functions. For example, the removal and modification of riparian and aquatic vegetation, placement of the bulkhead structure and associated fill and removal of woody debris have the following effects:

- Increases flow velocities and change in the natural stream dynamics that produce substrate and other conditions for fish spawning and rearing;
- Increases in flow that increase bank erosion and downstream deposition that alters the substrate and other conditions for fish spawning and rearing;
- changes in wave action on lakes that alters substrate and other processes;
- loss of organic input (e.g., tree litter, LWD, insects) within the a stream or lake's littoral zone;
- loss of shade and temperature attenuation provided by large vegetation;
- displacement of physical aquatic and terrestrial habitat;

Generally, regulations for wetland, streams and lakes seek to prohibit most human alterations. Activities generally allowed are limited and commonly include:

- Utilities that can cross streams or wetlands either overhead or in buried (or bored) pipelines that produce minimal disturbance of ecological functions during operation.
- Essential public facilities, such as roads, that sometimes must cross water bodies to connect two points.

- Recreational uses such as fishing, hunting, bird watching and interpretation of natural features.
- Continued use and maintenance of existing features such as dams, water diversions; and existing or ongoing uses such as forestry or agriculture.
- Docks and boat launch ramps on water bodies that provide access for public recreation use;

It also should be recognized that water bodies, especially navigable waters, provide a variety of opportunities for commerce that are integral to our economic system. The state Shoreline Management Act passed in 1971 includes several key goals (RCW 90.58.020 and WAC 173-26-176(3)):

- (a) The utilization of shorelines for economically productive uses that are particularly dependent on shoreline location or use.
- (b) The utilization of shorelines and the waters they encompass for public access and recreation.
- (c) Protection and restoration of the ecological functions of shoreline natural resources.

Generally, critical area codes must allow for use of shorelines of the state for:

- Water dependent uses: Those uses that “cannot exist in any other location and are dependent on the water by intrinsic nature of its operation”.
- Water-related uses: Those uses that are not intrinsically dependent on a waterfront location but whose operation cannot occur economically without a shoreline location.
- Water enjoyment uses provide the opportunity for a significant number of people to enjoy the shoreline.

### 6.1.2 Buffers

Buffers are often thought of as areas that are outside of sensitive areas such as wetlands and water bodies that separate environmentally sensitive areas for areas of human activity and reduce the adverse impacts of human disturbance. (Norman 1996) This narrow definition however reflects a narrow classification-based view of such features and not an ecosystem perspective. The continued use of the term buffer is somewhat unfortunate, but likely will continue as a familiar concept.

It is important to note that the Growth Management Act requires the protection of “areas *and ecosystems*” (emphasis added) relating to wetlands, fish and wildlife habitat conservation areas and frequently flooded areas. The protection of an ecosystem must go beyond the areas that can be identified by discreet criteria, such as a wetland, or a specific stream reach to include ecosystem processes that occur outside those features.

### 6.1.3 Buffer Ecological Functions

A variety of functions occur in wetland and aquatic habitats that have essential links with upland areas, including:

- Providing for continued hydrological processes, that provide surface and ground water critical to maintaining wetland aquatic resources;

- Maintaining natural functions related to water quality, including removing sediment generated by natural processes and removing nutrients such as phosphorous and nitrogen;
- Maintaining the microclimate in upland areas, that influence the functions of wetlands and aquatic habitats, as well as the vegetation complexity of upland habitat;
- Maintaining adjacent habitat and wetland functions that are essential to certain stages of populations (such as the need for amphibians to spend part of their lifecycle in water);
- Maintaining an area sufficient for populations to be maintained in all their lifestages;

A scientific literature review indicates that the buffer width necessary to protect a given habitat function or group of functions depends upon numerous site-specific factors. These factors include the plant community (i.e., type of plant species present, density of plants, and age of vegetation community), aspect, slope, and soil type, as well as adjacent land use. The body of science indicates that the appropriate buffer width for a given ecological function is specific to the environmental setting and functions to be achieved by that buffer (Castelle and Johnson 2000).

A summary of specific functions provided in buffer areas for aquatic and wetland ecological functions are provided in the tables below

**Table 6-1. Generalized Comparison of Functions of Riparian Buffer Widths Aquatic Ecological Functions**

Stream Function	Buffer Width				
	15 Feet <sup>1</sup>	50 Feet	150 Feet	300 Feet	600 Feet
Microclimate	X	X	N	P	F
Wildlife Habitat	X	N	P	P	F
LWD Recruitment	X	N	P	F	F
Pollutant Removal	N	N	P	P	F
Sediment Filtration	X	N	P	F	F
Water Temperature	X	N	F	F	F
Organic Litter	X	P	F	F	F
Bank Stability	X	F	F	F	F

KEY

- F = Buffer width fully supports/maintains stream function
- P = Buffer width partially supports/maintains stream function
- N = Buffer width nominally supports/maintains stream function
- X = Buffer does not adequately support/maintain stream function

**Table 6-2. Generalization of Various Wetland Buffer Widths on Functions Provided**

Buffer Functions Provided	Range of Buffer Widths					
	25-50 ft.	50-100 ft.	100-150 ft.	150-200 ft.	200-250 ft.	250-300 ft.
Habitat:	L	L/M	M	M/H	M/H	H
Habitat connectivity						
Amphibians:						

**Table 6-2. Generalization of Various Wetland Buffer Widths on Functions Provided (Continued)**

Buffer Functions Provided	Range of Buffer Widths					
	25-50 ft.	50-100 ft.	100-150 ft.	150-200 ft.	200-250 ft.	250-300 ft.
Sensitive	L	L	L	L	L	L
Urban	L/M	L/M	M	M	M/H	H
<b>Birds:</b>						
waterfowl	L	L	M	M/H	M/H	M/H
urban adapted	H	H	M/H	M/L	L	L
edge spp.	M/H	M/H	M/H	M/H	M/H	M
interior <sup>2</sup>	L	L	L	L	L	L
<b>Mammals:</b>						
Small	L	L/M	M	M	M/H	M/H
Large	L	L	L	L	L/M	M
<b>Removing Sediment</b>						
Grassy slope less than 5%	M/H	H	H	H	H	H
60-90% removal grassy	L/M	H	H	H	H	H
Steep slope	L	L	L/M	M/H	H	H
<b>Particle Size:</b>						
Sands	H	H	H	H	H	H
Silts	M	M/H	H	H	H	H
Clay	L	L	L	L	L	L
<b>Removing excess nutrients</b>						
60% removal	H	H	H	H	H	H
80% removal	L/M	H	H	H	H	H
Bacterial	L	L/M	H	H	H	H

### 6.1.4 Buffer from Human Activities

Human activities can produce a variety of changes to ecological processes and proximity impacts can affect wetlands, aquatic and terrestrial wildlife habitat and other ecological processes.

There are basically two types of impacts that occur from human activities:

- Changes in inputs to ecological processes that affect the hydrologic cycle or other elements of the ecosystem. Buffers are generally not effective for these impacts, unless large enough to provide sufficient area for the processes to remain. Even in

those cases, impacts from outside the buffer are usually larger in scope and require other mitigation.

- Proximity impacts such as noise and light can disrupt feeding, breeding, and sleeping habits of wildlife and introduce predation from pets.

The table below summarizes the major impacts of human activities and the extent to which they can be addressed by buffers of other mitigating measures.

**Table 6-3. Examples of Impacts to from Adjacent Human Use**

Examples of Disturbance	Activities and Uses that Cause Disturbances	Examples of Measures to Minimize Impacts
Hydrologic Impacts <ul style="list-style-type: none"> <li>• Impervious surfaces</li> <li>• Increased runoff</li> <li>• Decreased infiltration</li> <li>• Stream erosion</li> <li>• Change in hydroperiod</li> </ul>	<ul style="list-style-type: none"> <li>• Impervious surfaces                             <ul style="list-style-type: none"> <li>○ Parking lots</li> <li>○ Roads</li> <li>○ Building roofs</li> </ul> </li> <li>• Vegetation alteration                             <ul style="list-style-type: none"> <li>○ Lawns</li> <li>○ Landscaping</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Buffers can provide an area in which these processes continue, their effectiveness depends on total area</li> <li>• Provide vegetated open space in development to retain functions</li> <li>• Infiltrate runoff</li> <li>• Provide stormwater detention and treatment for roads and existing adjacent development.</li> <li>• Prevent channelized flow from areas that directly enters the resource or buffer.</li> </ul>
Toxic runoff*	<ul style="list-style-type: none"> <li>• Impervious surfaces                             <ul style="list-style-type: none"> <li>○ Parking lots</li> <li>○ Roads</li> <li>○ Building roofs</li> </ul> </li> <li>• Lawns and Landscaping                             <ul style="list-style-type: none"> <li>○ Fertilizers</li> <li>○ Herbicides &amp; pesticides</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Buffers can provide filtering</li> <li>• Buffers can provide treatment, depending on width and vegetation</li> <li>• Route all new, untreated runoff away from resource</li> <li>• Limit use of chemicals for vegetation/native plants/integrated pest management.</li> </ul>
Lights	<ul style="list-style-type: none"> <li>• Parking lots</li> <li>• Street lights</li> <li>• Building lights</li> <li>• Car lights</li> </ul>	<ul style="list-style-type: none"> <li>• Buffers can interrupt and reduce, if adequate width and vegetation cover</li> <li>• Direct lights away from resource</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Roads</li> <li>• Residential areas</li> <li>• Parks</li> <li>• Commercial and Public areas</li> <li>• Manufacturing processes</li> </ul>	<ul style="list-style-type: none"> <li>• Buffers can interrupt and reduce, if adequate width and vegetation cover</li> <li>• Locate activity that generates noise away from resource</li> </ul>
Predation from pets	<ul style="list-style-type: none"> <li>• Residential areas</li> </ul>	<ul style="list-style-type: none"> <li>• Buffers are effective only if they are large enough to provide refuge and reduce the predator to prey interactions</li> <li>• Buffers can provide habitat for predators like coyotes that reduce domestic animal intrusion</li> <li>• Fence buffers and resources</li> <li>• Fence or otherwise limit pet access to resources and buffers</li> </ul>
Dust	<ul style="list-style-type: none"> <li>• Construction sites</li> </ul>	<ul style="list-style-type: none"> <li>• Buffers can interrupt and reduce, if adequate width and vegetation cover</li> <li>• Use best management practices to control dust.</li> </ul>

In an urban setting, the range of activities adjacent to a resource may affect the size or character of a buffer. Higher intensity uses generally have greater impacts, although design can make a substantial difference in impacts. For example, large warehouse or industrial buildings adjacent to buffers with wall density sufficient to be a barrier to noise and no windows or exterior lighting may have less of an impact than residential use. Open space uses can vary greatly in proximity impacts. Active sports fields, for example can introduce high levels of noise and light as well as impacts from chemical fertilizers, herbicides and pesticides. Predation of wildlife by domestic animals is difficult to address by buffer size, no matter how extensive. Buffers also may become habitat for ferial domestic animals. In such a case, controls on domestic animals, such as fencing may be needed in addition to buffers.

The character of buffer vegetation is also a key element of ecological functions and attenuation of proximity impacts of human use. The edge vegetation of native forests at a boundary such as a meadow, or an area cleared by humans typically reaches the full length of threes. This contrasts markedly with the interior of a stand of native evergreens that typically have lost most of their lower branches due to shading. A cleared native forest buffer has very little vegetation near the ground and provides little effect on proximity impacts from adjacent development such as light or the view of adjacent development that may deter use by wildlife. An example of the difference between a natural forest edge and a recently cleared second-growth forest are provided in Figures 6-1 and 6-2.

It is important to acknowledge that buffers cannot mitigate all effects of human land uses, on a landscape level. A range of human uses alter the movement and storage of surface water and groundwater within a wetland’s contributing basin. Stormwater management programs are essential to control the amount of surface water runoff as well as to assure high water quality.



Figure 6-1. Natural Forest Edge



Figure 6-2. Forest Edge of Cleared Forest

## 6.2 “NO HARM” REGULATORY SYSTEM

This type of regulatory system is best known in Washington State in its application to agricultural use in Skagit County. The approach was endorsed in challenges heard by the Growth Management Hearings Board for Western Washington and the Washington State Supreme Court (*Swinomish v Skagit* 2006). The “no harm” approach may be regarded as an “adaptive management” approach to protecting critical areas. As provided in the GMA regulations, in this approach critical areas regulations are “treated as experiments that are purposefully monitored and evaluated to determine whether they are effective and, if not, how they should be improved to increase their effectiveness.” (WAC 365-195-920(2)).

In determining that the requirement under the GMA to “protect” critical areas is met when local governments prevent new harm to critical areas in reference to protecting fish habitat in agricultural areas the Growth Management Hearings Board and the court both agreed that elements essential to such a program include adequate monitoring, benchmarks, and the ability to require changes to the program if benchmarks are not achieved. In assessing the difference between a prescriptive approach such as buffers and a “no harm” approach, the court held that local governments must either be certain that their critical areas regulations will prevent harm or be prepared to recognize and respond effectively to any unforeseen harm that arises.

Implementation of a “no harm” approach in undeveloped portions of the Black Diamond Urban Growth Area (UGA) are not likely to be effective in allowing future development. It would be difficult to meet a “no harm” standard in the conversion of second growth forests to a variety of urban uses. The application of a “no harm” standard to existing uses and land use patterns is more practical. Such an approach has been included in regulations recently adopted by the City of Black Diamond. Such programs also may include provisions to



provide for enhancement of functions in future redevelopment of existing uses as is provided for in RCW 36.70A.020(10), RCW 36.70A.172 and RCW 36.70A.020(8).

A “no harm” system also is likely to be much more difficult and expensive to implement, especially the monitoring component, and provides little certainty to applicants of the standards likely to be imposed on their development.

### **6.3 GEOLOGICAL HAZARDS**

The options for regulating geological hazards vary primarily in the degree of specificity of regulation. In general, the greater the specificity the more likely risk will be avoided or reduced.

Each option addresses the following criteria:

- Designating and classifying the hazard areas.
- The information needed to assess risk on a specific site.
- The range of options for avoiding risk.
- Allowing individuals to determine the risk they are willing to accept.
- Specifying restrictions on the types of developments; largely aimed at reducing exposure to uses involving risk to human life, especially large groups in uses such as schools or assembly facilities. The most successful and ultimately least costly protection from geologic hazards is often avoidance of known hazardous areas. This includes activities on adjacent areas that may result in an increased failure hazard that moves off site, down slope, or downstream.
- Reducing the exposure of occupied buildings through requirements for building setbacks, buffers, and vegetation management, as well as adherence to building codes; and development of monitoring and warning systems, evacuation plans, and recovery plans.
- Reducing secondary effects to other resources, such as fish, through limiting activities that result in discharge of materials into water bodies or other effects that may damage habitat.

### **6.4 FREQUENTLY FLOODED AREAS**

Only Rock Creek upstream of Roberts Road (Auburn Black Diamond Road) has been designated a floodplain in studies prepared by the Federal Emergency Management Agency (FEMA). Flooding of this area is affected to some extent by the capacity of the existing Roberts Road Bridge. The floodplain area is largely contained within the wetland and proposed buffer area associated with Rock Creek and does not warrant separate protection.

### **6.5 CRITICAL AQUIFER RECHARGE AREAS**

Three factors generally dominate determination of aquifer susceptibility (Cook 2000):

- Overall permeability of the unsaturated zone (soil and underlying geologic strata);
- Thickness of the unsaturated zone (depth to groundwater in unconfined aquifers); and
- Amount of available recharge.

Data already compiled and described above appear sufficient to support determination of aquifer susceptibility and vulnerability in the City of Black Diamond. Aquifer recharge areas may be identified largely by surficial soils and categorized for sensitivity based on "DRASTIC - A Standardized System for Evaluated Groundwater Pollution Potential Using Hydrogeologic Settings" (Aller et al. June 1987, US Environmental Protection Agency, Publication Number 600287035).

Wellhead protection areas (WHPAs) designated by water purveyors (as required by WAC 246-290-145) and mapped by Ecology (2006) should be added to the City's aquifer recharge area map, showing the 10-year ground-water travel-time area to each well or well field. Superposition of all designated WHPAs illustrates where aquifers are currently used for water supply. The mapping should be updated periodically to allow for additions and deletions of specific water wells. These data should be checked with State of Washington Department of Health and King County Health Department records.

## 7. SUMMARY

### 7.1 FINDINGS

The following findings summarize the discussion above and in the more detailed analysis in the Technical Appendixes on individual resources:

1. The majority of Black Diamond and its Urban Growth Area (UGA) are located in the Lake Sawyer subwatershed. Lake Sawyer is an extremely sensitive resource due to its large water area and small tributary watershed. It is especially sensitive to eutrophication from additional nutrients.
2. The streams and lakes in the area provide important habitat for anadromous fish, resident fish, other aquatic species and a range of terrestrial species.
3. Due to the largely undeveloped status of the UGA, many of these resources have relatively intact riparian areas, extensive wetlands, and relatively good water quality and instream habitat. Additionally, many of these areas provide numerous process-intensive functions that contribute to the overall productivity of the subwatershed. The maintenance of these functions throughout the UGA will be essential to maintaining ecological functions and values within Lake Sawyer. The lake has a relatively small watershed and will be extremely sensitive to changes brought on by urbanization.
4. The processes that occur within the City and its UGA have a relatively smaller impact on the larger Green River/Soos Creek/Covington Creek watershed simply because it is a small contributing area.
5. The processes that occur in the portion of the UGA in the Middle Green River/Crisp Creek watershed primarily are related to groundwater recharge. The City and its Urban Growth Area provide fewer process-intensive functions contributing to the overall productivity of that subwatershed, but may be important to processes that occur in the nearby Horseshoe Lake and possibly Keevie Lake.
6. The Rock Creek/Jones Lake/Jones Creek corridor has the largest concentration of sensitive features that affect landscape function, including a large complex of wetlands that provides flood desynchronization, water storage, and a variety of nutrient control functions essential to the health of the watershed and provide the most important aquatic and terrestrial habitat areas. This area has the potential to provide the greatest

beneficial effects on Lake Sawyer water quality, in addition to control of nutrients at the source.

7. Black Diamond Lake and the associated stream has a large and important concentration of similar features, including a large wetland complex, but is currently somewhat less important currently due to the smaller tributary watershed. As the area urbanizes, it will be increasingly important in providing water storage, and a variety of nutrient control functions essential to the health of the Lake Sawyer watershed.
8. Large wetland complexes that provide the headwaters of many streams are important in water storage and maintaining year round stream flows and temperature moderation. Such wetland complexes are present in the headwaters of Ginder Creek, Lawson Creek, Jones Creek, and Mud Creekn as well as the Rock Creek tributary to the Cedar River.
9. Tributary streams in the area have a variety of gradients and flow conditions as well as varying degrees of human alteration. Generally they are less important in providing aquatic and wildlife habitat, but they are important in providing inputs of high quality low temperature water to the systems with the greater concentrations of landscape functions.
10. Terrestrial habitat in the Black Diamond UGA is extensive due to the largely undeveloped character of the area. Preservation of wildlife habitat and corridors can be accomplished in concert with preservation of the Rock Creek/Jones Lake/Jones Creek and Black Diamond Lake/Stream areas with extension of the corridors to the north to Ravensdale Creek and to the east and west UGA boundaries. Wildlife corridors will be enhanced by providing passage under major roads by enhancing crossings of water bodies to provide bridges with additional height and width for animal movement.
11. Frequently flooded areas in the Black Diamond UGA are contained within the recommended stream and wetland buffer areas of the core Rock Creek/Jones Lake/Jones Creek corridor and do not warrant separate regulation.
12. Geologic hazards of landslides, erosion hazards and seismic hazards are relatively limited in scope and can be addressed on a case-by-case basis.
13. Geologic hazards related to abandoned coal mines are of concern in Black Diamond due to its history of coal mining. Coal mine hazards relate primarily to depth of workings and the presence of openings. Generally deeper workings have the least hazard with shallow workings posing the greatest risk. Coal mine hazards can generally be addressed by site specific studies and mitigating measures.
14. Critical aquifer recharge areas are generally in the moderate risk range based on analysis of soil and geologic conditions and can be addressed by regulation of activities most likely to discharge hazardous materials and through protection of wellhead areas.

## 7.2 RECOMMENDATIONS

Regulatory implications of these findings leads to a recommendation that the City of Black Diamond take an approach that provides the highest level of protection for the most important areas of the city that contribute the most to current ecological functions. This would be accompanied by a lower level of protection for those specific sensitive area resources in specific contexts where they contribute less to key functions. By this focused approach, the city is likely to be successful in preserving key ecological functions while accommodating growth goals.

Key elements of this approach include:

1. The Rock Creek/Jones Lake/Jones Creek corridor and the Black Diamond Lake/Stream corridors and the associated wetland complexes should be recognized as a core area that provides a variety of water supply, water quality, and habitat functions. These functions are essential to the preservation of water quality in Lake Sawyer, and to continue to provide the rich ecological functions of these systems. To function as wildlife corridors, they should extend to Ravensdale Creek to the north and the UGA boundaries to the east and west. They should be preserved with a minimum buffer width of 225 feet and requirements for adjacent uses to incorporate measures to reduce proximity impacts from noise, light and glare, stormwater and predation from pets. These corridors also should extend to the boundaries of adjacent steep slopes and may be widened where possible through a transfer of a portion of the buffer area from lower priority stream complexes.
2. Large wetland complexes at the headwaters of Ginder Creek Lawson Creek, Mud Creek and the Rock Creek tributary to the Cedar River that provide important inputs of water to the core many streams should be preserved with buffers of 225 feet.
3. Wetlands outside of the core wetland complexes and the headwaters of Ginder Creek and Lawson Creek provide important hydrologic functions. Their ability to provide productive wildlife habitat for a variety of species will be limited by future urbanization. It is appropriate for the city to recognize tradeoffs between Urban Growth area goals of providing for housing and economic development by lower standards of protection. In recognition of their lower productivity, opportunities for transfer of buffer area to the core wetland system also are appropriate to provide the greatest variety of functions in that central location.

Recommended buffers are found in Table 7-1:

**Table 7-1. Recommended Wetland Buffers**

Wetland Category	CORE and Headland	Standard Buffer	Minimum Buffer with Transfer to Core Wetland Complex
Category IV	225 feet	50 feet	30 feet
Category III	225 feet	80 feet	50 feet
Category II	225 feet	150 feet	100 feet
Category I	225 feet	180 feet	125 feet

These buffer reductions, however, should be considered only when adjacent lands and adjacent development have appropriate natural and built features to protect wetland functions. These should include:

- (a) The buffer must have topographic and vegetation characteristics that ensure adequate function, including intact soils, limited topographic slope and dense native vegetation, including understory.
- (b) Adjacent land use should not include high intensity uses such as commercial, industrial or high intensity multi-family and also should avoid high intensity recreational uses such as sports fields that have considerable loadings of fertilizers and other chemicals and also bring large groups of people into close proximity to the resource.

- (c) Adjacent development should control impacts on the resource that will not be addressed by buffer width, including:
- Runoff control generally should not include discharge to or across the buffer. Infiltration or other low impact development mechanisms should be employed.
  - Setbacks of buildings, parking areas, road and driveways from the buffer should be employed to provide additional areas for distance attenuation of proximity impacts that may be devoted to low intensity uses such a yards.
  - Noise and light and glare should be limited by building placement and design, including avoidance of windows facing the buffer, avoidance of outdoor and security lighting, placement of mechanical and ventilating equipment away from the buffer and planting a dense vegetative screen at the margins of the buffer.
  - The buffer should be fenced to limit intrusion of domestic animals and disturbance from informal human use and to also to attenuate noise and light and glare intrusion.
4. Small isolated wetlands often provide few functions when surrounded by urban development. Such wetland should be considered for displacement, if mitigation includes improving functions of wetlands and buffers in the core wetland/stream corridor.
5. Streams outside the core complex should be protected to continue to provide high quality water and fish habitat, where available.

Recommended buffers for streams and lakes outside the core complex are shown in Table 7-2:

**Table 7-2. Recommended Stream and Lake Buffers**

Type	Standard Buffer	Minimum Buffer with Transfer to Core Wetland Complex
<b>Type S</b> - all waters, as inventoried as "shorelines of the state" under the jurisdiction of the Shoreline Management Act, except associated wetlands,	200 feet	150 feet
<b>Type F</b> - segments of natural waters other than Type S Waters, which are greater than 10 feet in width	150 feet	100 feet
<b>Type Np</b> - segments of natural waters that are perennial non-fish habitat streams. - 75 feet	100 feet	50 feet
<b>Type Ns</b> - segments of natural waters within defined channels that are seasonal, non-fish habitat streams	50 feet	30 feet

Buffer reductions, however, should be considered only when adjacent lands and adjacent development have appropriate natural and built features to protect wetland functions. The elements outlined above for buffer reduction for wetlands should also be implemented for these buffer reductions.

7. Geological hazards should be recognized and addressed on a case by case basis. Where feasible, slopes adjacent to wetlands and streams should be incorporated into buffers to provide a more effective overall buffer system.
8. Coal mine hazards should be recognized. High risk areas should be left undeveloped, unless mitigation can assure the reduction of risk to acceptable levels. Public facilities generally should avoid high risk areas. Lower risk areas should be assessed to assure that risks are mitigated, including risks to buildings from settlement.
9. Critical aquifer recharge areas are generally in the moderate risk range and can be effectively addressed by regulation of activities most likely to discharge hazardous materials and through protection of wellhead areas.
9. To recognize existing lots that cannot comply with the recommended buffers. Provisions are made for:
  - Allocation of a certain amount of disturbance as a “reasonable use” for existing residential lots
  - A broader “reasonable use” provision reviewed on a case-by-case basis for other uses
  - A sliding scale based on lot depth for buffers
  - Provision for enhancement of setbacks and buffers to reduce impacts to adjacent resources. As properties are re-developed, provisions should be included to enhance buffers.

## 8. REFERENCES

References are found in the accompanying Technical Appendixes to this summary.