

**AGENDA  
CITY OF SHORELINE PLANNING COMMISSION  
REGULAR MEETING**

Thursday, January 20, 2005  
7:00 P.M.

Shoreline Conference Center  
Board Room  
18560 – 1st Ave NE

- |                           | <u>Estimated Time</u> |
|---------------------------|-----------------------|
| 1. CALL TO ORDER          | 7:00 p.m.             |
| 2. ROLL CALL              | 7:02 p.m.             |
| 3. APPROVAL OF AGENDA     | 7:04 p.m.             |
| 4. APPROVAL OF MINUTES    | 7:06 p.m.             |
| a. November 4, 2004       |                       |
| b. November 18, 2004      |                       |
| 5. GENERAL PUBLIC COMMENT | 7:10 p.m.             |

The Planning Commission will take public testimony on any subject which is not of a quasi-judicial nature or specifically scheduled for this agenda. Each member of the public may comment for up to two minutes. However, Item 5 (General Public Comment) will be limited to a maximum period of twenty minutes. Each member of the public may also comment for up to two minutes on action items after each staff report has been presented. The Chair has discretion to limit or extend time limitations and number of people permitted to speak. In all cases, speakers are asked to come to the front of the room to have their comments recorded. Speakers must clearly state their name and address.

- |   |           |
|---|-----------|
| 6. STAFF REPORTS  | 7:15 p.m. |
| a. Workshop to Discuss Critical Areas Ordinance Update            |           |
| 7. REPORTS OF COMMITTEES AND COMMISSIONERS                        | 9:25 p.m. |
| 8. UNFINISHED BUSINESS  | 9:28 p.m. |
| 9. NEW BUSINESS   | 9:30 p.m. |
| 10. ANNOUNCEMENTS   | 9:32 p.m. |
| 11. AGENDA FOR February 3, 2005                                   | 9:34 p.m. |
| a. Revisiting Drift On Inn Special Use Permit (Off-Track Betting) |           |
| b. Workshop: Comp Plan Site Specific Changes                      |           |
| 12. ADJOURNMENT   | 9:40 p.m. |

The Planning Commission meeting is wheelchair accessible. Any person requiring a disability accommodation should contact the City Clerk's Office at 546-8919 in advance for more information. For TTY telephone service call 546-0457. For up-to-date information on future agendas call 546-2190.

This page intentionally left blank

# **CITY OF SHORELINE**

## **SHORELINE PLANNING COMMISSION SUMMARY MINUTES OF REGULAR MEETING**

November 4, 2004  
7:00 P.M.

Shoreline Conference Center  
Board Room

---

### **PRESENT**

Chair Harris  
Vice Chair Piro  
Commissioner Sands  
Commissioner Kuboi  
Commissioner Phisuthikul  
Commissioner MacCully

### **STAFF PRESENT**

Tim Stewart, Director, Planning & Development Services  
Andrea Spencer, Senior Planner, Planning & Development Services  
Jill Marilley, City Engineer, Public Works  
Jerry, Shuster, Surface Water Coordinator, Public Works  
Lanie Curry, Planning Commission Clerk

### **ABSENT**

Commissioner Hall  
Commissioner McClelland

### **1. CALL TO ORDER**

The regular meeting was called to order at 7:08 p.m. by Chair Harris, who presided.

### **2. ROLL CALL**

Upon roll call by the Commission Clerk, the following Commissioners were present: Chair Harris, Vice Chair Piro, Commissioners Sands, Kuboi, Phisuthikul and MacCully. Commissioners Hall and McClelland were excused.

### **3. APPROVAL OF AGENDA**

The Commission unanimously approved the agenda as written.

### **4. APPROVAL OF MINUTES**

There were no minutes available for approval.

## **5. GENERAL PUBLIC COMMENT**

There was no one in the audience who desired to address the Commission during this portion of the meeting.

## **6. STAFF REPORTS**

### **Recommendation to City Council on Comprehensive Plan Update and Master Plans**

Ms. Spencer recalled that the Commission has already formulated their recommendation for the Comprehensive Plan and the Parks Master Plan. However, before approving the Surface Water Master Plan and the Transportation Master Plan, they requested further information and clarification from the staff. She introduced Jerry Shuster, Surface Water Coordinator, and Jill Marilley, City Engineer, who were present to further address the Commission's concerns.

Mr. Shuster referred the Commission to the memorandum he prepared to clarify the City's proposal to use surface water funds to pay for surface water, water quality and habitat projects associated with parks and transportation projects. He explained that when the City works on a road or park project and either the roadway or a portion of the park are torn up, there are opportunities for the City to upgrade some of their old and failing infrastructure in a cost-effective manner. He pointed out in the City of Shoreline surface water is a utility, and other water utilities in the City (water and sewer) are also taking this approach. Mr. Shuster clarified that the surface water dollars would only be used for pipes, catch basins, water quality improvement facilities and habitat issues. The dollars would not be used for concrete for roads, curbs or gutters.

COMMISSIONER KUBOI MOVED THAT THE COMMISSION FORWARD THE DRAFT VERSION OF THE SURFACE WATER MASTER PLAN TO THE CITY COUNCIL WITH A RECOMMENDATION FOR APPROVAL. COMMISSIONER SANDS SECONDED THE MOTION. THE MOTION CARRIED UNANIMOUSLY.

Ms. Marilley reported that the Transportation Work Group had a number of questions they wanted staff to address prior to publication of the Transportation Master Plan. The plan would be published within the next few days after the Commission reaches a resolution, and could be brought to the Commission for a final recommendation at their November 18<sup>th</sup> meeting.

Ms. Marilley recalled that the draft Transportation Master Plan proposed a change in the way the City measured Level of Service from a volume-over-capacity ratio to a delay. She reported that the Transportation Work Group wanted to push this proposal one step further. But due to how quickly the plan was being moved through the review process, the staff and work group were not able to spend the time that was needed to create a Level of Service measure that really takes into account not only vehicular traffic, but also transit and other modes of travel.

Ms. Marilly advised that the work group is proposing that the following policy be added to the Transportation Master Plan:

**“Policy Tw:** The City of Shoreline shall pursue the development of a multi-modal measure for Level of Service that takes into account not only vehicular travel and delay, but transit service and other modes of travel.”

Commissioner MacCully, a Transportation Work Group member, suggested that in order to make it clear that there would be a separate study regarding people-carrying capacity as opposed to vehicular-carrying capacity, another line should be added to the bottom of the matrix on Page 2 of the blue memorandum as follows:

All	Study for new policy Tw			\$50,000
-----	-------------------------	--	--	----------

Commissioner MacCully noted that the amount (\$2,829,000) in the last column of the matrix on Page 2 of the blue memorandum should be adjusted to \$2,779,000 to account for the \$50,000 identified for the study. However, he emphasized that the totals would not be changed. Ms. Marilly clarified that this change is intended to make sure the funding is available to pursue a different form of Level of Service measurement in preparation for the next update of the Transportation Master Plan.

Ms. Marilly explained that when the Transportation Work Group went through the process of prioritizing the projects based on the criteria that was in the draft plan, they were able to create a recommended project list that identified a number of intersection projects on Meridian Avenue North. The Work Group questioned the high number of projects for this street. Instead of identifying actual projects, they agreed that they should be combined into one in order for the City to get the “most bang for their buck.” They discussed that it would be appropriate for the City to conduct a study for the entire Meridian Avenue North corridor. Because the Transportation Plan already identified the need for a corridor study for North 175<sup>th</sup> Street, it became clear that a sub-area transportation study would be the best approach to address both streets.

Ms. Marilly referred the Commission to the revised recommended roadway project list, which was modified to show the impact of combining all of the Meridian Avenue North projects, establishing a study for the sub-area (the combination of North 175<sup>th</sup> Street and Meridian Avenue North), and still apportion out funds to build any of the appropriate improvements that might come out of the study.

Vice Chair Piro added that the Transportation Work Group felt that if they were not comfortable with the current approach to Level of Service, they should not be advancing particular projects on Meridian Avenue North based on that approach. They felt it would be more appropriate to address the issues related to Level of Service first. The Work Group also felt it would be more appropriate to combine both streets into one study as a sub-area review.

Commissioner MacCully thanked the Engineering and Planning Department for being responsive to the concerns that were raised by the Commission.

VICE CHAIR PIRO MOVED THAT THE COMMISSION FORWARD A RECOMMENDATION OF APPROVAL TO THE CITY COUNCIL FOR THE TRANSPORTATION MASTER PLAN, WITH THE ADDITION OF POLICY Tw AND THE MODIFICATIONS TO TABLE 6-4 (CHANGING THE TOTAL ON THE LAST LINE FROM \$2,829,000 TO \$2,779,000 AND ADDING A NEW LINE FOR A STUDY OF LEVEL OF SERVICE AT A COST OF \$50,000). COMMISSIONER MACCULLY SECONDED THE MOTION. THE MOTION CARRIED UNANIMOUSLY.

**7. REPORTS OF COMMITTEES AND COMMISSIONERS**

Vice Chair Piro reported that he attended the Fall Conference for the American Planning Association’s (APA) Division Officers in Portland, Oregon. He reviewed that the APA is working on what they call “two super topics” that they will be devoting time and energy to in their conferences and in their publication of documents and policy guides. There was some discussion on how to do additional outreach with those issues to local planning commissions and planning staff. One issue is related to safety in the built environment, and some of the initial work was to talk about safe neighborhoods, particularly those that are characterized by concentrations of particular population groups to ensure safe movement of people in urban neighborhoods. The other issue they will be working on throughout the next year is affordable housing.

Chair Harris reported that the City Council approved the Ronald Place street vacation with just a few small modifications.

**8. UNFINISHED BUSINESS**

There was no unfinished business scheduled on the agenda.

**9. NEW BUSINESS**

Ms. Spencer reported that the City Council has formed a subcommittee of three (Gustafson, Grace, Hansen) to interview the applicants for the vacant Planning Commission position on November 18<sup>th</sup>. The interviews will be open to the public.

Commissioner MacCully recalled that when the Commission agreed to attach the Central Shoreline Sub Area Plan to the Comprehensive Plan as an appendix, they had asked staff to review the sub area plan again to see if any changes were needed to update the document. Mr. Stewart advised that no changes would be necessary to the sub area plan in order for it to be included as an appendix to the Comprehensive Plan.

**10. ANNOUNCEMENTS**

There were no announcements.

**11. AGENDA FOR NEXT MEETING**

Mr. Stewart reviewed that a workshop on the Critical Areas Ordinance Update is scheduled for the Commission's November 18<sup>th</sup> meeting. Staff plans to review the requirements of State law and provide a presentation that has been put together by CTED. Staff hopes to have a draft available on November 18<sup>th</sup> or shortly thereafter. Once the draft is available, staff will outline a public hearing schedule for the Commission's consideration.

Vice Chair Piro inquired regarding the estimated schedule for sending the Comprehensive Plan and the associated master plans to the City Council for review. Mr. Stewart answered that a City Council workshop has been scheduled in December for this purpose. In addition, the staff plans to present a resolution to the City Council that would extend the date of approval into January or February, as previously discussed by the Commission.

## **12. ADJOURNMENT**

The meeting was adjourned at 7:30 p.m.

---

David Harris  
Chair, Planning Commission

---

Jessica Simulcik  
Clerk, Planning Commission

This page intentionally left blank



**CITY OF SHORELINE**

**SHORELINE PLANNING COMMISSION  
SUMMARY MINUTES OF REGULAR MEETING**

November 18, 2004  
7:00 P.M.

Shoreline Conference Center  
Board Room

---

**PRESENT**

Chair Harris  
Vice Chair Piro  
Commissioner Sands  
Commissioner Kuboi  
Commissioner Phisuthikul  
Commissioner McClelland  
Commissioner Hall

**STAFF PRESENT**

Tim Stewart, Director, Planning & Development Services  
Andrea Spencer, Senior Planner, Planning & Development Services  
Matt Torpey, Planner II, Planning & Development Services  
Dave Pyle, Planner I, Planning & Development Services  
Paul Inghram, Berryman & Henigar

**ABSENT**

Commissioner MacCully

**1. CALL TO ORDER**

The regular meeting was called to order at 7:05 p.m. by Chair Harris, who presided.

**2. ROLL CALL**

Upon roll call by the Commission Clerk, the following Commissioners were present: Chair Harris, Vice Chair Piro, Commissioners Sands, Kuboi, Phisuthikul and McClelland, and Hall. Commissioner MacCully was excused from the meeting.

**3. APPROVAL OF AGENDA**

The Commission unanimously approved the agenda as written.

**4. APPROVAL OF MINUTES**

The minutes of October 21, 2004 were approved as drafted.

## **5. GENERAL PUBLIC COMMENT**

**Janet Way, 940 Northeast 147<sup>th</sup> Street**, referred to the proposed Critical Areas Ordinance that the Commission would be reviewing later in the meeting. She questioned how the ordinance would define fish and wildlife and habitat conservation areas. She recalled that the last time the City reviewed their Critical Areas Ordinance there was a problem because only a couple of creeks were designated as fish and wildlife habitat conservation areas. Many people expressed their concern that other creeks should be included, as well. She suggested that each and every creek should be considered a critical area.

Ms. Way referred to the draft document for best available science and noted that the watershed inventory assessment plans were missing. She said she would hope that WIRA 8 (Lake Washington) and WIRA 9 (Puget Sound) would also be included in the document's bibliography. In addition, the Thornton Creek Watershed Management Characterization Report should be referenced, along with any other characterization reports that are available. She noted that the Lake Forest Park Stewardship Foundation produced a helpful booklet that includes a lot of information related to McAleer Creek, and it has been provided to the City staff for reference. She asked that this document be included in the ordinance, as well as any best available science work that has been completed by Lake Forest Park.

Ms. Way said she is still waiting to obtain a copy of the draft Critical Areas Ordinance, and would like the staff to notify her as soon as it is available. Mr. Stewart clarified that Ms. Way has submitted a public disclosure request to obtain a copy of the draft Critical Areas Ordinance. As soon as the draft is ready for public release, staff would notify Ms. Way. He noted that the Planning Commissioners have not received a copy of the draft document, either.

Mr. Stewart said the WIRA (Water Resource Inventory Area) 8 Conservation Plan arrived in his office just this week and is dated November 12<sup>th</sup>. The document he received is the public review draft, and it contains a wealth of information. Staff will carefully review the document as they finalize the draft Critical Areas Ordinance Update since the entire City of Shoreline is within WIRA 8, which covers Puget Sound, as well. Mr. Stewart reported that a series of open houses and meetings have been scheduled for the WIRA 8 Conservation Plan. A Commissioner pointed out that the document is scheduled for adoption by June of 2005. Mr. Stewart advised that the City of Shoreline has helped fund the plan, and they anticipate using it. He explained what would be included in the WIRA 8 Conservation Plan.

Commissioner Hall inquired if the staff has a comprehensive list of the documents the City is using for the Best Available Science Report and the Critical Areas Ordinance Update. Mr. Inghram said there is a collection of lists available. He referred to the draft Best Available Science Document that was put together last year and used by the Surface Water Environmental Work Group when reviewing the environmental policies as part of the Comprehensive Plan Update. It includes a bibliography of a variety of scientific documents. In addition, the Surface Water Management Plan references other documents. He explained that the list that was provided to the Commission identifies the main references that were used for the current draft. Lastly, he noted that the King County Best Available Science Document provides an extensive bibliography that branches out to other documents.

## 6. STAFF REPORTS

### A Workshop Overview of Critical Areas Ordinance Update Requirements and Preliminary Draft Best Available Science Listing

Mr. Stewart briefly reviewed that CTED has been providing the staff and consultants with technical assistance and guidance on preparing the Critical Areas Ordinance Update. He said that during their presentation, the staff and consultant would provide background information and allow the Commissioners to ask questions. He advised that various policy issues are being reviewed by the City as part of the Stormwater Management Plan and Comprehensive Plan Update process, and these policies could have an influence on the Critical Areas Ordinance. Staff is working to develop an ordinance that is reflective and consistent with the policy direction that the Commission has provided.

Mr. Stewart said staff is also acutely aware of other things that are going on in the region. For example, the King County Council recently adopted their critical areas ordinance, but it has been or will be appealed in the near future. As part of their deliberation, the King County Council reviewed a document that was submitted by the Seattle/King County Association of Realtors, which raised issues about buildable lands and whether the adoption of the Critical Areas Ordinance would change or modify the supply and capacity of buildable lands within the County in order to meet growth management goals. This same type of challenge is also underway in the City of Renton, where their SEPA determination for their ordinance is currently under appeal. He referred to a very recent appellant court case involving Island County, which provides specific guidance and direction about how the Critical Areas Ordinance and environmental protection should work in the Growth Management Act's scheme of balancing 14 competing goals. The Commission will discuss this issue further as they get involved in the Critical Areas Ordinance review.

Mr. Inghram briefly reviewed a presentation that was put together by CTED to explain some of the background behind the Growth Management Act (GMA) requirement to protect critical areas and include best available science. He explained that the GMA requires the designation and protection of critical areas, and it also has a clause that says one must include best available science in the development of policies and regulations. The CTED presentation helps to explain what best available science is. He noted that CTED has adopted a series of guidelines in the Washington Administrative Code (WAC) that help explain best available science and how it should be used.

Mr. Inghram advised that the Growth Management Act can be found in Chapter 36.70A of the Revised Code of Washington (RCW). This chapter lists the 14 planning goals of the act, including goals related to economic development, transportation and protection of the environment. The chapter requires that best available science be included in designating and protecting critical areas' functions and values.

Mr. Stewart briefly reviewed the planning goals identified in the Growth Management Act as follows:

- Encourage urban development within a growth area.
- Reduce sprawl.
- Encourage efficient multi-modal transportation.

- Encourage the availability of affordable housing to all economic segments.
- Encourage economic development throughout the state.
- Prohibit the use of private property rights for public use without just compensation.
- Process applications for both state and local government permits in a timely and fair manner.
- Maintain and enhance natural resource based industries, including timber, agriculture and fisheries.
- Provide open space and recreation.
- Protect the environment and enhance the State's environmental quality of life, including air and water quality and the availability of water,
- Encourage citizen participation and coordination.
- Provide public facilities and services.
- Encourage historic preservation.
- Protect the shorelines.

Mr. Stewart emphasized that all of the above mentioned goals are ranked equal, and no one goal would take precedence over another.

Mr. Inghram reviewed that the five types of critical areas that have been identified: wetland areas, fish and wildlife habitat conservation areas, geologically unstable areas, aquifer recharge areas (areas with a critical recharging effect on aquifers used for potable water), and frequently flooded areas. He explained that the GMA states that counties and cities shall include best available science when developing policies and development regulations to protect the function and values of these critical areas. The GMA also states that counties and cities shall give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries. He pointed out that anadromous fish are those that go out to the saltwater and then come back. He said there are a lot of questions inherent in these two statements as to exactly what the term "shall" means. In this case, the cities and counties are required to give substantial consideration to best available science and conservation or protection measures, but they are not being required to act in a specific way.

Mr. Inghram reviewed some of the functions and values that could be considered when protecting critical areas such as: water quality; fish and wildlife habitat for forage, breeding, and movement; food chain support; flood storage conveyance and attenuation; ground water recharge and discharge areas; erosion control; protecting humans from natural hazards; historical and archaeological values; aesthetic values and education opportunities.

Mr. Inghram advised that the guidelines adopted by the State provide local governments with specific direction as to the types of science they should look at. They provide some warning signs to use when determining if information should be included as best available science or not. They include the following:

- Information that is irrelevant and/or unreliable.
- Variables overlooked or ignored.
- Lack of helpful standards of reference.
- Inadequate sample size and biased sample collection.

- Lack of peer review or publication.
- Expert witness' lack of educational background and training.
- Observer bias and vested interest and assumptions.
- Conclusions based on personal stories or anecdotal evidence.

Mr. Inghram summarized the Best Available Science Guidelines that are outlined in the WAC. WAC-365-195-900 explains the statutory context and purpose of the rules and WAC-365-195-905 explains what best available science is and how to evaluate the documents and information represented to be scientific. He pointed out that common sources of nonscientific information include: anecdotal information, non-expert opinion and hearsay. He explained that while the guidelines recognize that these may be valuable sources of information and should not simply be discredited, cities and counties must distinguish between non-scientific and scientific information. He reviewed that sources of scientific information include: research, monitoring data, inventory data, survey data, assessment data, modeling data, synthesis of science, and expert opinion. He referred to the list that was provided to the Commission of the different science sources that the staff and consultants have collected such as mapping by the City and the Department of Fish and Wildlife, the science synthesis documents that were prepared by the Departments of Ecology and Fish and Wildlife, and science documents that were prepared by King County and other agencies.

Mr. Inghram emphasized that sources of information must be the product of a valid scientific process including some or all of the following characteristics: a peer review, clearly stated methods, conclusions that are based on logical assumptions and reasonable inferences, a statistical analysis, an established context, cited references that are supported by relevant and credible literature and other pertinent existing information.

Mr. Inghram advised that WAC-365-195-910 offers recommendations as to where governments can obtain the best available science and evaluate the information. He explained that since the adoption of the guidelines, CTED has produced a document titled, "Citations of Best Available Science," which is a booklet that includes a list of potential sources of best available science. He said it is important to note that State agencies with expertise constitute a possible best available science source.

Mr. Inghram explained that local governments can compile scientific information through their own efforts, through the public process and through state agency review. He noted that the City has done some of this through the stream inventory and the draft Best Available Science Report that was prepared in 2003. Local governments may also use information that local, state or federal natural resource agencies have determined represents best available science. In addition, CTED provides a list of resources that state agencies have identified as meeting the best available science criteria.

Mr. Inghram reviewed that WAC-365-195-915 provides criteria for demonstrating that best available science has been included in the development of policies and regulations. It also explains the importance of justifying any decision to depart from science-based recommendations and describes actions that could be taken to address potential risks to a critical areas function. If the City wants to do something completely different than what science says, they must evaluate the risks and compensate in some fashion. He further reviewed that WAC-365-195-920 explains what cities and counties can do if

they cannot find enough scientific information applicable to a critical area. It specifically recommends a precautionary approach using an adaptive management plan, a budget and a timeline for reevaluating the potential protection measures later.

Mr. Inghram referred to WAC-365-195-925, which explains what it means to give special consideration to the protection of anadromous fisheries. It suggests that conservation and protection measures considered by local jurisdictions should include the complete life stages of fish and the different functional requirements for habitat such as stream flows, water temperature and quality, areas for spawning, migratory access, etc.

Mr. Inghram said that once the various scientific recommendations have been absorbed, local jurisdictions must then figure out how to apply the information in their land use management strategies and critical areas regulations. CTED advises that it is important to first understand the functions that need to be protected and then determine how the functions or the human risks are impacted by land disturbances. Next, cities and counties should evaluate the accumulative effects of zoning decisions on the critical areas functions and values. Finally, they will be able to develop performance measures that are expected from development interests. There is an expectation that the proposed regulations would have specific restrictions, prohibited uses, buffers, etc. He said the performance measure that should be considered for aquifer recharge areas is limiting hazardous materials within these critical areas. In steep slopes and landslide areas a geotechnical assessment should be required, along with setting back development away from the areas of greatest hazard. In fish and wildlife conservation areas, typically, buffers are used to protect riparian areas. Habitat function should include consideration of multiple species of habitat, breeding, feeding, nesting and migration needs. In addition, buffers protect these areas from human-caused impacts. State agencies are often recommending buffers of between 50 to 200 feet.

Mr. Inghram advised that buffers are common tools that counties and cities use to protect their critical areas. The size of the buffer is typically related to the function it is intended to perform. A larger buffer would usually provide a greater function. Open space corridors are significant in that isolated, limited buffers are not as effective as buffers that provide a contiguous corridor. Buffer averaging is often used in communities as a way to adapt a buffer to a specific site by increasing it in one area while reducing it in another. He said it is important for the City to encourage development to first look at ways to avoid and minimize impacts through mitigation sequencing. He said it is also important that the City have a program for requiring maintenance and monitoring of impacts to ensure that mitigation is successful. As with any zoning regulation, there must be an enforcement tool in place.

Mr. Inghram went on to describe the additional performance measures for frequently flooded areas. He said there are definitely situations of flooding in Shoreline, although it is different than what is identified in the CTED presentation. He said that, typically, frequently flooded areas are protected through the more traditional FEMA-based flood hazard regulations. However, he pointed out that there are very limited areas in Shoreline that have been mapped by FEMA as flood hazard areas. These impacts can sometimes be addressed by creating building restrictions for flood areas, by elevating building height, and by creating land use and zoning restrictions. He concluded that there are some very narrow FEMA

flood plains along some of the creeks in the City, but they are essentially down inside the ravine areas where they do not typically interact with any of the City's land use decisions.

Commissioner Phisuthikul inquired if the State has established guidelines for measuring the buffer distance requirements. If so, is the City required to follow this standard. Mr. Inghram answered that the State provides some guidance in their Critical Areas Assistance Handbook and some of the documents from the Department of Ecology also provide some suggestions about buffer distances as well as some of the tools that can be used. He explained that the strict requirements of GMA mandate that cities and counties designate and protect critical areas. The rest of the State information provides guidance to help them accomplish this requirement. Commissioner Phisuthikul summarized that the City of Shoreline has the ability to come up with its own buffer averaging method. Commissioner McClelland agreed but reminded the Commission that whatever they decide must be based on best available science.

Vice Chair Piro summarized that the State establishes a directive for cities and counties to follow and then they provide them with the resources to implement the directive. The notion is that local governments are best equipped to work through these types of issues. In addition, future Hearings Board and court cases will give further definition for cities to follow. He pointed out, however, that even though cities and counties have the ability to develop their own standards, the law also requires that the impacts on other jurisdictions be considered to make sure there is compatibility and consistency where they share borders or have common regional issues such as critical areas.

Commissioner Phisuthikul questioned if there are any critical areas found in the waters that are directly off the shoreline within the City of Shoreline that would create the need for a buffer. Mr. Stewart answered that the Shoreline Management Act is part of the Growth Management Act. Commissioner Hall clarified that the legislature passed a law in 1933 that critical areas regulations do not apply within shoreline jurisdiction. The only shoreline jurisdiction the City of Shoreline has is Puget Sound, which results in a 200-foot band of land where the Critical Areas Ordinance would not apply. However, the law requires that protection for any critical areas that are within this band of land must be just as strict as the requirements for critical areas elsewhere in the jurisdiction. If there is no critical area within this band, the fact that it is against the shoreline would not necessarily trigger the Critical Areas Ordinance if it weren't for special consideration for anadromous fisheries or for spawning, eel grass, kelp, etc. These things would likely result in the area being designated as a fish and wildlife habitat conservation area. Mr. Stewart further explained that, generally, the shoreline area that is measured as 200 feet from the high-water mark is covered by the requirements of the Shoreline Management Act.

Mr. Stewart said the Endangered Species Act could also come into play, and this is a more rigorously enforced set of laws than the Growth Management Act. Although Chinook Salmon would be covered by special consideration for anadromous fisheries, the Endangered Species Act identifies a whole different set of issues regarding the taking of protected species. The City must be cognizant of the Endangered Species Act requirements as they create their Critical Areas Ordinance. Commissioner Sands pointed out that the requirements that are being considered for the Critical Areas Ordinance are not nearly as stringent as the requirements of the Endangered Species Act. If an endangered species is located in a critical area, the Critical Areas Ordinance would be completely overridden by the Endangered Species Act, which is much more protective.

Commissioner Phisuthikul said one could also look at the shoreline as a potential geologically critical area because the flatland near the shoreline could be subject to a tsunami. He noted that there is a known fault line running through Puget Sound, so any of this shoreline area would be subject to tsunami dangers. Mr. Stewart agreed.

Commissioner Kuboi questioned how the Commission could balance what best available science might call for against the needs and requirements of the other competing GMA goals and policies. How can they get everyone to understand that there are other interests that must be considered without having to fight the issue out in court? Mr. Inghram said all jurisdictions in the region have been struggling with the issue of balancing all of the GMA goals. He pointed out that pure science does not provide a precise and easy number for cities to work with. Science tells them that buffers are important for protection, and the state agencies have distilled this down into some recommendations for buffers, but they do not have the ability to simply rely on science to give them the exact answer. There are also competing issues such as constitutional property rights versus environmental protection. The Commission should consider tools that would allow the City flexibility when applying the buffer requirements. For example, buffer averaging and other tools could allow development to occur while still meeting the requirement of protecting the critical areas. He emphasized that the Growth Management Act requires that cities and counties pursue all 14 of the goals at the same time.

Vice Chair Piro expressed his concern that when maps are presented to the public showing where the buffers are and where buffer averaging would and would not be allowed, they could end up potentially fighting over every single area. Once the maps are available, people will realize how the proposed Critical Areas Ordinance would impact their property. He questioned the process and time line that would be used for this process in an attempt to limit the number of appeals.

Mr. Stewart suggested that staff provide each of the Commissioners a copy of the recent appellate court case, *Wean versus Island County*, which was issued on June 7, 2004. He explained that in this case, the appellate court affirmed that local government plans are required to balance the various goals of the Growth Management Act as set forth in the Revised Code of Washington. He said the City Attorney has advised that the general rule identified in this court case is that local governments must consider and evaluate all of the GMA goals. As part of the City's evaluation, they must consider best available science to understand how they can protect the functions and values of their critical areas. He said this is not an issue that is unique to the region. Jurisdictions throughout the state are facing similar challenges.

Mr. Stewart explained that before the City could adopt the ordinance, they must provide the State with at least 60 days notice. A public hearing must be conducted by the Planning Commission. The Commission would then evaluate the proposed ordinance and make a recommendation to the City Council. Although not required, typically, the City Council would conduct a second public hearing on the matter. If there is an aggrieved party to the proposed regulations, the adoption could be appealed to the Central Puget Sound Growth Management Hearings Board. The appeal would be based on the claim that the ordinance is not consistent with a particular state law or policy. If the Growth Hearings Board's decision is appealed, it would be sent to the court system for the final decision.



Commissioner McClelland explained that those who participated in the adoption of the GMA saw the wisdom in trying to contain and intensify urban development and preserve the rural lands. She said she also understands that critical areas ordinances are directed towards vacant and undeveloped lands, which could end up reducing the amount of property that is available for development. She recalled that over the years there has been great debate over establishing rural and urban standards. Even if King County can get away with requiring large buffers and that rural property owners preserve 65 percent of their land, this is very different from determining what is appropriate for the undeveloped properties in Shoreline. She suggested that when developing the context for preserving and protecting critical areas as development occurs, they must decide what urban standards are appropriate for the City, the development community and the environmental community. She said it would be helpful if the Commission were able to work with maps and inventories of the City so that they have a clear picture of what properties would be most impacted by the Critical Areas Ordinance. She suggested that the City consider the option of hiring a consulting firm to conduct a landscape analysis to identify the properties that are protected by critical areas requirements.

Mr. Stewart explained that even though the City of Shoreline is highly built out and very urbanized, they are not relieved from the responsibility of protecting the existing critical areas functions and values. For example, there is a current case where an individual with property right on a stream cut down 28 trees. This had an immediate impact on the temperature of the water. There will also likely be run off and other issues as a result of this property owner's actions. He explained that State law requires the City to preserve functions and values of critical areas. However, he argued that not only should the City preserve these values and functions, they should also improve the functions and values where possible and feasible.

Commissioner Hall questioned if the City of Shoreline has designated any species of local importance. Mr. Stewart answered that is what they plan to do. He also inquired if there would be an opportunity for members of the Commission or the public to suggest specific species for consideration. Mr. Stewart answered affirmatively. Commissioner Hall said that while he supports the intensification of urban environments in order to preserve rural environments, he also wants the City to protect the natural amenity values that make Shoreline a better than average place to live, some of which are the remaining pockets of habitat. He said a piliated woodpecker often comes to the ravine behind his home, and he finds this amazing. He pointed out that the law requires the City to give special consideration to certain endangered species, but he suggested that it would be great for the community to help shape these guidelines. Rather than just go through the required checklist, he suggested that the public should be invited to identify the functions, values, species and/or critical areas they care about. This should be done long before a draft is created for a 60-day review.

Mr. Stewart said the City is under State mandate to complete their Critical Areas Ordinance Update by December 1<sup>st</sup>. However, they have also received guidance from the State that if they are not likely to meet this timeline, they should adopt a resolution to identify when the new ordinance would be approved. He advised that the City Council adopted a resolution over a week ago, suggesting that the Critical Areas Ordinance would be adopted by March or April. Staff suggests that the Planning Commission review of the ordinance starting in January. This would enable them to forward the

document to the City Council for review and approval in March and April. Staff is getting reasonably close to releasing a staff draft of the ordinance.

Commissioner McClelland agreed with Commissioner Hall that the public should be invited to provide their comments and ideas prior to a draft ordinance being released for review. She suggested that once the draft ordinance is released, the dynamics of the public comments would become argumentative. She suggested that they ask the public to provide their comments about what they believe makes Shoreline a great place to live. This would provide a soft opening for the public to participate in the process.

Commissioner Phisuthikul said he does not believe the analysis of the Critical Areas Ordinance should be a “popularity contest.” They should not merely vote another species into the document just because one or more people raise a concern. These new designations should be based on scientific information. Commissioner McClelland said the intent of her suggestion was to get the public engaged in a conversation about why the City is reviewing their Critical Areas Ordinance and making it stricter. This would enable the citizens to consider the value of protecting, preserving and enhancing critical areas. The ordinance is designed to force people to protect critical areas. If people protected these areas naturally, the regulations would not be needed, but that is not the case.

Chair Harris said that if the Commission were to engage in a discussion with the citizens regarding the protection of critical areas, he would expect to see the same people who have come forward in the past. He questioned how they could get more individuals to participate in the discussion.

Vice Chair Piro commented that he is intrigued with the concept put forward by Commissioners McClelland and Hall. However, he agreed with Commissioner Phisuthikul’s caution that they should not leave this type of community discussion open ended. He suggested that perhaps a more deliberative process could be established to allow the public to interact in a designation process. They could also identify what people could do on their own to encourage change.

Mr. Inghram said that several comments were made during the Commission’s review of the Comprehensive Plan Update related to this issue, including a fairly detailed letter from a Thornton Creek group. He said that while he doesn’t want to discourage the Commission from taking this further, he also does not want them to forget that some good comment letters have already been submitted on the issue.

Mr. Stewart explained that as part of the City’s hazard mitigation planning efforts, certain types of soils that are subject to very high liquification were identified on the map. In addition, draft maps are supposed to be available from the University of Washington soon. Mr. Stewart suggested that the combination of these soils, although not related to steep slopes, creates a high liquification potential during a seismic event. He pointed out that the situation is particularly hazardous with brick structures. He suggested that the Critical Areas Ordinance could address whether or not these areas should be mapped and designated.

Commissioner Hall left the meeting at 8:25 p.m.

If the City were to put buffers around the streams and draw the buffer lines on the maps, Commissioner Sands questioned if this would create non-conforming uses of all of the properties that fall within the buffer area. Mr. Stewart answered affirmatively. Commissioner Sands summarized that if an owner of property within the buffer wanted to modify his/her home, it must be done in compliance with the Critical Areas Ordinance. He emphasized that the proposed ordinance would be applicable to more properties than just those that are undeveloped. Mr. Stewart explained that any pre-existing non-conforming use would be allowed to continue. However, a property owner would not be permitted to expand the non-conformity.

Commissioner Phisuthikul pointed out that, on the other hand, best available science could prove that the expansion of the reasonable use of a non-conforming structure would be justifiable. For example, if a property is designated as a geologically hazardous area because of its steep slope, a property owner could hire a geological engineer to review the property using best available science. It is possible that this review could result in the finding that the proposed expansion of use would not further impact the environment. Mr. Stewart agreed and said that is why it is important to focus on the function. He referred to an example of a non-conforming parking lot that is located within a buffer area, with 100 percent sheet runoff picking up all of the pollution and dumping it into the stream. If a proposal were submitted to remove the sheet runoff, enhance the buffer, plant it with natural materials, and provide stormwater retention and water quality improvements, then the function of the new development would end up enhancing the function and value of the resource. In this case, doing nothing would be worse than allowing redevelopment.

Vice Chair Piro said he would forward copies of some of the recent Hearings Board cases to the staff. These cases challenge jurisdictions that even though they have to take their Critical Areas Ordinances seriously, it does mean they can back off of their obligation to accommodate development. He said several jurisdictions have recently been put on notice that they cannot use critical areas as a reason for not going to a density at or below that set by the Growth Hearings Board.

Mr. Stewart said that staff had originally anticipated this issue being discussed by the Commission at their two meetings in December. However, he suggested that they wait until January to start their review of the ordinance. This would enable the staff more time to work on the draft ordinance and collect effective maps to help the Commission in their review. They will also carefully watch what happens with appeals on other jurisdictions' ordinances.

Commissioner Sands said he recently read Bainbridge Island's Critical Areas Ordinance, and he suggested that the staff review this document, as well. He reported that they are just entering their public hearing process.

## **7. REPORTS OF COMMITTEES AND COMMISSIONERS**

None of the Commissioners provided additional comments during this portion of the meeting.

## **8. UNFINISHED BUSINESS**

Mr. Stewart announced that a City Council Workshop Meeting is scheduled for December 6<sup>th</sup> on the Comprehensive Plan and Master Plans. He said the City Manager has suggested that it would be helpful to have members of the Commission present at the meeting to talk about some of the major issues they struggled with. It is likely that the City Council hearings will not take place until January. Ms. Spencer said she would provide talking points for Commissioners on some of the key issues, such as the Central Shoreline Sub Area Plan, the new transportation policy to encourage multi-modal transportation, etc. Mr. Stewart added that the Commission representatives would be given an opportunity to present the staff report in their own words.

Mr. Stewart reported that a subcommittee of the City Council is in the process of interviewing the applicants for the vacant Planning Commission position. Staff is anticipating that the subcommittee would make a recommendation to the full City Council at their next meeting.

Mr. Stewart said the cottage housing issue would be coming before the Commission in the near future. The staff is working on a process for possible community outreach. The current cottage housing moratorium would extend into February or March. Commissioner Kuboi inquired if the City has received any negative comments from the development community regarding the moratorium. Mr. Stewart said the response from the applicant who had been proposing the development is that he would now submit an application for a straight subdivision with eight units.

## **9. NEW BUSINESS**

There was no new business scheduled on the agenda.

## **10. ANNOUNCEMENTS**

There were no additional announcements provided during this portion of the meeting.

## **11. AGENDA FOR NEXT MEETING**

The Commission agreed to cancel both of their regularly scheduled meetings in December. They agreed to hold a holiday event on December 16<sup>th</sup>, and details would be emailed to each of the Commissioners.

The Commissioners had no additional comments to make regarding the agenda for future meetings.

## **12. ADJOURNMENT**

The meeting was adjourned at 8:45 p.m.

---

David Harris  
Chair, Planning Commission

---

Jessica Simulcik  
Clerk, Planning Commission

This page intentionally left blank

**PLANNING COMMISSION AGENDA ITEM**  
CITY OF SHORELINE, WASHINGTON

<p><b>AGENDA TITLE:</b> Workshop to Discuss Critical Areas Ordinance Update</p> <p><b>DEPARTMENT:</b> Planning and Development Services</p> <p><b>PRESENTED BY:</b> Timothy M. Stewart, Director, Planning and Development Services Matthew Torpey, Planner II</p>
--

**EXECUTIVE SUMMARY**

Attached is the Preliminary Draft to amend the existing Critical Areas Ordinance (CAO) section of the Shoreline Municipal Code. The amendments are the final step of updates to the critical areas as required by the Growth Management Act (GMA).

Previously, the Planning Commission held public hearings to review changes to the Critical Areas administration and procedures in the spring of 2003. The administrative and procedural amendments were adopted by the City Council on June 23, 2003 with the adoption of Ordinance #324.

This workshop is the first meeting to introduce the proposed amendments to the Shoreline Planning Commission. No action is proposed to take place at this time. The purpose of this meeting is to introduce the proposed code changes to the Planning Commission at the same time the Preliminary Draft is released to the public and state agencies for review. Staff is available for consultations regarding this draft but the first public hearing at which comment will be taken by the Planning Commission regarding the proposed amendments will be held on February 17, 2005.

The City's CAO was adopted in 2000 using Best Available Science (BAS). That science has been supplemented by the City of Shoreline Stream and Wetland Inventory (May 2004) and the Draft Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Chinook Salmon Conservation Plan (November 12, 2004), the Adolphson Technical Memo dated December 7, 2004 and numerous other publications and documents. Many of those documents are summarized in a technical memorandum produced by Adolphson and Associates (October 2003).

The draft update contains a number of important changes, including:

- Significant increases in stream and wetland buffer requirements, ranging from 15% to 250%.
- Elimination of the disparity in levels of protection between wetlands and streams.
- Significant increases in Wetland replacement and enhancement ratios.

- Clarification of the terms “hazardous tree” and “salmonid fish use”.
- Clarification that Fish and Wildlife Habitat areas are places formally designated by the City of Shoreline, based up a review of BAS and input from the Washington Department of Fish and Wildlife, Washington Department of Ecology and other agencies.
- A new provision encouraging the restoration of piped and denigrated watercourses.
- A new provision allowing for view preservation and enhancement in critical areas and buffers, if a Critical Area Stewardship Plan, which will protect and enhance critical area functions and values, is developed, approved and implemented.
- Amends the definition of “reasonable use”.

All inquiries, questions, and comments in regards to the draft documents may be directed to Matt Torpey, Planner II. City of Shoreline, 17544 Midvale Ave. N., Shoreline, WA 98133. (206)853-4162, or email [mtorpey@ci.shoreline.wa.us](mailto:mtorpey@ci.shoreline.wa.us)

### **STAFF RECOMMENDATION**

No action is required of the Planning Commission at this time This meeting is to introduce the proposed code changes to the Planning Commission and release the changes to the public.

### **ATTACHMENTS**

Attachment I: Critical Areas Questions and Answers

Attachment II: Proposed SMC20.80, Critical Areas

Attachment III: Proposed SMC 20.50, Tree Clearing

Attachment IV: Adolfson Technical Memorandum on BAS



# ATTACHMENT I

**City of Shoreline**

**CRITICAL AREA ORDINANCE (CAO)**

**QUESTIONS AND ANSWERS**

What is a “critical area” and why are we updating our Critical Area Ordinance now?

The Washington State Growth Management Act (GMA) requires cities such as Shoreline to designate and protect critical area such as wetlands, fish and wildlife habitat, flood zones and geological hazards. The state has mandated that Cities and Counties update their CAO’s now.

Was science used in the development of the update?

Yes. The State requires that we “include the best available science in developing policies and development regulations to protect the functions and values of critical areas”. The City’s CAO was adopted in 2000 using Best Available Science (BAS). That science has been supplemented by the City of Shoreline Stream and Wetland Inventory (May 2004) and the Draft Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Chinook Salmon Conservation Plan (November 12, 2004), and numerous other publications and documents summarized in a technical memorandum produced by Adolphson and Associates (October 2003).

What does it mean to “protect the functions and values of critical areas”?

Each type of critical area has functions. For example, one function of deeply rooted tree on a steep slope is slope stability. One function of a tree along a stream is shade (controlling water temperature). Critical areas have multiple functions. For example, each tree would also serve a function for wildlife habitat and a tree along a stream might provide fish habitat as well. It is the protection of the functions of the critical areas of Shoreline that is at the heart of the CAO.

Do the amendments add any protections to streams and wetlands in Shoreline?

Yes. The proposed amendments increase stream and wetland buffer requirements from 15-250%. The amendments also eliminate the disparity in the levels of protection that is now in our CAO between streams and wetlands.

**Existing and Proposed Stream Buffers**

Type	Standard Buffer Width (ft)	Minimum Buffer Width (ft)
Type I	150	<del>100</del> 115
Type II	<del>100</del> 115	75
Type III	<del>50</del> 65	<del>25</del> 35
Type IV	<del>25</del> 35	<del>10</del> 25

## Existing and Proposed Wetland Buffers

Type	Standard Buffer Width (ft)	Minimum Buffer Width (ft)
Type I	150	<del>100</del> <u>115</u>
Type II	<del>100</del> <u>115</u>	<del>50</del> <u>75</u>
Type III	<del>50</del> <u>65</u>	<del>25</del> <u>35</u>
Type IV	<del>10</del> <u>35</u>	<del>10</del> <u>25</u>

Why are we increasing the buffers for streams and wetlands?

The best available science documents and the WRIA 8 report support the proposed changes.

If I have a legally existing home or other building that is located within the new expanded buffers will I have to move it?

No. Legally existing uses may continue and may be replaced if destroyed.

If I want to build a new room on my house that would encroach into the buffer, could I?

New development will be prohibited in critical areas and their buffers, however if a property is completely encumbered by critical areas or their buffers, a person can seek relief through a critical areas reasonable use permit. The City shall grant this type of permit only if the applicant demonstrates a number of hardships associated with building in a critical area

What if I own a parcel of land that is entirely within a critical area or buffer, does the CAO prohibit all reasonable use?

No. There is a provision in the CAO to apply for a Critical Area Reasonable Use Permit (CARUP) and if the very rigorous criteria are met, reasonable use of a property may be granted.

How do the amendments address wetland replacement ratios?

The amendments provide significant increases in wetland replacement and enhancement ratios. The increases to replacement ratios are supported by best available science.

### Proposed Replacement Ratios

Wetland Type	Wetland Creation Replacement Ratio (Area)	Wetland Enhancement Ratio (Area)
Type I	6:1	16:1
Type II	3:1	12:1
Type III	2:1	8:1
Type IV	1.5:1	6:1

### Existing Replacement Ratios

Wetland Creation Replacement Ratio (Area)	Wetland Enhancement Ratio (Area)
6:1	2:1
2:1	1:1
2:1	1:1
1.25:1	1:1

Do the amendments address the designation of Fish and Wildlife Habitat Conservation Areas (FWHCA)?

Yes. The amendments clarify that FWHCA are places formally designated by the City of Shoreline, based upon a review by BAS and input from the Washington Department of Fish and Wildlife, the Washington Department of Ecology and other agencies. It is the City's intention to produce a critical areas mapping folio that may include updates to the FWHCA. Additions of FWHCA to Shorelines maps are dependent on the Department of Fish and Wildlife accepting the proposed new mapping areas. It is anticipated that this mapping project will commence once the critical areas updates have been reviewed and adopted

Two areas of controversy have been "hazardous trees" and "salmonid fish use". Do the amendments address these contentious issues?

Yes. The amendments provide clarifications in the definitions of both "hazardous trees" and "salmonid fish use".

The proposed definition of Hazardous Trees:

**SMC 20.20.024 H.** Trees that have a structural defect, combination of defects or disease resulting in a structural defect that, under the normal range of environmental conditions at the site, will result in the loss of a major structural component of that tree in a manner that will:

1. Damage a residential structure or accessory structure, place of employment or public assembly or approved parking for a residential structure or accessory structure or place of employment or public assembly;
2. Damage an approved road or utility facility; or
3. Prevent emergency access in the case of medical hardship.

Removal of hazardous trees shall occur consistent with the tree conservation permitting and site restoration requirements of SMC 20.50.290 to 20.50.370.

Salmonid fish use is defined for where fish have been documented as well as where they are presumed based on passability or planned restoration. The proposed definition for salmonid fish use is:

**SMC20-80.470 D.** For the purposes of this section, "salmonid fish use" and "used by salmonid fish" is presumed for:

1. Streams where naturally reoccurring use by salmonid populations has been documented by a government agency;
2. Streams that are fish passable by salmonid populations from Lake Washington or Puget Sound, as determined by a qualified professional based on review of stream flow, gradient and barriers and criteria for fish passability established by the Washington Department of Fish and Wildlife; and

3. Streams that are planned for restoration in a 6-year capital improvement plan adopted by a government agency that will result in a fish passable connection to Lake Washington or Puget Sound.

The Department may waive the presumption of salmonid fish use for stream segments where a qualified professional has determined there are confirmed, long term water quality parameters making the stream segment incapable of supporting fish.

Views are important to me and add to my property values. In fact, my views are protected by private covenants. Yet trees have grown up in a critical area and they are now blocking my view. Do the amendments address this problem?

Yes. There are two new provisions in the amendments to address this issue. The first would allow for the removal of up to six significant trees in a critical area or buffer if “there is no net loss of the functions and values of each type of critical area”. In other words, you may be allowed to remove up to six significant trees within an critical area if it can be verified by a qualified professional that no harm will come to that critical area or its buffer. An example of this would be the removal of trees on a steep slope with the review and approval of a qualified geotechnical engineer. In most cases, replanting of vegetation will be required.

The second new provision would provide for the removal of a larger number of trees through a “View Preservation and Enhancement Program” if a “Critical Area Stewardship Plan” is reviewed and approved following a public process. A “Critical Area Stewardship Plan” shall be created by a licensed arborist as well as a qualified professional to assess the critical areas that lie within the limits of the proposed tree alteration. These professionals may include but are not limited to, a stream biologist, a wetland biologist, and a geotechnical engineer.

A lot of the streams and wetlands that once existed, before Shoreline was developed, were put into pipes. Do the amendments address how these streams in pipes could be “daylighted”.

Yes. A new provision encourages the restoration or piped and denigrated watercourses. The new section below is proposed to encourage watercourse restoration and to recognize that standard buffers discourage such restoration. It also establishes a review process for restoration to ensure that it doesn’t result in negative impacts.

**SMC20.80.490 H.** Restoring piped watercourses.

1. The city encourages the opening of previously channelized/culverted streams and the rehabilitation and restoration of streams.
2. When piped watercourse sections are restored, a protective buffer shall be required of the stream section. The buffer distance shall be based on an approved restoration plan, regardless of stream classification, and shall be a minimum of 10 feet to allow for restoration and maintenance. The stream and buffer area shall include habitat improvements and measures to prevent erosion,

landslide and water quality impacts. Opened channels shall be designed to support fish access, unless determine to be unfeasible by the City.

3. Removal of pipes conveying streams shall only occur when the City determines that the proposal will result in a net improvement of water quality and ecological functions and will not significantly increase the threat of erosion, flooding, slope stability or other hazards.

4. Where the buffer of the restored stream would extend beyond a required setback on an adjacent property, the applicant shall seek written agreement from the affected neighboring property owner.

How can I find the details of these amendments?

The amendments will be posted on the City of Shoreline website, [www.cityofshoreline.com](http://www.cityofshoreline.com) or may be obtained free of charge from the Department of Planning and Development Services, 17544 Midvale Ave. N, Shoreline, WA 98133

How can I comment on the proposed changes?

A Public Hearing is scheduled in front of the Shoreline Planning Commission on February 17, 2005.

Who can I contact is I have any questions?

Matt Torpey at (206)-546-3826, email [mtorpey@ci.shoreline.wa.us](mailto:mtorpey@ci.shoreline.wa.us)

# ATTACHMENT II

## Draft Revisions for Critical Areas Protection

### Chapter 20.20 Definitions

**Critical Areas** An area with one or more of the following environmental characteristics:

A. Geologic hazard areas, including but not limited to:

Steep slopes;

Landslide hazard areas;

Seismic hazard areas; and

Erosion hazard areas;

B. Flood plain hazard areas;

~~C. Soils classified as having high water tables;~~

~~D. Soils classified as highly erodible, subject to erosion, or highly acidic;~~

~~E. Seismic hazard areas;~~

~~F. Stream-corridor areas;~~

~~G. Estuaries;~~

~~H. Aquifer recharge areas;~~

The definition of critical areas is proposed to be updated to be consistent with GMA and the City's adopted code sections.



~~EI. Wetlands and wetland transition areas;  
and~~

~~FJ. Fish and wildlife Hhabitat conservation  
areass of endangered species.~~

(Ord. 352 § 1, 2004).

### **20.20.024 H definitions.**

**Hazardous  
Trees**

Trees that have a structural defect,  
combination of defects or disease  
resulting in a structural defect that,  
under the normal range of  
environmental conditions at the site,  
will result in the loss of a major  
structural component of that tree in a  
manner that will:

1. 4.–Damage a residential structure  
or accessory structure, place of  
employment or public assembly or  
approved parking for a residential  
structure or accessory structure or  
place of employment or public  
assembly;
2. Damage an approved road or utility  
facility; or
3. Prevent emergency access in the  
case of medical hardship.

Removal of hazardous trees shall  
occur consistent with the tree  
conservation permitting and site  
restoration requirements of SMC  
20.50.290 to 20.50.370.

### **20.20.044 R definitions.**

**Reasonable Use** The minimum use to which a property owner is entitled under applicable State and Federal constitutional provision, including takings and substantive due process. ~~Reasonable use shall be liberally construed to protect the constitutional rights of the applicant.~~ (Ord. 324 § 1, 2003).

Removing the last sentence will define Reasonable Use without inferring what level of direction the City should take. This is similar to definitions used by several Puget Sound jurisdictions. While not precisely defining the term “reasonable use” it infers that the concept is left to judicial decision and case law.

**20.20.046 S definitions.**

**Streams** Those areas in the City of Shoreline where open surface waters produce a defined channel or bed, not including irrigation ditches, canals, storm or surface water runoff devices or other entirely artificial open watercourses, unless they are used by salmonids or are used to convey streams naturally occurring prior to construction ~~in such watercourses.~~ A channel or bed need not contain water year-round, provided that there is evidence of at least intermittent flow during years of normal rain fall.

The last sentence is added to improve consistency with SMC 20.80.470 that includes intermittent streams in the classification of stream types. The sentence is derivative of language used by King County, Lake Forest Park and other jurisdictions.

*[All other definitions in Chapter 20.20 SMC would remain unchanged.]*

## **Chapter 20.80 Critical Areas**

Sections:

### **Subchapter 1. Critical Areas – General Provisions**

- 20.80.010 Purpose.
- 20.80.020 Critical areas maps.
- 20.80.025 Applicability.
- 20.80.030 Exemptions.
- 20.80.040 Partial exemptions.
- 20.80.045 Relationship to other regulations.
- 20.80.050 Notice to title.
- 20.80.060 Permanent field marking.
- 20.80.070 Alteration of critical areas.
- 20.80.080 Alteration or development of critical areas – Standards and criteria.
- 20.80.090 Buffer areas.
- 20.80.100 Classification and rating of critical areas.

### **Subchapter 2. Geologic Hazard Areas**

- 20.80.210 Description and purpose.
- 20.80.220 Classification.
- 20.80.230 Required buffer areas.
- 20.80.240 Alteration.
- 20.80.250 Mitigation performance standards and requirements.

### **Subchapter 3. Fish and Wildlife Habitat Conservation Areas**

- 20.80.260 Description and purpose.
- 20.80.270 Classification.
- 20.80.280 Required buffer areas.
- 20.80.290 Alteration.
- 20.80.300 Mitigation performance standards and requirements.

### **Subchapter 4. Wetlands**

- 20.80.310 Description and purpose.
- 20.80.320 Classification.
- 20.80.330 Required buffer areas.

- 20.80.340 Alteration.
- 20.80.350 Mitigation performance standards and requirements.

### **Subchapter 5. Flood Hazard Areas**

- 20.80.360 Description and purpose.
- 20.80.370 Classification.
- 20.80.380 Flood fringe – Development standards and permitted alterations.
- 20.80.390 Zero-rise floodway – Development standards and permitted alterations.
- 20.80.400 FEMA floodway – Development standards and permitted alterations.
- 20.80.410 Flood hazard areas – Certification by engineer or surveyor.

### **Subchapter 6. Aquifer Recharge Areas**

- 20.80.420 Description and purpose.
- 20.80.430 Classification.
- 20.80.440 Alteration.
- 20.80.450 Performance standards and requirements.

### **Subchapter 7. Stream Areas**

- 20.80.460 Description and purpose.
- 20.80.470 Classification.
- 20.80.480 Required buffer areas.
- 20.80.490 Alteration.
- 20.80.500 Mitigation performance standards and requirements.

#### **20.80.010 Purpose.**

- A. The purpose of this chapter is to establish supplemental standards for the protection of critical areas in compliance with the provisions of the Washington Growth Management Act of 1990 (Chapter 36.70A RCW) and consistent with the goals and policies of the Shoreline Comprehensive Plan in accordance with the procedures of Chapter 20.30 SMC.
  
- B. By identifying and regulating development and alterations to critical areas and their buffers, it is the intent of this chapter to:

1. Protect the public from injury, loss of life, property damage or financial losses due to flooding, erosion, landslide, seismic events, soils subsidence or steep slope failure;
2. Protect unique, fragile and valuable elements of the environment;
3. Reduce cumulative adverse environmental impacts to water quality, wetlands, streams and other aquatic resources, fish and wildlife habitat, steep slopes and geologically unstable features;
4. Meet the requirements of the National Flood Insurance Program and maintain the City of Shoreline as an eligible community for Federal flood insurance benefits;
5. Ensure the long-term protection of ground and surface water quality;
6. Alert members of the public, including appraisers, assessors, owners, potential buyers, or lessees, to the development limitations of critical areas and their required buffers;
7. Serve as a basis for exercise of the City's substantive authority under the State Environmental Policy Act (SEPA) and the City's Environmental Procedures (Chapter 20.30 SMC, Subchapter 8); and comply with the requirements of the Growth Management Act (Chapter 36.70A RCW) and its implementing rules;
8. Establish standards and procedures that are intended to protect environmentally critical areas while accommodating the rights of

property owners to use their property in a reasonable manner; and

9. Provide for the management of critical areas to maintain their functions and values and to restore degraded ecosystems. (Ord. 324 § 1, 2003; Ord. 238 Ch. VIII § 1(A), 2000).

**20.80.020 Critical areas maps.**

- A. The approximate location and extent of identified critical areas within the City's planning area are shown on the critical areas maps adopted as part of this chapter. These maps shall be used for informational purposes only to assist property owners and other interested parties. Boundaries and locations indicated on the maps are generalized. Critical areas and their buffers may occur within the City which have not previously been mapped.
- B. The actual presence or absence, type, extent, boundaries, and classification of critical areas shall be identified in the field by a qualified professional, and determined by the City, according to the procedures, definitions and criteria established by this chapter. In the event of any conflict between the critical area location or designation shown on the City's maps and the criteria or standards of this chapter, the criteria and standards shall prevail.
- C. The critical areas maps shall be periodically updated by the City and shall reflect any permit activity, results of special studies and reports reviewed and approved by the City, amendments to the Comprehensive Plan Environmental Element and Department identified errors and corrections. (Ord. 324 § 1, 2003; Ord. 238 Ch. VIII § 1(D), 2000. Formerly 20.80.040.).

**20.80.025 Applicability.**

- A. Unless explicitly exempted, the provisions of this chapter shall apply to all land uses and within all zoning designation in the City of Shoreline. All persons within the City shall comply with the requirements of this chapter.
  
- B. The City shall not approve any permit or otherwise issue any authorization to alter the condition of any land, water or vegetation or to construct or alter any structure or improvement without first assuring compliance with the requirements of this chapter.
  
- C. Approval of a development proposal pursuant to the provisions of this chapter does not discharge the obligation of the applicant to comply with the provisions of this chapter.
  
- D. ~~When any provisions of any other section of the City Code conflicts with this chapter or when the provisions of this chapter are in conflict, that provision which provides more protection to critical areas shall apply unless specifically provided otherwise in this chapter or unless such provision conflicts with Federal or State laws or regulations.~~
  
- E. The provisions of this chapter shall apply to any forest practices over which the City has jurisdiction pursuant to Chapter 76.09 RCW and WAC Title 222. (Ord. 324 § 1, 2003; Ord. 238 Ch. VIII § 1(E), 2000. Formerly 20.80.050.).

Subsection D is removed since it repeats SMC 20.80.045, which better addresses code conflicts.

**20.80.030 Exemptions.**

The following activities shall be exempt from the provisions of this chapter:

- A. Alterations in response to emergencies which threaten the public health, safety and welfare or which pose an imminent risk of damage to private property as long as any alteration undertaken pursuant to this subsection is reported to the City

as soon as possible. Only the minimum intervention necessary to reduce the risk to public health, safety, or welfare and/or the imminent risk of damage to private property shall be authorized by this exemption. The City shall confirm that an emergency exists and determine what, if any, additional applications and/or measures shall be required to protect the environment consistent with the provisions of this chapter, and to repair any damage to a preexisting resource;

- B. Public water, electric and natural gas distribution, public sewer collection, cable communications, telephone, utility and related activities undertaken pursuant to City-approved best management practices, and best available science with regard to protection of threatened and endangered species, as follows:
  - 1. Normal and routine maintenance or repair of existing utility structures or rights-of-way;
  - 2. Relocation of electric facilities, lines, equipment or appurtenances, not including substations, with an associated voltage of 55,000 volts or less, only when required by the City of Shoreline, which approves the new location of the facilities;
  - 3. Replacement, operation, repair, modification or installation or construction in an improved City road right-of-way or City authorized private roadway of all electric facilities, lines, equipment or appurtenances, not including substations, with an associated voltage of 55,000 volts or less;
  - 4. Relocation of public sewer local collection, public water local distribution, natural gas, cable communication or telephone facilities, lines, pipes, mains, equipment or appurtenances, only when required by the



City of Shoreline, which approves the new location of the facilities; and

5. Replacement, operation, repair, modification, relocations, installation or construction of public sewer local collection, public water local distribution, natural gas, cable communication or telephone facilities, lines, pipes, mains, equipment or appurtenances when such facilities are located within an improved public right-of-way or City authorized private roadway.
- C. Maintenance, operation, repair, modification or replacement of publicly improved roadways and associated stormwater drainage systems as long as any such alteration does not involve the expansion of roadways or related improvements into previously unimproved rights-of-way or portions of rights-of-way;
- D. Maintenance, operation or repair of publicly improved recreation areas as long as any such activity does not involve the expansion of uses and/or facilities into a previously unimproved portion of a preexisting area. Maintenance, operation and repair of publicly improved recreation areas within designated fish and wildlife habitat areas shall be permitted if all activities are performed consistent with the development standards of this chapter, best available science or adaptive management plans as recognized by the City;
- ~~E. Activities involving artificially created wetlands or streams intentionally created from nonwetland sites, including but not limited to grass-lined swales, irrigation and drainage ditches, detention facilities and landscape features, except wetlands, streams or swales created as mitigation or that provide or contribute to critical habitat for salmonid fishes;~~

It is unnecessary and redundant to exempt activities in artificial wetlands in this section. The definition of wetlands excludes specific types of artificial wetlands.

F. Activities affecting isolated Type IV wetlands which are individually smaller than 1,000 square feet and/or cumulatively smaller than 2,500 square feet in size where 80 percent or greater of the wetland area has been altered or is covered by invasives and the wetland has been determined to be of low hydraulic and habitat function;

Science supports preserving wetland functions, even when they are small. If an exemption is maintained for small wetlands it should be narrowed to only include those that are isolated and provide little function.

G. Activities occurring in areas which may be considered small steep slopes (areas of 40 percent slope or greater with a vertical elevation change of up to, but not greater than 20 feet), such as berms, retaining walls, excavations and small natural slopes, and activities on steep slopes created through prior legal grading activity may be exempted based upon City review of a soils report prepared by a qualified geologist or geotechnical engineer which demonstrates that no adverse impact will result from the exemption;

H. Minor conservation and enhancement of critical areas that does not alter the location, dimensions or size of the critical area or buffer, and results in improvement of the critical area functions.

A new exemption is proposed to encourage conservation and enhancement activities, such as the planting of native vegetation.

I. Removal of hazardous trees in accordance with SMC 20.50.310(A)(1)

A new exemption borrowed from King County critical areas regulations is proposed to facilitate removal of trees that pose a clear hazard to people and/or property.

J. View preservation and enhancement programs may be permitted in Critical Areas and their buffers if a Critical Area Stewardship Plan is approved as a Clearing Permit under SMC 20.50.290 and 20.50.300. The Critical Area Stewardship Plan must meet all of the following criteria:

The last portion of the subsection refers back to the tree conservation permitting requirements which may require the planting of replacement trees.

1. The Plan will result in no net loss of the functions and values of each critical area.
2. The Plan will maintain or enhance the natural hydrologic systems on the site.
3. The Plan will maintain, enhance or

Subsection J is added to allow limited tree trimming to provide view corridors, when conducted pursuant to the City's tree conservation requirements.

4. restore native vegetation on the site.  
The Plan will maintain habitat for fish and wildlife on the site and enhance the existing habitat.

The Plan may be phased. A performance bond or other acceptable security device to ensure the implementation of the plan may be required in an amount to be determined by the Director. The Director may require submittal of periodic monitoring reports as necessary to ensure that the criteria of the plan are being met. The contents of the monitoring report shall be determined by the Director, and may be subject to third party review, paid for by the applicant, at the Director's discretion.

- HK. Site investigative work and studies necessary for preparing land use applications, including soils tests, water quality studies, wildlife studies and similar tests and investigations; provided, that any disturbance of the critical area shall be the minimum necessary to carry out the work or studies;
- HL. Educational activities, scientific research, and outdoor recreational activities, including but not limited to interpretive field trips, bird watching, and use of existing trails for horseback riding, bicycling and hiking, that will not have an adverse effect on the critical area;
- JM. Normal and routine maintenance and operation of existing landscaping and gardens provided they comply with all other regulations in this chapter;
- KN. Minor activities not mentioned above and determined by the City to have minimal impacts to a critical area;

LO. Notwithstanding the exemptions provided by this section, any otherwise exempt activities occurring in or near a critical area should meet the purpose and intent of SMC 20.80.010 and should consider on-site alternatives that avoid or minimize impacts. (Ord. 324 § 1, 2003; Ord. 238 Ch. VIII § 1(G), 2000. Formerly 20.80.070.).

P. Up to six significant trees may be removed from a critical area or a critical area buffer if a Clearing Permit is approved under SMC 20.50.290 and 20.50.300 and includes sufficient mitigation so that there is no net loss of the functions and values of each type of critical area.

This would provide for removal of trees in a critical area of buffer when there is no net loss in the critical area function or values.

#### **20.80.040 Partial exemptions.**

A. The following are exempt from the provisions of this chapter except for the notice to title provisions and the flood hazard area provisions, if applicable.

1. Structural modification of, addition to, or replacement of structures, except single detached residences, in existence before November 27, 1990, which do not meet the building setback or buffer requirements for wetlands, streams or steep slope hazard areas if the modification, addition, replacement or related activity does not increase the existing building footprint of the structure lying within the above-described building setback area, sensitive area or buffer;
2. Structural modification of, addition to, or replacement of single detached residences in existence before November 27, 1990, which do not meet the building setback or buffer requirements for wetlands, streams or steep slope hazard areas if the modification, addition, replacement or related activity does not increase the existing footprint of the

residence lying within the above-described buffer or building setback area by more than 750 square feet over that existing before November 27, 1990, and no portion of the modification, addition or replacement is located closer to the critical area or, if the existing residence is within the critical area, extend farther into the critical area; and

3. Maintenance or repair of structures which do not meet the development standards of this chapter for landslide or seismic areas if the maintenance or repair does not increase the footprint of the structure and there is no increased risk to life or property as a result of the proposed maintenance or repair.
- B. A permit or approval sought as part of a development proposal for which multiple permits are required is exempt from the provisions of this chapter, except for the notice to title provisions, as applicable if:
1. The City of Shoreline has previously reviewed all critical areas on the site; and
  2. There is no material change in the development proposal since the prior review; and
  3. There is no new information available which may alter previous critical area review of the site or a particular critical area; and
  4. The permit or approval under which the prior review was conducted has not expired or, if no expiration date, no more than five years have lapsed since the issuance of that permit or approval; and

5. The prior permit or approval, including any conditions, has been complied with. (Ord. 324 § 1, 2003; Ord. 238 Ch. VIII § 1(H), 2000. Formerly 20.80.080.).

#### **20.80.045 Relationship to other regulations.**

- A. These critical area regulations shall apply as an overlay and in addition to zoning, land use and other regulations established by the City of Shoreline. In the event of any conflict between these regulations and any other regulations of the City, the regulations which provide greater protection to the environmentally critical areas shall apply.
- B. Areas characterized by particular critical areas may also be subject to other regulations established by this chapter due to the overlap or multiple functions of some critical areas. Wetlands, for example, may be defined and regulated according to the provisions for fish and wildlife habitat conservation areas contained in this chapter, as well as provisions regulating wetlands. In the event of any conflict between regulations for particular critical areas in this chapter, the regulations which provide greater protection to environmentally critical areas shall apply. (Ord. 324 § 1, 2003; Ord. 238 Ch. VIII § 1(K), 2000. Formerly 20.80.110.).

#### **20.80.050 Notice to title.**

- A. To inform subsequent purchasers of real property of the existence of critical areas, ~~When~~ development is permitted in an identified critical area ~~which is comprised of a regulated critical area and~~ its associated buffer, a notice to title applicable to the property shall be filed with the King County Department of Records. The notice shall state that critical areas or buffers have been identified on the property and the fact that limitations on actions in or affecting the critical area or buffer may exist. The notice shall run with the land. This notice shall not be required

In the notice on title provisions, the distinction between subsections A and B appears to create confusion. They both seem to be requiring the designation of critical areas tracts, although B limits it to just subdivisions and binding site plans and A appears to require tracts for all development. More common with other jurisdictions, is to require a notice on title (relatively simple) for all development, and the recording of tracts on where plat drawings are being recorded. These two sections are proposed to be revised in that manner.

for development by a public agency or public or private utility when:

1. Within a recorded easement or right-of-way;  
or
2. On the site of a permanent public facility.

~~the area shall be placed either in a separate tract on which development is prohibited, protected by execution of an easement, dedicated to a conservation organization or land trust, or similarly preserved through a permanent protective mechanism acceptable to the City. The location and limitations associated with the critical area shall be shown on the face of the deed or plat applicable to the property and shall be recorded with the King County Department of Records.~~

- B. Subdivisions, short subdivisions, development agreements, and binding site plans which include critical areas or their buffers shall establish a separate tract (a critical areas tract) as a permanent protective measure for wetlands, streams, fish and wildlife habitat, landslide hazard areas and their buffers. The plat or binding site plan for the project shall clearly depict the critical areas tract, and shall include all of the subject critical area and any required buffer, as well as additional lands, as determined by the developer. Restrictions to development within the critical area tract shall be clearly noted on the plat or plan. Restrictions shall be consistent with this chapter for the entire critical area tract, including any additional areas included voluntarily by the Developer. Should the critical area tract include several types of critical areas the developer may wish to establish separate critical areas tracts. (Ord. 324 § 1, 2003; Ord. 238 Ch. VIII § 1(M), 2000. Formerly 20.80.130.).

### **20.80.060 Permanent field marking.**

- A. All critical areas tracts, easements or dedications shall be clearly marked on the site using permanent markings, placed every 300 feet which include the following text:

***This area has been identified as a <<INSERT TYPE OF CRITICAL AREA>> by the City of Shoreline. Activities, including clearing and grading, removal of vegetation, pruning, cutting of trees or shrubs, planting of nonnative species, and other alterations may be prohibited. Please contact the City of Shoreline Department of Development (206) 546-1811 for further information.***

- B. It is the responsibility of the landowner to maintain and replace if necessary all permanent field markings. (Ord. 324 § 1, 2003; Ord. 238 Ch. VIII § 1(N), 2000. Formerly 20.80.140.).

### **20.80.070 Alteration of critical areas.**

Alteration of critical areas, including their established buffers, may only be permitted subject to the criteria in this chapter, and compliance with any Federal and/or State permits required. (Ord. 324 § 1, 2003; Ord. 238 Ch. VIII § 2(A), 2000. Formerly 20.80.160.).

### **20.80.080 Alteration or development of critical areas – Standards and criteria.**

~~All impacts to critical areas functions and values shall be mitigated. This section applies to mitigation required with all critical areas reviews, approvals and enforcement pursuant to this Chapter. This section is supplemented with specific measures under subchapters for particular critical areas. The proponent for a project involving critical areas shall seek to avoid, minimize and mitigate the impacts to the critical areas through Mitigation actions by an applicant or property owner shall~~ that occur in the following sequence:

SMC 20.80.080 is revised to make it clear that this sets up a mitigation framework and that mitigation and protection measures are specified in the subchapters for individual critical areas. "Enforcement" is added to bring in the same considerations when we abate or mitigate a violation.



- A. Avoiding the impact altogether by not taking a certain action or parts of actions;
- B. Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- C. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- D. Reducing or eliminating the impact over time through preservation and maintenance operations during the life of the action; and/or
- E. Compensating for the impact by replacing or providing substitute resources or environments. (Ord. 324 § 1, 2003; Ord. 238 Ch. VIII § 2(B), 2000. Formerly 20.80.170.).

**20.80.090 Buffer areas.**

The establishment of buffer areas shall be required for all development proposals and activities in or adjacent to critical areas. The purpose of the buffer shall be to protect the integrity, function, value and resource of the subject critical area, and/or to protect life, property and resources from risks associated with development on unstable or critical lands. Buffers shall consist of an undisturbed area of native vegetation established to achieve the purpose of the buffer. If the buffer area has previously been disturbed, it shall be revegetated pursuant to an approved planting plan. Buffers shall be protected during construction by placement of a temporary barricade if determined necessary by the City, on-site notice for construction crews of the presence of the critical area, and implementation of appropriate erosion and sedimentation controls. Restrictive covenants or conservation easements may be required to preserve and protect buffer areas. (Ord. 324 § 1, 2003; Ord. 238 Ch. VIII § 2(C), 2000. Formerly 20.80.180.).

**20.80.100 Classification and rating of critical areas.**

To promote consistent application of the standards and requirements of this chapter, critical areas within the City of Shoreline shall be rated or classified according to their characteristics, function and value, and/or their sensitivity to disturbance. Classification of critical areas shall be determined by the City using the following tools:

- A. Application of the criteria contained in these regulations;
- B. Consideration of the technical reports submitted by qualified professionals in connection with applications subject to these regulations; and
- C. Review of maps adopted pursuant to this chapter. (Ord. 324 § 1, 2003; Ord. 238 Ch. VIII § 2(E), 2000. Formerly 20.80.200.).

**Subchapter 2. Geologic Hazard Areas**

**20.80.210 ~~Description~~ Designation and purpose.**

- A. Geologic hazard areas ~~include~~ are those lands that are affected by natural processes that make them susceptible to geologic events, such as landslides, seismic activity and severe erosion, especially bluff and ravine areas and steep slopes. Areas suseptible to one or more of the following types of hazards shall be designated as geologically hazardous areas:

- 1. Erosion hazard;
- 2. Landslide hazard;

The changes to SMC 20.80.210 are to explicitly designate those geologic hazard areas.

3. Seismic hazard:

- B. The primary purpose of geologic hazard area regulations is to avoid and minimize potential impacts to life and property from geologic hazards, conserve soil resources, and minimize structural damage relating to seismic hazards. This purpose shall be accomplished through appropriate levels of study and analysis, application of sound engineering principles, and regulation or limitation of land uses, including maintenance of existing native vegetation, regulation of clearing and grading activities, and control of stormwater. (Ord. 238 Ch. VIII § 3(A), 2000).

**20.80.220 Classification.**

Geologic hazard areas shall be classified according to the criteria in this section as follows:

- A. **Landslide Hazard Areas.** Landslide hazard areas are classified as ~~“Class I”, “Class II”, “Class III” or “Class IV”~~ as follows:

- ~~1.~~ ~~Class I/Low Hazard: Areas with slopes of less than 15 percent.~~
- ~~21.~~ ~~Class II/Moderate Hazard: Areas with slopes between 15 percent and 40 percent and that are underlain by soils that consist largely of sand, gravel or glacial till.~~
- ~~32.~~ ~~Class III/High Hazard: Areas with slopes between 15 percent and 40 percent that are underlain by soils consisting largely of silt and clay.~~

Low (class I) hazards – all areas in the City that are essentially flat – are removed to clarify that they are not regulated under this chapter.

43. ~~Class IV~~ Very High Hazard: Areas with slopes steeper than 15 percent with zones of emergent water (e.g., springs or ground water seepage), areas of landslide deposits regardless of slope, and all steep slope hazard areas sloping 40 percent or steeper.

**B. Seismic Hazard Areas.** Seismic hazard areas are lands that, due to a combination of soil and ground water conditions, are subject to severe risk of ground shaking, subsidence or liquefaction of soils during earthquakes. These areas are typically underlain by soft or loose saturated soils (such as alluvium) and have a shallow ground water table.

**C. Erosion and Sedimentation Hazards.** Erosion hazard areas are lands or areas underlain by soils identified by the U.S. Department of Agriculture Natural Resources Conservation Service (formerly the Soil Conservation Service) as having “severe” or “very severe” erosion hazards. This includes, but is not limited to, the following group of soils when they occur on slopes of 15 percent or greater: Alderwood-Kitsap (AkF), Alderwood gravely sandy loam (AgD), Kitsap silt loam (KpD), Everett (EvD) and Indianola (InD).

~~D. Steep Slopes. Steep slopes are those areas sloping 40 percent or steeper.~~

Steep slopes are included as Very High Landslide Hazards so it is unnecessary to repeat them here.

(Ord. 238 Ch. VIII § 3(B), 2000).

**20.80.230 Required buffer areas.**

A. Required buffer widths for geologic hazard areas shall reflect the sensitivity of the hazard area and the risks associated with development and, in those circumstances permitted by these regulations, the type and intensity of human activity and site design proposed to be conducted on or near the area. ~~Buffers or setbacks shall be~~

Buffer requirements are spelled out in subsection C, below.

~~measured from the top and toe of the slope and along the sides of the slope.~~

B. In determining the appropriate buffer width, the City shall consider the recommendations contained in ~~any technical~~ a geotechnical report required by these regulations and prepared by a qualified consultant.

C. For landslide hazard areas, the standard buffer shall be 50 feet from all edges of the landslide hazard area. Larger buffers may be required as needed to eliminate or minimize the risk to people and property based on a geotechnical report prepared by a qualified professional.

~~C~~D. Landslide hazard area B buffers may be reduced to a minimum of 15 feet when technical studies conclusively demonstrate that the reduction will adequately protect people and the proposed and surrounding development from the ~~critical~~ landslide hazard.

~~D~~E. ~~Critical~~—Landslide hazard areas and their associated buffers shall be placed either in a separate tract on which development is prohibited, protected by execution of an easement, dedicated to a conservation organization or land trust, or similarly preserved through a permanent protective mechanism acceptable to the City. The location and limitations associated with the critical landslide hazard and its buffer shall be shown on the face of the deed or plat applicable to the property and shall be recorded with the King County Department of Records and Elections. (Ord. 238 Ch. VIII § 3(C), 2000).

Subsection C is proposed to provide a specific buffer distance for landslide hazards. Review of science indicates that landslide hazards should be avoided or mitigated through engineering. While science does not provide a specific buffer distance, a 50-foot buffer is commonly required by other jurisdictions as a standard to prevent impacts in most situations. The regulations are also changed to apply the buffer to the sides of the hazard, in addition to top and toe of slope, to acknowledge that all areas adjacent to hazards are at risk.

#### **20.80.240 Alteration.**

A. The City shall approve, condition or deny proposals in a geologic hazard area as appropriate based upon the effective mitigation of

risks posed to property, health and safety. The objective of mitigation measures shall be to render a site containing a geologic hazard as safe as one not containing such hazard. Conditions may include limitations of proposed uses, modification of density, alteration of site layout and other appropriate changes to the proposal. Where potential impacts cannot be effectively mitigated, ~~or where the~~ to eliminate a significant risk to public health, safety and welfare, public or private property, or important natural resources is significant notwithstanding mitigation, the proposal shall be denied.

B. ~~Class IV~~ **Very High Landslide Hazard Areas.** Development shall be prohibited in ~~Class IV~~ (very high) landslide hazards areas or their buffers except as granted by a critical areas special use permit or a critical areas reasonable use permit.

The class numbering provides little value. Therefore it is proposed to use the descriptive names – “Very High” and “Moderate and High” for the hazard areas.

C. ~~Class II, III, IV~~ **Moderate and High Landslide Hazards.** Alterations proposed to ~~Class II, III, and IV~~ moderate and high Landslide Hazards or their buffers shall be evaluated by a qualified professional through the preparation of the geotechnical report. However, for proposals that include no development, construction, or impervious surfaces, the City, in its sole discretion, may waive the requirement for a geotechnical report. The recommendations contained within the geotechnical report shall be incorporated into the alteration of the landslide hazard area or their buffers.

The geotechnical engineer and/or geologist preparing the report shall provide assurances that the risk of damage from the proposal, both on-site and off-site, are minimal subject to the conditions set forth in the report, that the proposal will not increase the risk of occurrence of the potential landslide hazard, and that measures to eliminate or reduce risks have been incorporated into the report’s recommendations.

Requirements of the geotechnical report in subsection F have been incorporated into the landslide hazard section.

#### D. **Critical Seismic Hazard Areas.**

1. For one-story and two-story residential structures, a qualified professional shall conduct an evaluation of site response and liquefaction potential based on the performance of similar structures with similar foundation conditions; or
2. For all other proposals, the applicant shall conduct an evaluation of site response and liquefaction potential including sufficient subsurface exploration to determine the site coefficient for use in the static lateral force procedure described in the Uniform Building Code.

The code regulates all seismic hazard areas, so the qualifier "critical" is unnecessary.

#### E. **Erosion Hazard Areas.**

1. Up to 1,500 square feet may be cleared on any lot in an erosion hazard area without a permit, unless the site also contains another type of critical area or any other threshold contained in SMC 20.50.320 would be exceeded.
2. All development proposals on sites containing erosion hazard areas shall include a temporary erosion and sediment control plan consistent with the requirements of the adopted surface water design manual and a revegetation plan to ensure permanent stabilization of the site. Specific requirements for revegetation plans shall be determined on a case-by-case basis during permit review and administrative guidelines shall be developed by the Department. Critical area revegetation plans may be combined with required landscape, tree retention, and/or other critical area mitigation plans as appropriate.

3. All subdivisions, short subdivisions or binding site plans on sites with erosion hazard areas shall comply with the following additional requirements:
  - a. Except as provided in this section, existing vegetation shall be retained on all lots until building permits are approved for development on individual lots;
  - b. If any vegetation on the lots is damaged or removed during construction of the subdivision infrastructure, the applicant shall be required to implement the revegetation plan in those areas that have been impacted prior to final inspection of the site development permit or the issuance of any building permit for the subject property;
  - c. Clearing of vegetation on individual lots may be allowed prior to building permit approval if the City of Shoreline determines that:
    - i. Such clearing is a necessary part of a large scale grading plan,
    - ii. It is not feasible to perform such grading on an individual lot basis, and
    - iii. Drainage from the graded area will meet water quality standards to be established by administrative rules.
4. Where the City of Shoreline determines that erosion from a development site poses a significant risk of damage to downstream receiving water, the applicant shall be required to provide regular monitoring of surface water discharge from the site. If the project does not meet water quality



standards established by law or administrative rules, the City may suspend further development work on the site until such standards are met.

5. The City may require additional mitigation measures in erosion hazard areas, including, but not limited to, the restriction of major soil disturbing activities associated with site development between October 15th and April 15th to meet the stated purpose contained in SMC 20.80.010 and SMC 20.80.210.
6. The use of hazardous substances, pesticides and fertilizers in erosion hazard areas may be prohibited by the City of Shoreline.

~~F. When development is permitted in geologic hazard areas by these regulations, an applicant and/or its qualified consultant shall provide assurances which include the following:~~

- ~~1. A report from the geotechnical engineer and/or geologist who prepared the studies required by these regulations that the risk of damage from the proposal, both on-site and off-site, are minimal subject to the conditions set forth in the report, that the proposal will not increase the risk of occurrence of the potential geologic hazard, and that measures to eliminate or reduce risks have been incorporated into the report's recommendations; and~~
- ~~2. A legal statement which shall be recorded and noted on the face of the deed or plat, executed in a form satisfactory to the City, that characterizes the site as being located within a geologic hazard area, and states that there may or may not be risks associated with the development of the site.~~

Subsection 1 is proposed to be combined with subsection C for landslide hazard areas, above.

Subsection 2 is covered by the notice to title provisions of SMC 20.80.050.

Subsection 3 is added to the mitigation standards listed below in SMC 20.80.250.

~~In addition the provisions for permanent field marking (SMC 20.80.140) may apply; and~~

- ~~3. Posting of a bond, guarantee or other assurance device approved by the City to cover the cost of monitoring, maintenance and any necessary corrective actions. (Ord. 352 § 1, 2004; Ord. 324 § 1, 2003; Ord. 299 § 1, 2002; Ord. 238 Ch. VIII § 3(D), 2000).~~

### **20.80.250 Mitigation performance standards and requirements.**

The following performance standards shall apply to any mitigations for development proposed within geologic hazard areas located within the City:

- A. Relevant performance standards from SMC 20.80.080, 20.80.300, 20.80.350 and 20.80.500 as determined by the City, shall be incorporated into mitigation plans.
- B. The following additional performance standards shall be reflected in proposals within geologic hazard areas:
  1. Geotechnical studies shall be prepared by a qualified consultant to identify and evaluate potential hazards and to formulate mitigation measures.
  2. Construction methods will reduce or not adversely affect geologic hazards.
  3. Site planning should minimize disruption of existing topography and natural vegetation.
  4. Impervious surface coverage should be minimized.

5. Disturbed areas should be replanted as soon as feasible pursuant to an approved landscape plan.
6. Clearing and grading regulations as set forth by the City shall be followed.
7. The use of retaining walls that allow maintenance of existing natural slope areas are preferred over graded slopes.
8. Temporary erosion and sedimentation controls, pursuant to an approved plan, shall be implemented during construction.
9. Undevelopable geologic hazard areas larger than one-half acre shall be placed in a separate tract, provided this requirement does not make the lot nonconforming.
10. A monitoring program shall be prepared for construction activities permitted in geologic hazard areas.
11. A bond, guarantee or other assurance device approved by the City shall be posted to cover the cost of monitoring, maintenance and any necessary corrective actions.
- ~~44~~12. Development shall not increase instability or create a hazard to the site or adjacent properties, or result in a significant increase in sedimentation or erosion. (Ord. 238 Ch. VIII § 3(E), 2000).

Borrowed from subsection F in SMC 20.80.240, above.

### **Subchapter 3. Fish and Wildlife Habitat Conservation Areas**

**20.80.260 ~~Description~~ Designation and purpose.**

A. Fish and wildlife habitat conservation areas include nesting and breeding grounds for State and Federal threatened, endangered, critical or priority species as ~~identified~~listed by the Washington State Department of Fish and Wildlife, including corridors which connect priority habitat, and those areas which provide habitat for species of local significance which have been or may be identified in the City of Shoreline Comprehensive Plan.

“Critical” added to be consistent with SMC 20.80.270. “Listed” added to clarify that it applies to species formally listed by the agencies.

B. The purpose of fish and wildlife habitat conservation areas shall be to provide opportunities for food, cover, nesting, breeding and movement for fish and wildlife within the City; maintain and promote diversity of species and habitat within the City; coordinate habitat protection with elements of the City’s established open space corridors wherever possible; help to maintain air and water quality; control erosion; provide areas for recreation, education and scientific study and aesthetic appreciation; and contribute to the established character of the City.

C. The City of Shoreline has given special consideration to the identification and regulation of fish and wildlife habitat conservation areas that support anadromous fisheries in order to preserve and enhance species which are or may be listed as endangered, threatened or priority species by State and Federal agencies. (Ord. 238 Ch. VIII § 4(A), 2000).

**20.80.270 Classification.**

Fish and wildlife habitat areas are those areas designated by the City based ~~that meet on~~ any of the following criteria, review of the best available science, and input from Washington Department of Fish and Wildlife, Washington Department of Ecology and other agencies:

The classification of habitat areas is proposed to be revised to make it clear that these are areas the City designates and to include best available science and the state agencies in the designation process.

- A. The ~~documented~~ presence of species proposed or listed by the Federal government or State of Washington as endangered, threatened, critical, or priority documented by best available science; or
- B. The presence of heron rookeries or priority raptor nesting trees; or
- C. Type I wetlands, as defined in these regulations; or
- D. Type I streams, as defined in these regulations; or
- E. Those areas which include the presence of locally significant species, if the City has designated such species. (Ord. 238 Ch. VIII § 4(B), 2000).

**20.80.280 Required buffer areas.**

- A. Buffer widths for fish and wildlife habitat areas shall be based on consideration of the following factors: species specific recommendations of the Washington State Department of Wildlife; recommendations contained in a habitat management plan submitted by a qualified consultant; and the nature and intensity of land uses and activities occurring on the and adjacent to the site.
- B. Low impact uses and activities which are consistent with the purpose and function of the habitat buffer and do not detract from its integrity may be permitted within the buffer depending on the sensitivity of the habitat area. Examples of uses and activities which may be permitted in appropriate cases include trails that are pervious, viewing platforms, stormwater management facilities such as grass-lined swales, utility easements and other similar uses and activities; provided, that any impacts to the buffer resulting from such permitted facilities shall be fully mitigated.

- C. Fish and wildlife habitat conservation areas and their associated buffers shall be placed either in a separate tract on which development is prohibited, protected by execution of an easement, dedicated to a conservation organization or land trust, or similarly preserved through a permanent protective mechanism acceptable to the City. The location and limitations associated with the critical habitat and its buffer shall be shown on the face of the deed or plat applicable to the property and shall be recorded with the King County Department of Records and Elections. (Ord. 238 Ch. VIII § 4(C), 2000).

**20.80.290 Alteration.**

- A. Alterations of fish and wildlife habitat conservation areas shall be avoided, subject to the reasonable use provision section (SMC 20.30.336) or special use permit section (SMC 20.30.333).
- B. Any proposed alterations permitted, consistent with special use or reasonable use review, to fish and wildlife habitat conservation area shall require the preparation of a habitat management plan, consistent with the requirements of the Washington State Department of Fish and Wildlife Priority Habitat Program. The habitat management plan shall be prepared by a qualified consultant and reviewed and approved by the City. (Ord. 238 Ch. VIII § 4(D), 2000).

**20.80.300 Mitigation performance standards and requirements.**

- A. Relevant performance standards for other critical areas (such as wetlands and streams) that may be located within the fish and wildlife habitat conservation area, as determined by the City, shall be incorporated into mitigation plans.
- B. The following additional mitigation measures shall be reflected in fish and wildlife habitat conservation area mitigation planning:

1. The maintenance and protection of habitat values shall be considered a priority in site planning and design.
2. Buildings and structures shall be located in a manner that preserves and minimizes adverse impacts to important habitat areas. This may include clustering buildings and locating fences outside of habitat areas.
3. Retained habitat shall be integrated into open space and landscaping.
4. Where possible, habitat and vegetated open space shall be consolidated in contiguous blocks.
5. Habitat shall be located contiguous to other habitat areas, open space or landscaped areas both on and off site to contribute to a continuous system or corridor that provides connections to adjacent habitat areas.
6. Native species shall be used in any landscaping of disturbed or undeveloped areas and in any enhancement of habitat or buffers.
7. The heterogeneity and structural diversity of vegetation shall be emphasized in landscaping.
8. Significant trees, preferably in groups, shall be preserved, consistent with the requirements of Chapter 20.50 SMC, Subchapter 5, Tree Conservation, Land Clearing and Site Grading, and with the objectives found in these standards. (Ord. 238 Ch. VIII § 4(E), 2000).

## Subchapter 4. Wetlands

### 20.80.310 ~~Description~~ Designation and purpose.

- A. Wetlands are 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 typically adapted for life in saturated soil conditions, as defined by the Washington State Wetlands Identification and Delineation Manual (Department of Ecology Publication #96-94). Wetlands generally include swamps, marshes, bogs, and similar areas.

Wetlands do not include those artificial wetlands intentionally created from nonwetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from nonwetland areas to mitigate the conversion of wetlands.

- B. Wetlands help to maintain water quality; store and convey stormwater and floodwater; recharge ground water; provide important fish and wildlife habitat; and serve as areas for recreation, education, scientific study and aesthetic appreciation.

- BC. The City's overall goal shall be to achieve no net loss of wetlands. This goal shall be implemented through retention of the function, value and acreage of wetlands within the City. Wetland buffers serve to moderate runoff volume and flow rates; reduce sediment, chemical nutrient and toxic pollutants; provide shading to maintain desirable water temperatures; provide habitat for wildlife; protect wetland resources from harmful

The definition of wetlands is added to make it clear what areas are regulated by the following code sections. The definition is consistent with the GMA (RCW 36.70A.030(20)) definition of wetlands and eliminates the need for subsection E under Classification that attempts to address artificially created wetlands.



intrusion; and generally preserve the ecological integrity of the wetland area.

GD. The primary purpose of the wetland regulations is to avoid detrimental wetland impacts and achieve a goal of no net loss of wetland function, value and acreage; and where possible enhance and restore wetlands. (Ord. 238 Ch. VIII § 5(A), 2000).

### **20.80.320 Classification.**

Wetlands, as defined by this section, shall be ~~designated Type I, Type II, Type III, Type IV and artificial~~ classified according to the following criteria:

A. "Type I wetlands" are those wetlands which meet any of the following criteria:

1. The presence of species proposed or listed by the Federal government or State of Washington as endangered, threatened, critical or ~~monitored~~ priority, or the presence of critical or outstanding actual or potential habitat for those species; or
2. Wetlands having 40 percent to 60 percent open water in dispersed patches with two or more wetland subclasses of vegetation; or
3. High quality examples of a native wetland listed in the terrestrial and/or aquatic ecosystem elements of the Washington Natural Heritage Plan that are presently identified as such or are determined to be of Heritage quality by the Department of Natural Resources; or
4. The presence of plant associations of infrequent occurrence. These include, but are not limited to, plant associations found in bogs and in wetlands with a coniferous

Revised to be consistent with SMC 20.80.260.

forested wetland class or subclass occurring on organic soils.

B. "Type II wetlands" are those wetlands which are not Type I wetlands and meet any of the following criteria:

1. Wetlands greater than one acre (43,560 sq. ft.) in size;
2. Wetlands equal to or less than one acre (43,560 sq. ft.) but greater than one-half acre (21,780 sq.ft.) in size and have three or more wetland classes; or
3. Wetlands equal to or less than one acre (43,560 sq. ft.) but greater than one-half acre (21,780 sq.ft.) in size, and have a forested wetland class or subclasses.

C. "Type III wetlands" are those wetlands that are equal to or less than one acre in size and that have one or two wetland classes and are not rated as Type IV wetlands, or wetlands less than one-half acre in size having either three wetlands classes or a forested wetland class or subclass.

D. "Type IV wetlands" are those wetlands that are equal to or less than 2,500 square feet, hydrologically isolated and have only one, unforested, wetland class.

~~E. "Artificially created wetlands" are those landscape features, ponds and stormwater detention facilities purposefully or accidentally created. Artificially created wetlands do not include wetlands created as mitigation or wetlands modified for approved land use activities. Purposeful or accidental creation must be demonstrated to the City through documentation, photographs, statements or other evidence.~~

Artificially created wetlands are addressed by the definition of wetlands under GMA and as stated above.

Artificial wetlands intentionally created from nonwetland sites for the purposes of wetland mitigation are regulated under this subchapter. (Ord. 238 Ch. VIII § 5(B), 2000).

**20.80.330 Required buffer areas.**

A. Required wetland buffer widths shall reflect the sensitivity of the area and resource or the risks associated with development and, in those circumstances permitted by these regulations, the type and intensity of human activity and site design proposed to be conducted on or near the critical area. Wetland buffers shall be measured from the wetland edge as delineated and marked in the field using the 1987 Department of Ecology Wetland Manual or adopted successor.

B. Wetland buffers shall be established as follows:

**Table 20.80.330B**

Wetland Type	Maximum Standard Buffer Width (ft)	Minimum Buffer Width (ft)
Type I	150	<del>400</del> 115
Type II	<del>400</del> 115	<del>50</del> 75
Type III	<del>50</del> 65	<del>25</del> 35
Type IV	<del>40</del> 35	<del>40</del> 25

DC. The maximum standard buffer width shall be established, provided that the buffer may be reduced to the minimum buffer listed above if unless the applicant can demonstrate that a smaller area is adequate to protect the wetland functions and -one or both of the following:

Review of science indicates that larger buffers tend to provide greater protection and that very small buffers provide only minimal protective function. Therefore it is proposed to increase several of the buffers and to align them with the buffers for streams to increase consistency. Buffer distances are based in part on the WRIA 8 recommendations.

The following language is revised for clarity and to state that a reduced buffer must protect the wetland functions.

1. The proposed use and/or activities are considered low impact, and may include the following:
  - a. A site layout with no parking, outdoor storage, or use of machinery;
  - b. The proposed use does not involve usage or storage of chemicals; and/or
  - c. Passive areas are located adjacent to the subject buffer; and/or
  - d. Both the wetland and its buffer are incorporated into the site design in a manner which eliminates the risk of adverse impact on the subject critical area.

2. Wetland and buffer enhancement is implemented that will result in equal or greater wetland functions. This includes but is not limited to the following:

- a. Enhancement of fish and wildlife habitat by incorporating structures that are likely to be used by wildlife, including wood duck houses, bat boxes, nesting platforms, snags, rootwads/stumps, birdhouses, and heron nesting areas.
- b. Planting native vegetation that would increase value for fish and wildlife habitat, improve water quality, or provide aesthetic/recreational value.

D. When a wetland has salmonid fish use consistent with SMC 20.80.470, the corresponding wetland or stream buffer, whichever is greater, shall be established.

This revision is to state that mitigation must not only be provided, but must at least maintain the wetland functions to ensure that mitigation fully offsets impacts.

Subsection D is proposed to ensure that a buffer protects fish habitat when such habitat is part of a wetland.

~~GE.~~ Applicants may choose to establish additional protections beyond the maximum. The City may extend the width of the buffer on the basis of site-specific analysis when necessary to achieve the goals of this subchapter.

The applicant's choice to expand protection is a given and not a regulation.

~~EF.~~ Wetland buffer widths may be modified by averaging buffer widths as set forth herein. Buffer width averaging shall be allowed only where the applicant demonstrates to the City:

~~that the wetland contains variations in sensitivity due to existing physical characteristics; that lower intensity land uses would be located adjacent to areas where buffer width is reduced;~~

The subsection on wetland buffer averaging is outlined to make it easier to follow the specific criteria. The criteria are revised to be more in line with the code adopted by King County following best available science review. The "sensitivity" statement is rephrased at the end of the subsection to make it clearer how sensitivity relates to buffer averaging.

~~1. that width averaging will not adversely impact the wetland functional values~~The ecological structure and function of the buffer after averaging is equivalent to or greater than the structure and function before averaging;

~~2. and that~~ That the total area contained within the buffer after averaging is no less than that contained within the standard buffer prior to averaging.

~~3. Buffer averaging shall~~will not result in a buffer width being reduced by more than 25 percent of the required buffer as set forth in Table 20.80.330B and in no case may the buffer be less than 40 feet ~~in~~than the stated minimum width.

The City may require buffer averaging to be designed to protect areas of greater sensitivity and function based on the recommendations of a wetland report prepared by a qualified professional.

- F. Low impact uses and activities which are consistent with the purpose and function of the wetland buffer and do not detract from its integrity may be permitted within the buffer depending on the sensitivity of the wetland. Examples of uses and activities which may be permitted in appropriate cases include trails constructed in a manner to reduce impervious surfaces, viewing platforms, and utility easements; provided, that any impacts to the buffer resulting from such permitted activities is fully mitigated. Uses permitted within the buffer shall be located as far from the wetland as possible.
  
- G. Stormwater management facilities, such as grass lined swales, may not be located within the minimum buffer area as set forth in Table 20.80.330B unless it is determined that the location of the facility will enhance the buffer area, and protect the wetland.
  
- H. A regulated wetland and its associated buffer shall either be placed in a separate tract on which development is prohibited, protected by execution of an easement, dedicated to a conservation organization or land trust, or similarly preserved through a permanent protective mechanism acceptable to the City. The location and limitations associated with the wetland and its buffer shall be shown on the face of the deed or plat applicable to the property and shall be recorded with the King County Department of Records. (Ord. 238 Ch. VIII § 5(C), 2000).

**20.80.340 Alteration.**

A. **Type I Wetlands.** Alterations of Type I wetlands shall be prohibited subject to the reasonable use provisions and special use permit provision of this title.

B. **Type II, III and IV Wetlands.**

1. Any proposed alteration and mitigation shall comply with the mitigation performance standards and requirements of these regulations; and
2. No net loss of wetland function and value may occur; and
3. Where enhancement or replacement is proposed, ratios shall comply with the requirements of this subchapter. (Ord. 238 Ch. VIII § 5(D), 2000).

**20.80.350 Mitigation performance standards and requirements.**

- A. Appropriate Wetland Mitigation Sequence and Actions.** Where impacts cannot be avoided, and the applicant has exhausted feasible design alternatives, the applicant or property owner shall seek to implement other appropriate mitigation actions in compliance with the intent, standards and criteria of this section. In an individual case, these actions may include consideration of alternative site plans and layouts, reductions in the density or scope of the proposal, and/or implementation of the performance standards listed in this subchapter.
- B. Impacts to wetland functions and values shall be mitigated.** Mitigation actions shall be implemented in the preferred sequence: Avoidance, minimization, restoration and replacement. Proposals which include less preferred and/or compensatory mitigation shall demonstrate that:
1. All feasible and reasonable measures will be taken to reduce impacts and losses to the critical area, or to avoid impacts where avoidance is required by these regulations; and

2. The restored, created or enhanced critical area or buffer will be as available and persistent as the critical area or buffer area it replaces; and
3. In the case of wetlands and streams, no overall net loss will occur in wetland or stream functions and values.

**C. Location and Timing of Wetland Mitigation.**

1. Wetland mitigation shall be provided on-site, unless on-site mitigation is not scientifically feasible due to the physical features of the property. The burden of proof shall be on the applicant to demonstrate that mitigation cannot be provided on-site.
2. When mitigation cannot be provided on-site, mitigation shall be provided in the immediate vicinity of the permitted activity on property owned or controlled by the applicant such as an easement, provided such mitigation is beneficial to the critical area and associated resources. It is the responsibility of the applicant to obtain title to off-site mitigation areas.
3. In-kind mitigation shall be provided except when the applicant demonstrates and the City concurs that greater functional and habitat value can be achieved through out-of-kind mitigation.
4. Only when it is determined by the City that subsections (C)(1), (2), and (3) of this section are inappropriate and impractical shall off-site, out-of-kind mitigation be considered.



5. When wetland mitigation is permitted by these regulations on-site or off-site, the mitigation project shall occur near an adequate water supply (river, stream, ground water) with a hydrologic connection to the proposed wetland mitigation area to ensure successful development or restoration.
6. Any agreed upon mitigation proposal shall be completed prior to project construction, unless a phased schedule that assures completion concurrent with project construction, has been approved by the City.
7. Wetland acreage replacement ratios shall be as specified in this section.
8. When wetland mitigation is permitted by these regulations, native plant materials salvaged from the original wetland area shall be utilized to the maximum extent possible.

#### **D. Wetland Replacement Ratios.**

1. Where wetland alterations are permitted by the City, the applicant shall restore or create areas of wetlands in order to compensate for wetland losses. Equivalent areas shall be determined according to acreage, function, type, location, timing factors and projected success of restoration or creation.
2. When creating or enhancing wetlands, the following acreage replacement ratios shall be used:

**Table 20.80.350D**

Wetland Type	Wetland Creation Replacement Ratio (Area)	Wetland Enhancement Ratio (Area)
Type I	6:1	<del>2</del> 16:1
Type II	<del>2</del> 3:1	<del>4</del> 12:1
Type III	2:1	<del>4</del> 8:1
Type IV	1.25:1	<del>4</del> 6:1

The wetland replacement and enhancement ratios are proposed to be increased consistent with Ecology's recommendations (publication 04-06-024, Appendix 8-C).

The Department shall have discretion to increase these standards where mitigation is to occur off-site or in other appropriate circumstances based on the recommendations of a wetlands report that includes best available science and is prepared by a qualified professional.

3. Enhanced wetlands shall have higher wetland values and functions than the altered wetland. The values and functions transferred shall be of equal or greater quality to assure no net loss of wetland values and functions.
4. Enhanced and created wetlands shall be appropriately classified and buffered.
5. An enhanced or created wetland and its associated buffer shall be placed either in a separate tract on which development is prohibited, protected by execution of an easement, dedicated to a conservation organization or land trust, or similarly preserved through a permanent protective mechanism acceptable to the City and shall be recorded with the King County Department of Records.

**E. Wetlands Performance Standards.** The performance standards in this section shall be incorporated into mitigation plans submitted to the City for impacts to critical areas. In addition, the City may prepare a technical manual which includes guidelines and requirements for report preparation. The following performance standards shall apply to any mitigations proposed within Type I, Type II, Type III and Type IV wetlands and their buffers.

1. Plants indigenous to the region (not introduced or foreign species) shall be used.
2. Plant selection shall be consistent with the existing or projected hydrologic regime, including base water levels and stormwater event fluctuations.
3. Plants should be commercially available or available from local sources.
4. Plant species high in food and cover value for fish and wildlife shall be used.
5. Mostly perennial species should be planted.
6. Committing significant areas of the site to species that have questionable potential for successful establishment shall be avoided.
7. Plant selection must be approved by a qualified consultant.
8. The following standards shall apply to wetland design and construction:
  - a. Water depth shall not exceed six and one-half feet (two meters).

- b. The grade or slope that water flows through the wetland shall not exceed six percent.
  - c. Slopes within the wetland basin and the buffer zone shall not be steeper than 3:1 (horizontal to vertical).
  - d. The wetland (excluding the buffer area) should not contain more than 60 percent open water as measured at the seasonal high water mark.
9. Substrate should consist of a minimum of one foot, in depth, of clean (uncontaminated with chemicals or solid/hazardous wastes) inorganic/organic materials.
10. Planting densities and placement of plants should be determined by a qualified consultant and shown on the design plans.
11. The planting plan shall be approved by the City.
12. Stockpiling should be confined to upland areas and contract specifications should limit stockpiling of earthen materials to durations in accordance with City clearing and grading standards, unless otherwise approved by the City.
13. Planting instructions shall be submitted which describe proper placement, diversity, and spacing of seeds, tubers, bulbs, rhizomes, sprigs, plugs, and transplanted stock.
14. Controlled release fertilizer shall be applied (if required) at the time of planting and

afterward only as plant conditions warrant (determined during the monitoring process).

15. An irrigation system shall be installed, if necessary, for the initial establishment period.
16. All construction specifications and methods shall be approved by a qualified consultant and the City.
17. Construction management shall be provided by a qualified consultant. On-going work on-site shall be inspected by the City.

**F. Approved Wetland Mitigation Projects – Signature.** On completion of construction, any approved mitigation project shall be signed off by the applicant's qualified consultant and approved by the City. Signature of the qualified consultant and approval by the City will indicate that the construction has been completed as planned.

**G. Monitoring Program and Contingency Plan.**

1. A monitoring program shall be implemented by the applicant to determine the success of the mitigation project and any necessary corrective actions. This program shall determine if the original goals and objectives are being met.
2. A contingency plan shall be established for indemnity in the event that the mitigation project is inadequate or fails. A performance and maintenance bond or other acceptable ~~security device~~ financial guarantee is required to ensure the applicant's compliance with the terms of the mitigation agreement. The amount of the performance and maintenance bond shall equal 125

percent of the cost of the mitigation project for a minimum of five years. The bond may be reduced in proportion to work successfully completed over the period of the bond. The bonding period shall coincide with the monitoring period.

3. Monitoring programs prepared to comply with this section shall reflect the following guidelines:
  - a. Scientific procedures shall be used to establish the success or failure of the project.
  - b. For vegetation determinations, permanent sampling points shall be established.
  - c. Vegetative success shall, at a minimum, equal 80 percent survival of planted trees and shrubs and 80 percent cover of desirable understory or emergent plant species at the end of the required monitoring period. Additional standards for vegetative success, including (but not limited to) minimum survival standards following the first growing season, may be required after consideration of a report prepared by a qualified consultant.
  - d. Monitoring reports on the current status of the mitigation project shall be submitted to the City. The reports are to be prepared by a qualified consultant and reviewed by the City or a consultant retained by the City and should include monitoring information on wildlife, vegetation, water quality, water flow, stormwater storage and conveyance, and existing or potential degradation, as applicable, and shall be produced on the

following schedule: at the time of construction; 30 days after planting; early in the growing season of the first year; at the end of the growing season of the first year; twice during the second year; and annually thereafter.

- e. Monitoring programs shall be established for a minimum of five years.
- f. If necessary, failures in the mitigation project shall be corrected.
- g. Dead or undesirable vegetation shall be replaced with appropriate plantings.
- h. Damage caused by erosion, settling, or other geomorphological processes shall be repaired.
- i. The mitigation project shall be re-designed (if necessary) and the new design shall be implemented and monitored, as is subsection (G)(3)(d) of this section.
- j. Correction procedures shall be approved by a qualified consultant and the City. (Ord. 238 Ch. VIII § 5(E), 2000).

## **Subchapter 5. Flood Hazard Areas**

### **20.80.360 Description and purpose.**

- A. A flood hazard area consists of the following components: floodplain; flood fringe; zero-rise floodway; and Federal Emergency Management Agency (FEMA) floodway.

B. It is the purpose of these regulations to ensure that the City of Shoreline meets the requirements of the National Flood Insurance Program and maintains the City as an eligible community for Federal flood insurance benefits. (Ord. 238 Ch. VIII § 6(A), 2000).

C. A tsunami hazard area may be designated as a flood hazard area by the Federal or State Government.

#### **20.80.370 Classification.**

Flood hazard areas shall be determined after obtaining, reviewing and utilizing base flood elevations and available floodway data for a flood having a one percent chance of being equaled or exceeded in any given year, often referred to as the "100-year flood." The base flood is determined for existing conditions, and is shown on Flood Insurance Rate Maps for King County (FIRM) and incorporated areas, current version; or mapped on the King County Sensitive Areas Folio, unless a more complete basin plan including projected flows under future developed conditions has been completed and adopted by the City of Shoreline, in which case these future flow projections shall be used. In areas where the flood insurance study for the City includes detailed base flood calculations, those calculations may be used. (Ord. 238 Ch. VIII § 6(B), 2000).

#### **20.80.380 Flood fringe – Development standards and permitted alterations.**

A. Development proposals shall not reduce the effective base flood storage volume of the floodplain. Grading or other activity which would reduce the effective storage volume shall be mitigated by creating compensatory storage on the site or off the site if legal arrangements can be made to assure that the effective compensatory storage volume will be preserved over time.



B. No structure shall be allowed which would be at risk due to stream bank destabilization including, but not limited to, that associated with channel relocation or meandering.

C. All elevated construction shall be designed and certified by a professional structural engineer licensed by the State of Washington and the design shall be approved by the City prior to construction.

D. Subdivisions, short subdivisions, lot line adjustments and binding site plans shall meet the following requirements:

1. New building lots shall contain no less than 5,000 square feet of buildable land outside the zero-rise floodway, and building setback areas shall be shown on the face of the plat to restrict permanent structures to this buildable area;

2. All utilities and facilities such as stormwater facilities, sewer, gas, electrical and water systems shall be located and constructed consistent with the standards and requirements of this section;

3. Base flood data and flood hazard notes shall be shown on the face of the recorded subdivision, short subdivision, lot line adjustment or binding site plan including, but not limited to, the base flood elevation, required flood protection elevations and the boundaries of the floodplain and the zero-rise floodway, if determined; and

4. The following notice shall also be shown on the face of the recorded subdivision, short subdivision, lot line adjustment or binding site plan for all affected lots:

**NOTICE**

***Lots and structures located within Flood Hazard Areas may be inaccessible by emergency vehicles during flood events. Residents and property owners should take appropriate advance precautions.***

- E. New residential structures and improvements that include the creation of new impervious surfaces associated with existing residential structures shall meet the following requirements:
1. The lowest floor shall be elevated to the flood protection elevation;
  2. Portions of a structure which are below the lowest floor area shall not be fully enclosed. The areas and rooms below the lowest floor shall be designed to automatically equalize hydrostatic and hydrodynamic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for satisfying this requirement shall meet or exceed the following requirements:
    - a. A minimum of two openings on opposite walls having a total open area of not less than one square inch for every square foot of enclosed area subject to flooding shall be provided;
    - b. The bottom of all openings shall be no higher than one foot above grade; and
    - c. Openings may be equipped with screens, louvers or other coverings or devices if they permit the unrestricted entry and exit of floodwaters;

3. Materials and methods which are resistant to and minimize flood damage shall be used; and
4. All electrical, heating, ventilation, plumbing, air conditioning equipment and other utility and service facilities shall be floodproofed to or elevated above the flood protection elevation.

F. New nonresidential structures and substantial improvements of existing nonresidential structures shall meet the following requirements:

1. **Elevation.**

- a. Requirements for residential structures contained in subsection (E)(1) of this section shall be met; or
- b. The structure shall be floodproofed to the flood protection elevation and shall meet the following requirements:
  - i. The applicant shall provide certification by a professional civil or structural engineer licensed by the State of Washington that the floodproofing methods are adequate to withstand the flood depths, pressures, velocities, impacts, uplift forces and other factors associated with the base flood. After construction, the engineer shall certify that the permitted work conforms with the approved plans and specifications; and
  - ii. Approved building permits for floodproofed nonresidential structures shall contain a statement

notifying applicants that flood insurance premiums shall be based upon rates for structures which are one foot below the floodproofed level;

2. Materials and methods which are resistant to and minimize flood damage shall be used; and
3. All electrical, heating, ventilation, plumbing, air conditioning equipment and other utility and service facilities shall be floodproofed to or elevated above the flood protection elevation.

G. All new construction shall be anchored to prevent flotation, collapse or lateral movement of the structure.

H. Mobile homes and mobile home parks shall not be permitted in flood hazard areas.

I. Utilities shall meet the following requirements:

1. New and replacement utilities including, but not limited to, sewage treatment facilities shall be floodproofed to or elevated above the flood protection elevation;
2. Aboveground utility transmission lines, other than electric transmission lines, shall only be allowed for the transport of nonhazardous substances; and
3. Buried utility transmission lines transporting hazardous substances shall be installed at a minimum depth of four feet below the maximum depth of scour for the base flood, as predicted by a professional civil engineer licensed by the State of Washington, and

shall achieve sufficient negative buoyancy so that any potential for flotation or upward migration is eliminated.

- J. Critical facilities may be allowed within the flood fringe of the floodplain, but only when no feasible alternative site is available. Critical facilities shall be evaluated through the conditional or special use permit process. Critical facilities constructed within the flood fringe shall have the lowest floor elevated to three or more feet above the base flood elevation. Floodproofing and sealing measures shall be taken to ensure that hazardous substances will not be displaced by or released into floodwaters. Access routes elevated to or above the base flood elevation shall be provided to all critical facilities from the nearest maintained public street or roadway.
  
- K. Prior to approving any permit for alterations in the flood fringe, the City shall determine that all permits required by State or Federal law have been obtained. (Ord. 238 Ch. VIII § 6(C), 2000).

**20.80.390 Zero-rise floodway – Development standards and permitted alterations.**

- A. The requirements which apply to the flood fringe shall also apply to the zero-rise floodway. The more restrictive requirements shall apply where there is a conflict.
  
- B. A development proposal including, but not limited to, new or reconstructed structures shall not cause any increase in the base flood elevation unless the following requirements are met:
  - 1. Amendments to the flood insurance rate map are adopted by FEMA, in accordance with 44 CFR 70, to incorporate the increase in the base flood elevation; and

2. Appropriate legal documents are prepared in which all property owners affected by the increased flood elevations consent to the impacts on their property. These documents shall be filed with the title of record for the affected properties.
- C. The following are presumed to produce no increase in base flood elevation and shall not require a special study to establish this fact:
1. New residential structures outside the FEMA floodway on lots in existence before November 27, 1990, which contain less than 5,000 square feet of buildable land outside the zero-rise floodway and which have a total building footprint of all proposed structures on the lot of less than 2,000 square feet;
  2. Substantial improvements of existing residential structures in the zero-rise floodway, but outside the FEMA floodway, where the footprint is not increased; or
  3. Substantial improvements of existing residential structures meeting the requirements for new residential structures in this title.
- D. Post or piling construction techniques which permit water flow beneath a structure shall be used.
- E. All temporary structures or substances hazardous to public health, safety and welfare, except for hazardous household substances or consumer products containing hazardous substances, shall be removed from the zero-rise floodway during the flood season from September 30th to May 1st.

- F. New residential structures or any structure accessory to a residential use shall meet the following requirements:
1. The structures shall be outside the FEMA floodway; or
  2. The structures shall be on lots in existence before November 27, 1990, which contain less than 5,000 square feet of buildable land outside the zero-rise floodway. Structures shall be designed and situated to minimize encroachment into the zero-rise floodway.
- G. Utilities may be allowed within the zero-rise floodway if the City determines that no feasible alternative site is available, subject to the requirements of this section. Construction of sewage treatment facilities shall be prohibited.
- H. Critical facilities shall not be allowed within the zero-rise floodway except as provided in subsection (I) of this section.
- I. Structures and installations which are dependent upon the floodway may be located in the floodway if the development proposal is approved by all agencies with jurisdiction. Such structures include, but are not limited to:
1. Dams or diversions for water supply, flood control, or fisheries enhancement;
  2. Flood damage reduction facilities, such as levees and pumping stations;
  3. Stream bank stabilization structures where no feasible alternative exists for protecting public or private property;

4. Stormwater conveyance facilities subject to the development standards for streams and wetlands and the surface water design manual;
5. Boat launches and related recreation structures;
6. Bridge piers and abutments; and
7. Other fisheries enhancement or stream restoration projects. (Ord. 238 Ch. VIII § 6(D), 2000).

**20.80.400 FEMA floodway – Development standards and permitted alterations.**

- A. The requirements which apply to the zero-rise floodway shall also apply to the FEMA floodway. The more restrictive requirements shall apply where there is a conflict.
- B. A development proposal including, but not limited to, new or reconstructed structures shall not cause any increase in the base flood elevation.
- C. New residential or nonresidential structures shall be prohibited within the FEMA floodway.
- D. Substantial improvements of existing residential structures in the FEMA floodway, meeting the requirements of WAC 173-158-070, as amended, are presumed to produce no increase in base flood elevation and shall not require a special study to establish this fact. (Ord. 238 Ch. VIII § 6(E), 2000).

**20.80.410 Flood hazard areas – Certification by engineer or surveyor.**

- A. For all new structures or substantial improvements in a flood hazard area, the applicant shall provide



certification by a professional civil engineer or land surveyor licensed by the State of Washington of:

1. The actual as-built elevation of the lowest floor, including basement; and
  2. The actual as-built elevation to which the structure is floodproofed, if applicable.
- B. The engineer or surveyor shall indicate if the structure has a basement.
- C. The City shall maintain the certifications required by this section for public inspection. (Ord. 238 Ch. VIII § 6(F), 2000).

### **Subchapter 6. Aquifer Recharge Areas**

#### **20.80.420 Description and purpose.**

- A. Aquifer recharge areas provide a source of potable water and contribute to stream discharge during periods of low flow. Urban-type pollutants may enter watercourse supplies through potential infiltration of pollutants through the soil to ground water aquifers.
- B. The primary purpose of aquifer recharge area regulations is to protect aquifer recharge areas by providing for regulation of land use activities that pose a risk of potential aquifer contamination and to minimize impacts through the application of strict performance standards. (Ord. 238 Ch. VIII § 7(A), 2000).

#### **20.80.430 Classification.**

Aquifer recharge areas shall be classified based on the soil and ground water conditions and risks to surface water during periods of low hydrology. Classification depends on the combined effects of hydrogeological susceptibility to contamination and contaminant loading potential, and includes upland areas underlain by soils consisting largely of silt, clay or glacial till, upland areas underlain by soils consisting largely of sand and gravel, and wellhead protection areas and areas underlain by soils consisting largely of sand and gravel in which there is a predominantly downward or lateral component to ground water flow. (Ord. 238 Ch. VIII § 7(B), 2000).

#### **20.80.440 Alteration.**

The following land uses and activities shall require implementation of Best Management Practices (BMPs) as established by the Department of Ecology:

- A. Land uses and activities that involve the use, storage, transport or disposal of significant quantities of chemicals, substances or materials that are toxic, dangerous or hazardous, as those terms are defined by State and Federal regulations.
  
- B. On-site community sewage disposal systems.
  
- C. Underground storage of chemicals.
  
- D. Petroleum pipelines.
  
- E. Solid waste landfills. (Ord. 238 Ch. VIII § 7(C), 2000).

#### **20.80.450 Performance standards and requirements.**

Any uses or activities located in a aquifer recharge area, as defined within this subchapter, that involve the use, storage, transport or disposal of significant quantities of chemicals, substances, or materials that

are toxic, dangerous or hazardous, as those terms are defined by State and Federal regulations, shall comply with the following additional standards:

- A. Underground storage of chemicals, substances or materials that are toxic, hazardous or dangerous is discouraged.
- B. Any chemicals, substances or materials that are toxic, hazardous or dangerous shall be segregated and stored in receptacles or containers that meet State and Federal standards.
- C. Storage containers shall be located in a designated, secured area that is paved and able to contain leaks and spills, and shall be surrounded by a containment dike.
- D. Secondary containment devices shall be constructed around storage areas to retard the spread of any spills and a monitoring system should be implemented.
- E. A written operations plan shall be developed, including procedures for loading/unloading liquids and for training of employees in proper materials handling.
- F. An emergency response/spill clean-up plan shall be prepared and employees properly trained in to react to accidental spills.
- G. Any aboveground storage tanks shall be located within a diked containment area on an impervious surface. The tanks shall include overfill protection systems and positive controls on outlets to prevent uncontrolled discharges.
- H. Development should be clustered and impervious surfaces limited where possible.

- I. No waste liquids or chemicals of any kind shall be discharged to storm sewers.
- J. All development shall implement Best Management Practices (BMPs) for water quality, as approved by the City, including the standards contained within the City of Shoreline Stormwater Design Manual, such as biofiltration swales and use of oil-water separators, and BMPs appropriate to the particular use proposed. (Ord. 238 Ch. VIII § 7(D), 2000).

**Subchapter 7. Stream Areas**

**20.80.460 ~~Description~~ Designation and purpose.**

- A. Streams are those areas where open surface waters produce a defined channel or bed, not including irrigation ditches, canals, storm or surface water runoff devices or other entirely artificial open watercourses, unless they are used by salmonids or are used to convey streams naturally occurring prior to construction. A channel or bed need not contain water year-round, provided that there is evidence of at least intermittent flow during years of normal rain fall.
- B. Stream areas and their associated buffers provide important fish and wildlife habitat and corridors; help to maintain water quality; store and convey stormwater and floodwater; recharge groundwater; and serve as areas for recreation, education and scientific study and aesthetic appreciation.
- BC. The primary purpose of the stream area regulations is to avoid impacts to streams and associated riparian corridors and where possible, provide for stream enhancement and rehabilitation. (Ord. 238 Ch. VIII § 8(A), 2000).

The definition of streams is added to the beginning of the streams regulations to clarify what areas the regulations apply to.

**20.80.470 Classification.**

Streams shall be designated ~~Type I, Type II, Type III, and Type IV~~ according to the criteria in this section. When more than one stream type is present in short alternating segments on a subject property, it will be classified according to the stream type which is more restrictive.

A. "Type I streams" are those streams identified as "Shorelines of the State" under the City Shoreline Master Program.

~~BA.~~ "Type II streams" are those ~~natural~~ streams that are ~~not Type I streams and are~~ either perennial or intermittent and have salmonid fish use~~have one of the following characteristics:~~

- ~~1. Salmonid fish use;~~
- ~~2. Potential for salmonid fish use; or~~
- ~~3. Significant recreational value.~~

~~CB.~~ "Type III streams" are those ~~natural~~ streams with perennial (year-round) or intermittent flow and are not used by salmonid fish ~~and have no potential to be used by salmonid fish.~~

~~DC.~~ "Type IV streams" are those streams ~~and natural drainage swales~~ with perennial or intermittent flow with channel width less than two feet taken at the ordinary high water mark that are not used by salmonid fish.

D. For the purposes of this section, "salmonid fish use" and "used by salmonid fish" is presumed for:

The classification of type II streams is simplified to focus on salmonid fish use as the qualifying factor.

Subsection D is proposed to clarify the term "salmonid fish use". Salmonid fish use is defined for where fish have been documented as well as where they are presumed based on passability or planned restoration.

1. Streams where naturally reoccurring use by salmonid populations has been documented by a government agency;
2. Streams that are fish passable by salmonid populations from Lake Washington or Puget Sound, as determined by a qualified professional based on review of stream flow, gradient and barriers and criteria for fish passability established by the Washington Department of Fish and Wildlife; and
3. Streams that are planned for restoration in a 6-year capital improvement plan adopted by a government agency that will result in a fish passable connection to Lake Washington or Puget Sound.

The Department may waive the presumption of salmonid fish use for stream segments where a qualified professional has determined there are confirmed, long term water quality parameters making the stream segment incapable of supporting fish.

~~E. “Intentionally created streams” are those manmade streams defined as such in these regulations, and do not include streams created as mitigation. Purposeful creation must be demonstrated to the City through documentation, photographs, statements and/or other evidence. Intentionally created streams may include irrigation and drainage ditches, grass-lined swales and canals. Intentionally created streams are excluded from regulation under this subchapter, except manmade streams that provide critical habitat for species of fish and wildlife that are proposed or listed by the Federal government or State of Washington as endangered, threatened, critical, or priority species. Intentionally created streams that provide documented critical habitat for these species shall be classified and treated as natural streams. (Ord. 238 Ch. VIII § 8(B), 2000).~~

Subsection E on intentionally created streams is removed because it creates confusion and conflict with the definition of streams, which does not include artificially created watercourses (as opposed to “intentionally created” ones).

**20.80.480 Required buffer areas.**

A. Required buffer widths shall reflect the sensitivity of the stream type, the risks associated with development and, in those circumstances permitted by these regulations, the type and intensity of human activity and site design proposed to be conducted on or near the stream area. Stream buffers shall be measured from the ordinary high water mark (OHWM) or the top of the bank, if the OHWM can not be determined.

B. The following buffers are established for streams:

**Table 20.80.480B**

Stream Type	Maximum Standard Buffer Width (ft)	Minimum Buffer Width (ft)
Type I	150	<del>400</del> <u>115</u>
Type II	<del>400</del> <u>115</u>	75
Type III	<del>50</del> <u>65</u>	<del>25</del> <u>35</u>
Type IV	<del>25</del> <u>35</u>	<del>40</del> <u>25</u>

Review of science indicates that larger buffers tend to provide greater protection and that very small buffers provide only minimal protective function. Therefore it is proposed to increase some of the buffers to be more consistent with the WRIA 8 recommendations.

The following language is revised for clarity and to state that a smaller buffer must protect the wetland functions.

C. The ~~maximum standard~~ buffer width ~~will shall~~ be established, provided that the buffer may be reduced to the minimum buffer listed above if unless the applicant can demonstrate that a smaller buffer is adequate to protect the stream functions and implements one or more enhancement measures to result in a net improvement to the stream and buffer. The measures determined most applicable and/or appropriate will be considered in reducing buffer requirements. These include but are not limited to:

1. Removal of fish barriers to restore accessibility to anadromous fish.

2. Enhancement of fish habitat using log structures incorporated as part of a fish habitat enhancement plan.
  3. Enhancement of fish and wildlife habitat structures that are likely to be used by wildlife, including wood duck houses, bat boxes, nesting platforms, snags, rootwads/stumps, birdhouses, and heron nesting areas.
  4. Additional enhancement measures may include:
    - a. Planting native vegetation within the buffer area, especially vegetation that would increase value for fish and wildlife, increase stream bank or slope stability, improve water quality, or provide aesthetic/recreational value; or
    - b. Creation of a surface channel where a stream was previously underground, in a culvert or pipe. Surface channels which are “daylighted” shall be located within a buffer area and shall be designed with energy dissipating functions such as meanders to reduce future erosion;
    - c. Removal or modification of existing stream culverts (such as at road crossings) to improve fish passage and flow capabilities; or
    - d. Upgrading of retention/detention facilities or other drainage facilities beyond required levels.
- D. No structures or improvements shall be permitted within the stream buffer area, including buildings,



decks, docks, except as otherwise permitted or required under the City's adopted Shoreline Master Program, or under one of the following circumstances:

1. When the improvements are part of an approved rehabilitation or mitigation plan; or
2. For the construction of new roads and utilities, and accessory structures, when no feasible alternative location exists; or
3. The construction of trails, consistent with the following criteria:
  - a. Trails should be constructed of permeable materials;
  - b. Trails shall be designed in a manner that minimizes impact on the stream system;
  - c. Trails shall have a maximum trail corridor width of 10 feet; and
  - d. Trails should be located within the outer half of the buffer, i.e., that portion of the buffer that is farther away from the stream; or
4. The construction of footbridges; or
5. The construction and placement of informational signs or educational demonstration facilities limited to no more than one square yard surface area and four feet high, provided there is no permanent infringement on stream flow; or

6. The establishment of stormwater management facilities, such as grass lined swales, when located outside of the minimum buffer area as set forth in the Table 20.80.480B.

E. The City may extend the width of the buffer on the basis of site-specific analysis when necessary to comply with an adopted basin plan in accordance with City, County, State or Federal plans to preserve endangered or threatened species.

F. Stream buffer widths may be modified by averaging buffer widths as set forth herein. Buffer width averaging shall be allowed only where the applicant demonstrates to the City:

~~1. Buffer width averaging shall be allowed only where the applicant demonstrates to the City that the stream contains variations in sensitivity due to existing physical characteristics, that lower intensity land uses would be located adjacent to areas where buffer width is reduced;~~

1. The ecological structure and function of the buffer after averaging is equivalent to or greater than the structure and function before averaging;

2. and ~~that~~ that the total area contained within the buffer after averaging is no less than that contained within the standard buffer prior to averaging.

23. Buffer averaging shall not result in the buffer width being reduced by more than 25 percent of the required buffer as set forth in the table in subsection B of this section and in no case may the buffer be less than 25 feet in the stated minimum width.

The subsection on stream buffer averaging is outlined to make it easier to follow the specific criteria. The criteria are revised to be more in line with the code adopted by King County following best available science review. The "sensitivity" statement is rephrased at the end of the subsection to make it clearer how sensitivity relates to buffer averaging.

The City may require buffer averaging to be designed to protect areas of greater sensitivity and function based on the recommendations of a stream report prepared by a qualified professional.

G. ~~Relocation of a Type I, II, III stream in order to facilitate general site design shall not be allowed. Relocation of these classes of streams may take place~~ only when the proposed relocation is part of an approved mitigation or rehabilitation plan, will result in equal or better habitat and water quality, and will not diminish the flow capacity of the stream.

H. Restoring piped watercourses.

1. The city encourages the opening of previously channelized/culverted streams and the rehabilitation and restoration of streams.

2. When piped watercourse sections are restored, a protective buffer shall be required of the stream section. The buffer distance shall be based on an approved restoration plan, regardless of stream classification, and shall be a minimum of 10 feet to allow for restoration and maintenance. The stream and buffer area shall include habitat improvements and measures to prevent erosion, landslide and water quality impacts. Opened channels shall be designed to support fish access, unless determine to be unfeasible by the City.

3. Removal of pipes conveying streams shall only occur when the City determines that the proposal will result in a net improvement of water quality and ecological functions and will not significantly increase the threat of erosion, flooding, slope stability or other hazards.

Subsection H is proposed to encourage watercourse restoration and to recognize that standard buffers discourage such restoration. It also establishes a review process for restoration to ensure that it doesn't result in negative impacts.

4. Where the buffer of the restored stream would extend beyond a required setback on an adjacent property, the applicant shall seek written agreement from the affected neighboring property owner.

(Ord. 299 § 1, 2002; Ord. 238 Ch. VIII § 8(C), 2000).

#### **20.80.490 Alteration.**

- A. Bridges shall be used to cross Type I streams. Culverted crossings and other obstructive means of crossing Type I streams shall be prohibited.
- B. Culverts are allowable only under the following circumstances:
  1. Crossing of Type II, III, and IV streams;
  2. When fish passage will not be impaired;
  3. When the following design criteria are met:
    - a. Oversized culverts will be installed;
    - b. Culverts will include gradient controls and creation of pools within the culvert for Type II streams where appropriate; and
    - c. Gravel substrate will be placed in the bottom of the culvert to a minimum depth of one foot for Type II streams;
  4. The applicant or successors shall, at all times, keep any culvert free of debris and sediment to allow free passage of water and, if applicable, fish.

- C. The City may require that a culvert be removed from a stream as a condition of approval, unless it is demonstrated conclusively that the culvert is not detrimental to fish habitat or water quality, or removal would be detrimental to fish or wildlife habitat or water quality. (Ord. 238 Ch. VIII § 8(D), 2000).

**20.80.500 Mitigation performance standards and requirements.**

- A. **Appropriate Stream Mitigation Sequence and Actions.** Where impacts cannot be avoided, and the applicant has exhausted feasible design alternatives, the applicant or property owner shall seek to implement other appropriate mitigation actions in compliance with the intent, standards and criteria of this section. In an individual case, these actions may include consideration of alternative site plans and layouts, reductions in the density or scope of the proposal, and/or implementation of the performance standards listed in this section.
  
- B. Significant adverse impacts to stream area functions and values shall be mitigated. Mitigation actions shall be implemented in the preferred sequence: Avoidance, minimization, restoration and replacement. Proposals which include less preferred and/or compensatory mitigation shall demonstrate that:
  - 1. All feasible and reasonable measures will be taken to reduce impacts and losses to the stream, or to avoid impacts where avoidance is required by these regulations; and
  
  - 2. The restored, created or enhanced stream area or buffer will be available and persistent as the stream or buffer area it replaces; and
  
  - 3. No overall net loss will occur in stream functions and values.

### **C. Location and Timing of Stream Mitigation.**

1. Mitigation shall be provided on-site, unless on-site mitigation is not scientifically feasible due to the physical features of the property. The burden of proof shall be on the applicant to demonstrate that mitigation cannot be provided on-site.
2. When mitigation cannot be provided on-site, mitigation shall be provided in the immediate vicinity of the permitted activity on property owned or controlled by the applicant such as an easement, provided such mitigation is beneficial to the critical area and associated resources. It is the responsibility of the applicant to obtain title to off-site mitigation areas.
3. In-kind mitigation shall be provided except when the applicant demonstrates and the City concurs that greater functional and habitat value can be achieved through out-of-kind mitigation.
4. Only when it is determined by the City that subsections (B)(1), (2), and (3) of this section are inappropriate and impractical shall off-site, out-of-kind mitigation be considered.
5. When stream mitigation is permitted by these regulations on-site or off-site, the mitigation project shall occur near an adequate water supply (river, stream, ground water) with a hydrologic connection to the mitigation area to ensure successful development or restoration.
6. Any agreed upon mitigation proposal shall be completed prior to project construction, unless a phased schedule, that assures

completion concurrent with project construction, has been approved by the City.

7. Restored or created streams, where permitted by these regulations, shall be an equivalent or higher stream value or function than the altered stream.
- D. The performance standards in this section and the relevant performance standards located within the wetland standards of SMC 20.80.350(E)(1) through (17) shall be incorporated into mitigation plans submitted to the City for impacts to critical areas. In addition, the City may prepare a technical manual which includes guidelines and requirements for report preparation. The performance standards shall apply to any mitigations proposed within Type I, Type II or Type III streams within the City.
- E. On completion of construction, any approved mitigation project must be signed off by the applicant's qualified consultant and approved by the City. Signature of the qualified consultant and approval by the City will indicate that the construction has been completed as planned.
- F. **Monitoring Program and Contingency Plan.** A monitoring program shall be implemented by the applicant to determine the success of the mitigation project and any necessary corrective actions. This program shall determine if the original goals and objectives are being met. The monitoring program will be established consistent with the guidelines contained in SMC 20.80.350(G). (Ord. 238 Ch. VIII § 8(E), 2000).

This page intentionally left blank



# ATTACHMENT III

## Draft Revisions

### Chapter 20.50 Development Standards

#### Subchapter . Tree Conservation, Land Clearing and Site Grading Standards

- 20.50.290 Purpose.
- 20.50.300 General requirements.
- 20.50.310 Exemptions from permit.
- 20.50.320 Specific activities subject to the provisions of this subchapter.
- 20.50.330 Project review and approval.
- 20.50.340 Basic operating conditions and standards of performance.
- 20.50.350 Development standards for clearing activities.
- 20.50.360 Tree replacement and site restoration.
- 20.50.370 Tree protection standards.
- 20.50.290 Purpose.**

The purpose of this subchapter is to reduce the environmental impacts of site development while promoting the reasonable use of land in the City by addressing the following:

- A. Prevention of damage to property, harm to persons, and environmental impacts caused by excavations, fills, and the destabilization of soils;
- B. Protection of water quality from the adverse impacts associated with erosion and sedimentation;
- C. Promotion of building and site planning practices that are consistent with the City's natural topography and vegetative cover;
- D. Preservation and enhancement of trees and vegetation which contribute to the visual quality and economic value of development in the City and provide continuity and screening between developments;

- E. Protection of critical areas from the impacts of clearing and grading activities;
- F. Conservation and restoration of trees and vegetative cover to reduce flooding, the impacts on existing drainageways, and the need for additional stormwater management facilities;
- G. Protection of anadromous fish and other native animal and plant species through performance based regulation of clearing and grading;
- H. Retention of tree clusters for the abatement of noise, wind protection, and mitigation of air pollution;
- I. Rewarding significant tree protection efforts by granting flexibility for certain other development requirements;
- J. Providing measures to protect trees that may be impacted during construction;
- K. Promotion of prompt development, effective erosion control, and restoration of property following site development; and
- L. Replacement of trees removed during site development in order to achieve a goal of no net loss of tree cover throughout the City over time. (Ord. 238 Ch. V § 5(A), 2000).

**20.50.300 General requirements.**

- A. Tree cutting or removal by any means is considered a type of clearing and is regulated subject to the limitations and provisions of this subchapter.

- B. All land clearing and site grading shall comply with all standards and requirements adopted by the City of Shoreline. Where a Development Code section or related manual or guide contains a provision that is more restrictive or specific than those detailed in this subchapter, the more restrictive provision shall apply.
  
- C. **Permit Required.** No person shall conduct clearing or grading activities on a site without first obtaining the appropriate permit approved by the Director, unless specifically exempted by SMC 20.50.310.
  
- D. When clearing or grading is planned in conjunction with a new or expanded building or complex that is not exempt from the provisions of this subchapter, all of the required application materials for approval of tree removal, clearing and rough grading of the site shall accompany the development application to allow concurrent review.
  
- E. The Director may require the submittal of required application materials for approval of tree removal, clearing and rough grading of the site with an application for formal subdivision, short subdivision, conditional use or any other land use approval in order to meet the purpose and intent of this subchapter.
  
- F. A clearing and grading permit shall be required if the regulated activity is not associated with another development application on the site that requires a permit.
  
- G. No clearing shall be allowed on a site for the sake of preparing that site for sale or future development where no specific plan for future development has been submitted. The Director may issue a clearing and grading permit as part of a phased development plan where a conceptual plan for development of the property

has been submitted to the City and the owner or developer agrees to submit an application for a building permit or other site development permit in less than 12 months.

- H. Replacement trees planted under the requirements of this subchapter on any parcel in the City of Shoreline may not be removed without the written approval of the Department.
  
- I. Any disturbance to vegetation within critical areas and their corresponding buffers is subject to the procedures and standards contained within the critical areas overlay district chapter of the Shoreline Development Code, Chapter 20.80 SMC, Special Districts, in addition to the standards of this subchapter. The standards which result in the greatest protection of the critical areas shall apply. (Ord. 238 Ch. V § 5(B), 2000).

**20.50.310 Exemptions from permit.**

A. **Complete Exemptions.** The following activities are exempt from the provisions of this subchapter and do not require a permit:

- 1. Emergency situations ~~on private property~~ involving danger to life or property or substantial fire hazards. Any hazardous tree or vegetation which is an immediate threat to public health, safety, or welfare, or property may be removed without first obtaining a permit regardless of any other provision contained in this subchapter. If possible, trees should be evaluated prior to removal using the International Society of Arboriculture method, Hazard Tree Analysis for Urban Areas, in its most recent adopted form. The party removing the tree ~~will~~ shall contact the City regarding the emergency, if practicable, prior to removing the tree, and no later than one working day following the emergency. After the emergency, the

The emergency exemption is revised to require the party involved to contact the City within one day after the emergency, and to require professional evaluation and site restoration following the emergency.

The section is also changed to apply to both private and public property.

person or agency taking the action shall conduct a professional evaluation and perform site restoration consistent with SMC 20.50.330 and 20.50.360.

2. Removal of trees and/or ground cover by the City and/or utility provider in situations involving immediate danger to life or property, substantial fire hazards, or interruption of services provided by a utility. The City retains the right to dispute the emergency and require that the party obtain a clearing permit and/or require that replacement trees be replanted as mitigation.
3. Installation and regular maintenance of public utilities, under direction of the Director, except substation construction and installation or construction of utilities in parks or environmentally sensitive areas.
4. Cemetery graves involving less than 50 cubic yards of excavation, and related fill per each cemetery plot.
5. Tree and vegetation removal in accordance with an approved Critical Area Stewardship Plan.
6. Removal of trees from property zoned RB & I, CB & NCB and NB & O, unless within a Critical Area or Critical Area Buffer.

This amendment would exclude commercial zoning districts from the provisions of tree conservation.

**B. Partial Exemptions.** With the exception of the general requirements listed in SMC 20.50.300, the following are exempt from the provisions of this subchapter, provided the development activity does not occur in a critical area or critical area buffer. For those exemptions that refer to size or number, the thresholds are cumulative during a 36-month period for any given parcel:

1. The removal of up to six significant trees (see Chapter 20.20 SMC, Definitions) and associated removal of understory vegetation from any property.
2. Landscape maintenance and alterations on any property that involves the clearing of less than 3,000 square feet, or less than 1,500 square feet if located in a critical drainage area, provided the tree removal threshold listed above is not exceeded. (Ord. 238 Ch. V § 5(C), 2000).

**20.50.320 Specific activities subject to the provisions of this subchapter.**

All activities listed below must comply with the provisions of this subchapter. For those exemptions that refer to size or number, the thresholds are cumulative during a 36-month period for any given parcel:

- A. The construction of new residential, commercial, institutional, or industrial structures or additions.
- B. Earthwork of 50 cubic yards or more. This means any activity which moves 50 cubic yards of earth, whether the material is excavated or filled and whether the material is brought into the site, removed from the site, or moved around on the site.
- C. Clearing of 3,000 square feet of land area or more or 1,500 square feet or more if located in a critical drainage area.
- D. Removal of more than six significant trees from any property.
- E. Any clearing or grading within a critical area or buffer of a critical area.

- F. Any change of the existing grade by four feet or more.
- G. Any work that occurs within or requires the use of a public easement, City-owned tract or City right-of-way.
- H. Any land surface modification not specifically exempted from the provisions of this subchapter.
- I. Construction or creation of new impervious surface over 1,500 square feet in size, or 500 square feet in size if located in a landslide hazard area or critical drainage area.
- J. Any construction of public drainage facilities to be owned or operated by the City.
- K. Any construction involving installation of private storm drainage pipes 12-inch in diameter or larger.
- L. Any modification of, or construction which affects a stormwater quantity or quality control system. (Does not include maintenance or repair to the original condition).
- M. Applicants for forest practice permits (Class IV – general permit) issued by the Washington State Department of Natural Resources (DNR) for the conversion of forested sites to developed sites are also required to obtain a clearing and grading permit. For all other forest practice permits (Class II, III, IV – special permit) issued by DNR for the purpose of commercial timber operations, no development permits will be issued for six years following tree removal. (Ord. 238 Ch. V § 5(D), 2000).

### **20.50.330 Project review and approval.**



A. **Review Criteria.** The Director shall review the application and approve the permit, or approve the permit with conditions; provided, that the application demonstrates compliance with the criteria below.

1. The proposal complies with SMC 20.50.340 through 20.50.370, or has been granted a variance.
2. The proposal complies with all standards and requirements for the underlying permit.
3. If the project is located in a critical area or buffer or has the potential to impact a critical area, the project must comply with the critical areas standards.
4. The project complies with all requirements of the engineering standards and the Surface Water Design Manual.
5. All required bonds or other assurance devices are posted with the City.

B. **Professional Evaluation.** In determining whether a tree removal and/or clearing is to be approved or conditioned, the Director may require the submittal of a professional evaluation and/or a tree protection plan prepared by a certified arborist at the applicant's expense, where the Director deems such services necessary to demonstrate compliance with the standards and guidelines of this subchapter. Third party review of plans, if required, shall also be at the applicant's expense. The Director shall have the sole authority to determine whether the professional evaluation submitted by the applicant is adequate, the evaluator is qualified

and acceptable to the City, and whether third party review of plans is necessary. Required professional evaluation(s) and services may include:

1. Providing a written evaluation of the anticipated effects of proposed construction on the viability of trees on a site;
2. Providing a hazardous tree assessment;
3. Developing plans for, supervising, and/or monitoring implementation of any required tree protection or replacement measures; and/or
4. Conducting a post-construction site inspection and evaluation.

**C. Conditions of Approval.** The Director may specify conditions for work at any stage of the application or project as he/she deems necessary to ensure the proposal's compliance with requirements of this subchapter, critical area standards, engineering standards, the adopted stormwater management regulations, and any other section of the Shoreline Development Code, or to protect public or private property. These conditions may include, but are not limited to hours or seasons within which work may be conducted, or specific work methods.

**D. Designation of Protected Trees.**

1. For the following areas, the retention and planting plan and any application and permit plans shall show all trees designated for protection: areas designated as "protected trees," "native growth protection areas," "sensitive areas," "sensitive area buffers," or such other designation as may be approved

by the Director. Protected vegetation, including protected trees, shall not be modified, harmed or removed except as provided in this subchapter.

2. The Director may require that protected trees be permanently preserved within a tract, easement or other permanent protective mechanism. When required, the location, purpose, and limitation of these protected areas shall be shown on the face of the deed, plat, binding site plan, or similar document and shall be recorded with the King County Department of Records and Elections or its successor. The recorded document shall include the requirement that the protected areas shall not be removed, amended or modified without the written approval of the City.

E. **Preconstruction Meeting Required.** Prior to the commencement of any permitted clearing and grading activity, a preconstruction meeting shall be held on site with the permittee and appropriate City staff. The project site shall be marked in the field as follows:

1. The extent of clearing and grading to occur;
2. Delineation of any critical areas and critical area buffers;
3. Trees to be removed and retained; and
4. Property lines. (Ord. 238 Ch. V § 5(E), 2000).

**20.50.340 Basic operating conditions and standards of performance.**

A. Any activity that will clear, grade or otherwise disturb the site, whether requiring a clearing or grading permit or not, shall provide erosion and

sediment control (ESC) that prevents, to the maximum extent possible, the transport of sediment from the site to drainage facilities, water resources and adjacent properties. Erosion and sediment controls shall be applied as specified by the temporary ESC measures and performance criteria and implementation requirements in the adopted stormwater management design manual.

B. Cuts and fills shall conform to the following provisions unless otherwise approved by the Director:

1. **Slope.** No slope of cut and fill surfaces shall be steeper than is safe for the intended use and shall not exceed two horizontal to one vertical, unless otherwise approved by the Director.

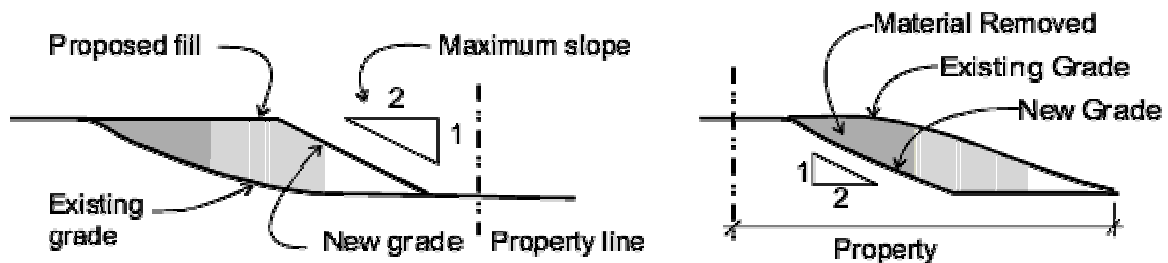


Figure 20.50.340(B): Illustration of fill and cut with maximum slope 2:1.

2. **Erosion Control.** All disturbed areas including faces of cuts and fill slopes shall be prepared and maintained to control erosion in compliance with the Surface Water Design Manual.
3. **preparation of Ground.** The ground surface shall be prepared to receive fill by removing unsuitable material such as concrete slabs, tree stumps, construction materials, brush and other debris.

4. **Fill Material.** Detrimental amounts of organic material shall not be permitted in fills. Only earth materials which have no rock or similar irreducible material with a maximum dimension greater than 12 inches shall be used. In the absence of an approved soils engineering report, these provisions may be waved by the Director for minor fills not intended to support structures.

5. **Drainage.** Provisions shall be made to:

- a. Prevent any surface water or seepage from damaging the cut face of any excavations or the sloping face of a fill;
- b. Carry any surface waters that are or might be concentrated as a result of a fill or excavation to a natural watercourse, or by other means approved by the department of public works;

6. **Bench/Terrace.** Benches, if required, at least 10 feet in width shall be back-sloped and shall be established at not more than 25 feet vertical intervals to control surface drainage and debris. Swales or ditches on benches shall have a maximum gradient of five percent.

7. **Setbacks.** The tops and the toes of cut and fill slopes shall be set back from property boundaries as far as necessary for safety of the adjacent properties and to prevent damage resulting from water runoff or erosion of the slopes. The tops and the toes of cut and fill slopes shall be set back from structures as far as is necessary for adequacy of foundation support and to prevent damage as a result of water runoff

or erosion of the slopes. Slopes and setbacks shall be determined by the Director.

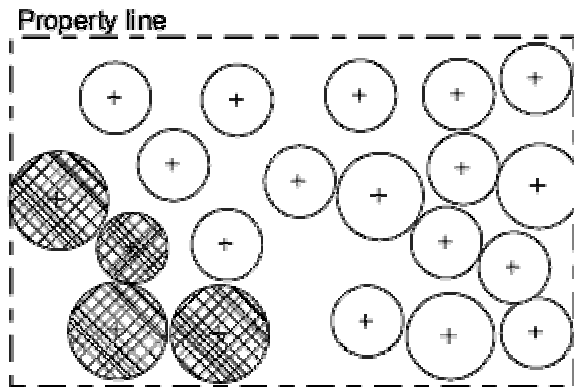
- C. **Access Roads – Maintenance.** Access roads to grading sites shall be maintained and located to the satisfaction of the Director to minimize problems of dust, mud and traffic circulation.
  
- D. **Access Roads – Gate.** Access roads to grading sites shall be controlled by a gate when required by the Director.
  
- E. **Warning Signs.** Signs warning of hazardous conditions, if such exist, shall be affixed at locations as required by the Director.
  
- F. **Temporary Fencing.** Temporary fencing, where required by the Director, to protect life, limb and property, shall be installed. Specific fencing requirements shall be determined by the Director.
  
- G. **Hours of Operation.** Hours of operation for tree cutting, clearing and grading, unless otherwise authorized by the Director, shall be between 7:00 a.m. and 7:00 p.m. weekdays and 9:00 a.m. to 9:00 p.m. on Saturdays and Sundays. Additionally, tree cutting (felling) shall further be limited to daylight hours.
  
- H. **Traffic Control and Haul Plan.** The applicant shall be required to submit a plan detailing traffic control and proposed timing, volume, and routing of trucks and equipment as determined to be necessary by the Director. (Ord. 238 Ch. V § 5(F), 2000).

**20.50.350 Development standards for clearing activities.**

A. No trees or ground cover shall be removed from critical area or buffer unless the proposed activity is consistent with the critical area standards.

B. **Minimum Retention Requirements.** All proposed development activities that are not exempt from the provisions of this subchapter shall meet the following:

1. At least 20 percent of the significant trees on a given site shall be retained, excluding critical areas, and critical area buffers, **or**
2. At least 30 percent of the significant trees on a given site (which may include critical areas and critical area buffers) shall be retained.
3. The Director may require the retention of additional trees to meet the stated purpose and intent of this ordinance, as required by the critical areas standards, or as site-specific conditions demand using SEPA substantive authority.

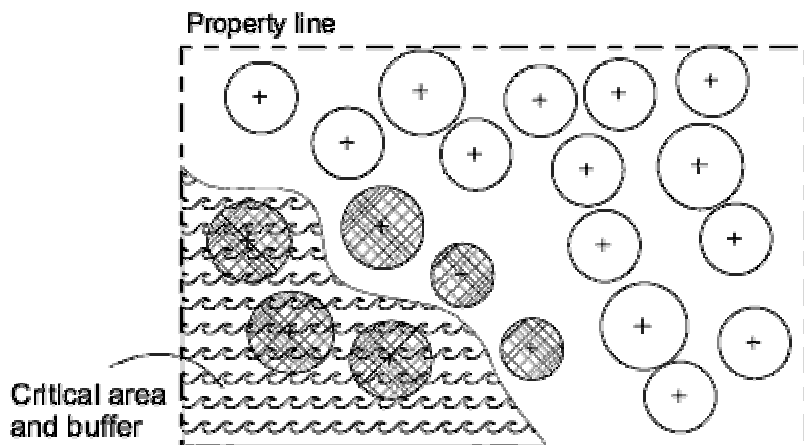


**LEGEND**

 Indicates trees to be retained

**Figure 20.50.350(B)(1): Demonstration of the retention of 20 percent of the significant**

trees on a site containing no critical areas.



**LEGEND**

⊗ Indicates significant trees to be retained

**Figure 20.50.350(B)(2): Demonstration of the retention of 30 percent of the significant trees on a site containing a critical area.**

Exception 20.50.350(B):

- 1. The Director may allow a reduction in the minimum significant tree retention percentage to facilitate preservation of a greater number of smaller trees, a cluster or grove of trees, contiguous perimeter buffers, distinctive skyline features, or based on the City's concurrence with a written recommendation of an arborist certified by the International Society of Arboriculture and approved by the City that retention of the minimum percentage of trees is not advisable on an individual site.*
- 2. In addition, the Director may allow a reduction in the minimum significant tree retention percentage if all of the following criteria are satisfied: The exception is necessary because:*



*There are special circumstances related to the size, shape, topography, location or surroundings of the subject property.*

*Strict compliance with the provisions of this Code may jeopardize reasonable use of property.*

*Proposed vegetation removal, replacement, and any mitigation measures are consistent with the purpose and intent of the regulations.*

*The granting of the exception or standard reduction will not be detrimental to the public welfare or injurious to other property in the vicinity.*

*3. If an exception is granted to this standard, the applicant shall still be required to meet the basic tree replacement standards identified in SMC 20.50.360 for all significant trees removed beyond the six allowed per parcel without replacement and up to the maximum that would ordinarily be allowed under SMC 20.50.350(B).*

*4. In addition, the applicant shall be required to plant four trees for each significant tree removed that would otherwise count towards the minimum retention percentage. Trees replaced under this provision shall be at least 12 feet high for conifers and three inches in caliper if otherwise. This provision may be waived by the Director for restoration enhancement projects conducted under an approved vegetation management plan.*

**C. Incentives for Higher Levels of Tree Protection.** The Director may grant reductions or adjustments to other site development standards if the protection levels identified in subsection (B) of this section above are exceeded. On a case by case review, the Director shall determine the balance between tree protection that exceeds the established minimum percentage and variations to site development requirements. If the Director

grants adjustments or reductions to site development standards under this provision, then tree protection requirements shall be recorded on the face of the plat, as a notice to title, or on some other legal document that runs with the property. Adjustments that may be considered are:

1. Reductions or variations of the area, width, or composition of required open space and/or landscaping;
2. Variations in parking lot design and/or and access driveway requirements;
3. Variations in building setback requirements;
4. Variations of grading and stormwater requirements.

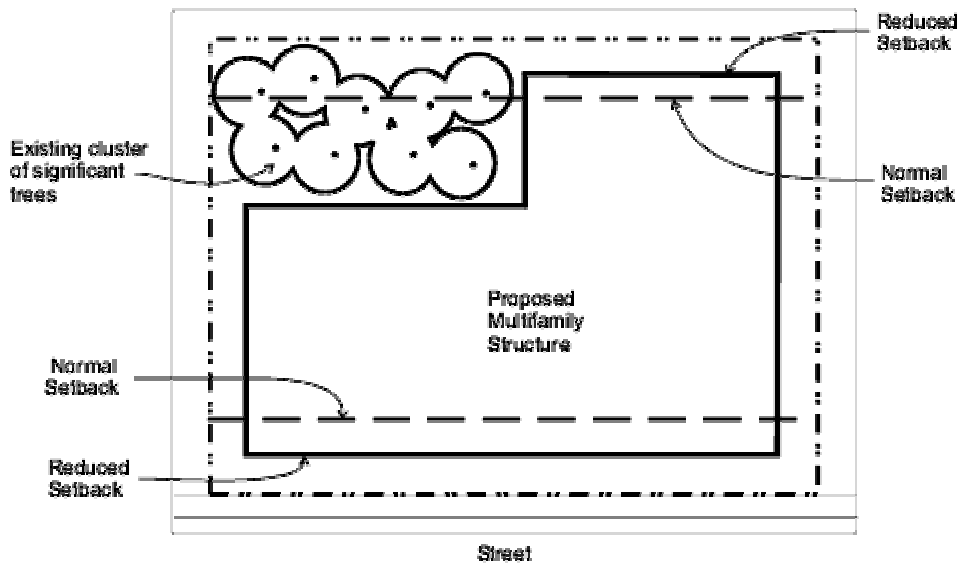


Figure 20.50.350(C): Example of aggregate setback to preserve a cluster of significant trees.

**D. Site Design.** Site improvements shall be designed and constructed to meet the following:

1. Trees should be protected within vegetated islands and stands rather than as individual, isolated trees scattered throughout the site.
2. Site improvements shall be designed to give priority to protection of trees with the following characteristics, functions, or location:

Existing stands of healthy trees that have a reasonable chance of survival once the site is developed, are well shaped to withstand the wind and maintain stability over the long term, and will not pose a threat to life or property;

Trees which exceed 50 feet in height.

Trees and tree clusters which form a continuous canopy.

Trees that create a distinctive skyline feature.

Trees that have a screening function or provide relief from glare, blight, commercial or industrial harshness;

Trees providing habitat value, particularly riparian habitat;

Trees within the required yard setbacks or around the perimeter of the proposed development;

Trees having a significant land stability function;

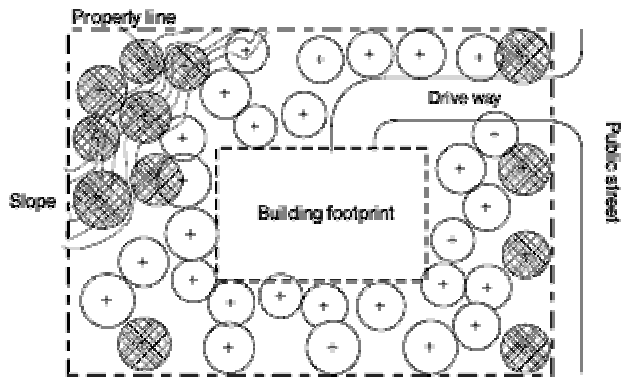
Trees adjacent to public parks, open space, and sensitive area buffers.

Trees having a significant water-retention function, such as cottonwoods.



3. Building footprints, parking areas, roadways, utility corridors and other structures shall be designed and located with a consideration of tree protection opportunities.
4. The project grading plans shall accommodate existing trees and avoid alteration to grades around existing significant trees to be retained.

5. Required open space and recreational space shall be designed and located to protect existing stands of trees.
6. The site design and landscape plans shall provide suitable locations and adequate area for replacement trees as required in SMC 20.50.370.
7. In considering trees for protection, the applicant shall avoid selecting trees that may become hazardous because of wind gusts, including trees adjacent to utility corridors where falling trees may cause power outages or other damage. Remaining trees may be susceptible to blow downs because of loss of a buffer from other trees, grade changes affecting the tree health and stability and/or the presence of buildings in close proximity.
8. If significant trees have been removed from a closed, forested situation, an adequate buffer of smaller trees shall be retained or planted on the fringe of such significant trees as determined by a certified arborist.
9. All trees located outside of identified building footprints and driveways and at least 10 feet from proposed structures shall be considered as eligible for preservation. However, all significant trees on a site shall be considered when calculating the minimum retention percentage.

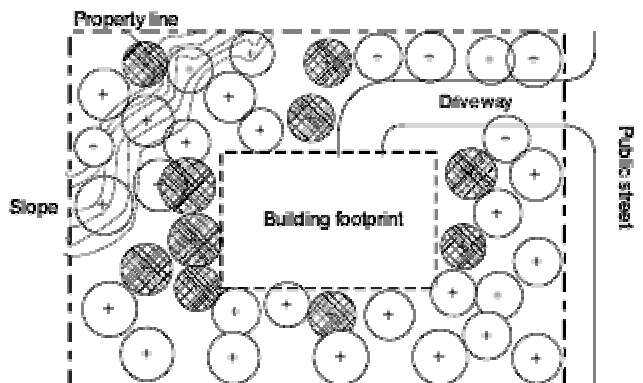
## DO THIS



### LEGEND

-  Appropriately retained trees - in clusters on a slope and along the street
-  Trees proposed for removal

## DON'T DO THIS



### LEGEND

-  Inappropriately retained trees - too close to the building and/or scattered single trees
-  Trees proposed for removal

**Figure 20.50.350(D):** Example of the application of tree retention site design standards. Appropriate retention of a cluster of trees on a slope and frontage trees are shown above. Inappropriate retention of scattered single trees and trees near structures are shown below.

E. **Cutting and Pruning of Protected Trees.** Trees protected under the provisions of this section shall not be topped. Pruning and maintenance of protected trees shall be consistent with best management practices in the field of arboriculture and further the long-term health of the tree. Excessive pruning, including topping, stripping, or imbalances, shall not be allowed unless necessary to protect life and property.

The last sentence is expanded to make the term “excessive pruning” clearer.

F. **Landmark Trees.** Trees which have been designated as landmark trees by the City of Shoreline because they are 30 inches or larger in diameter or particularly impressive or unusual due to species, size, shape, age, historical significance and/or is an outstanding row or group of trees, has become a landmark to the City of Shoreline or is considered a specimen of its species shall not be removed unless the applicant meets the exception requirements of subsection (B) of this section. The Director shall establish criteria and procedures for the designation of landmark trees. (Ord. 238 Ch. V § 5(G), 2000).

**20.50.360 Tree replacement and site restoration.**

A. **Plans Required.** Prior to any tree removal, the applicant shall demonstrate through a clearing and grading plan, tree retention and planting plan, landscape plan, critical area protection and mitigation plan, or other plans acceptable to the Director that tree replacement will meet the minimum standards of this section. Plans shall be prepared by a qualified person or persons at the applicant’s expense. Third party review of plans, if required, shall be at the applicant’s expense.

B. The City may require the applicant to relocate or replace trees, shrubs, and ground covers, provide erosion control methods, hydro seed exposed slopes, or otherwise protect and restore the site as determined by the Director or designee.

**C. Replacement Required.** Up to six significant trees and associated vegetation may be removed per parcel with no replacement of trees required. Any significant tree proposed for removal beyond this limit should be replaced as follows:

1. One existing significant tree of eight inches in diameter at breast height for conifers or 12 inches in diameter at breast height for all others equals one new tree.
2. Each additional three inches in diameter at breast height equals one additional new tree, up to three trees per significant tree removed.
3. Minimum size requirements for trees replaced under this provision: deciduous trees shall be at least 1.5 inches in caliper and evergreens six feet in height.

Exception 20.50.360(C):

1. *No tree replacement is required in the following cases: when*  
~~*The tree is hazardous, dead, diseased, injured or in a declining condition with no reasonable assurance of remaining vigor.*~~  
*The tree is proposed for relocation to another suitable planting site; provided, that relocation complies with the standards of this section.*
2. *The Director may allow a reduction in the minimum replacement trees required or off-site planting of replacement trees if all of the following criteria are satisfied:*  
*There are special circumstances related to the size, shape, topography, location or surroundings of the subject property.*  
*Strict compliance with the provisions of this Code may jeopardize reasonable use of property.*

The tree replacement exception for hazardous trees is removed so that replanting would be required. The general provisions allowing up to six trees (hazardous or not) to be removed without replacement would continue to apply.

*Proposed vegetation removal, replacement, and any mitigation measures are consistent with the purpose and intent of the regulations.*

*The granting of the exception or standard reduction will not be detrimental to the public welfare or injurious to other property in the vicinity.*

*3. The Director may waive this provision for site restoration or enhancement projects conducted under an approved vegetation management plan.*

- D. The Director may require that a portion of the replacement trees be native species in order to restore or enhance the site to predevelopment character.
- E. The condition of replacement trees shall meet or exceed current American Nursery and Landscape Association or equivalent organization's standards for nursery stock.
- F. Replacement of removed trees with appropriate native trees at a ratio determined by the Director will be required in critical areas.
- G. The Director may consider smaller-sized replacement plants if the applicant can demonstrate that smaller plants are more suited to the species, site conditions, and to the purposes of this subchapter, and are planted in sufficient quantities to meet the intent of this subchapter.
- H. All required replacement trees and relocated trees shown on an approved permit shall be maintained in healthy condition by the property owner throughout the life of the project, unless otherwise approved by the Director in a subsequent permit.



- I. Where development activity has occurred that does not comply with the requirements of this subchapter, the requirements of any other section of the Shoreline Development Code, or approved permit conditions, the Director may require the site to be restored to as near preproject original condition as possible. Such restoration shall be determined by the Director and may include, but shall not be limited to, the following:
1. Filling, stabilizing and landscaping with vegetation similar to that which was removed, cut or filled;
  2. Planting and maintenance of trees of a size and number that will reasonably assure survival and that replace functions and values of removed trees; and
  3. Reseeding and landscaping with vegetation similar to that which was removed, in areas without significant trees where bare ground exists.
- J. Significant trees which would otherwise be retained, but which were unlawfully removed or damaged or destroyed through some fault of the applicant or their representatives shall be replaced in a manner determined by the Director.
- K. **Performance Assurance.** A performance bond or other acceptable security device to ensure the installation, maintenance and adequate performance of tree retention, replacement, and protection measures may be required in an amount determined by the Director.
- L. **Monitoring.** The Director may require submittal of periodic monitoring reports as necessary to ensure survival of replacement trees. The

contents of the monitoring report shall be determined by the Director.

**M. Discovery of Undocumented Critical Areas.**

The Director may stop work authorized by a clearing and grading permit if previously undocumented critical areas are discovered on the site. The Director has the authority to require additional studies, plans and mitigations should previously undocumented critical areas be found on a site. (Ord. 299 § 1, 2002; Ord. 238 Ch. V § 5(H), 2000).

**20.50.370 Tree protection standards.**

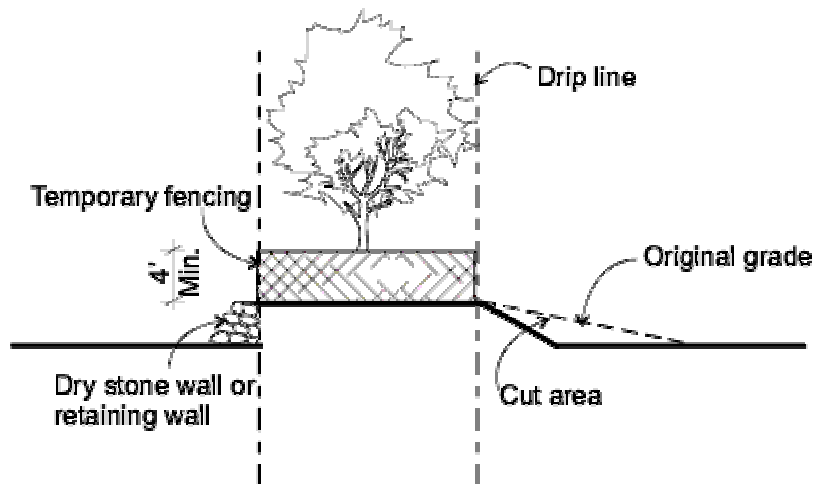
The following protection measure shall be imposed for all trees to be retained on-site during the construction process.

- A. All required tree protection measures shall be shown on the tree protection and replacement plan, clearing and grading plan, or other plan submitted to meet the requirements of this subchapter.
- B. Tree dripline areas shall be protected. No fill, excavation, construction materials, or equipment staging or traffic shall be allowed in the dripline areas of trees that are to be retained.
- C. Prior to any land disturbance, temporary construction fences must be placed around the dripline of trees to be preserved. If a cluster of trees is proposed for retention the barrier shall be placed around the edge formed by the drip lines of the trees to be retained.
- D. Tree protection barriers shall be a minimum of four feet high, constructed of chain link, or polyethylene laminar safety fencing or similar material, subject to approval by the Director. "Tree Protection Area" signs shall be posted visibly on all sides of the fenced areas. On large

or multiple-project sites, the Director may also require that signs requesting subcontractor cooperation and compliance with tree protection standards be posted at site entrances.

- E. Where tree protection areas are remote from areas of land disturbance, and where approved by the Director, alternative forms of tree protection may be used in lieu of tree protection barriers; provided, that protected trees are completely surrounded with continuous rope or flagging and are accompanied by “Tree Leave Area – Keep Out” signs.
  
- F. Rock walls shall be constructed around the tree, equal to the dripline, when existing grade levels are lowered or raised by the proposed grading.
  
- G. Retain small trees, bushes and understory plants within the tree protection zone to the maximum extent practicable.
  
- H. **Preventative Measures.** In addition to the above minimum tree protection measures, the applicant should support tree protection efforts by employing, as appropriate, the following preventative measures, consistent with best management practices for maintaining the health of the tree:
  - 1. Pruning of visible deadwood on trees to be protected or relocated;
  
  - 2. Application of fertilizer to enhance the vigor of stressed trees;
  
  - 3. Use of soil amendments and soil aeration in tree protection and planting areas;
  
  - 4. Mulching over tree drip line areas; and

5. Ensuring proper watering during and immediately after construction and throughout the first growing season after construction.



**Figure 20.50.370:**  
**Illustration of standard techniques used to protect trees during construction.**

**Exception 20.50.370:**

*The Director may waive certain protection requirements, allow alternative methods, or require additional protection measures based on concurrence with the recommendation of a certified arborist deemed acceptable to the City. (Ord. 238 Ch. V § 5(l), 2000).*

# ATTACHMENT IV

OCTOBER 2003

**DRAFT**

**TECHNICAL MEMORANDUM:**

**SELECTED SUMMARY OF  
BEST AVAILABLE SCIENCE  
IN SUPPORT OF CITY OF SHORELINE  
CRITICAL AREAS UPDATE**

*Prepared for:*

**Berryman & Henigar**

*Prepared by:*

**Adolfson Associates, Inc.  
5309 Shilshole Avenue NW, Suite 200  
Seattle, Washington 98107**

# CONTENTS

1	<u>INTRODUCTION</u> .....	1
1.1	<u>Project Authorization</u> .....	1
1.2	<u>Overview of Growth Management Act Requirements</u> .....	1
2	<u>STREAMS AND RIPARIAN AREAS</u> .....	2
2.1	<u>Importance of Streams and Riparian Areas</u> .....	2
2.2	<u>Functions of Streams</u> .....	2
2.3	<u>Function of Riparian Buffers</u> .....	2
2.4	<u>Stream Management in Urban Environments</u> .....	3
2.5	<u>Fisheries Habitat and Salmonid Use in the City of Shoreline</u> .....	4
2.6	<u>Functions of Streams and Riparian Areas in the City of Shoreline</u> .....	5
2.7	<u>Data Gaps</u> .....	5
3	<u>WETLANDS AND WETLAND BUFFERS</u> .....	5
3.1	<u>Wetland Definition</u> .....	6
3.2	<u>Wetland Functions and Values</u> .....	6
3.3	<u>Functions and Values of Wetland Buffers</u> .....	7
3.3.1	<u>Wetland and Buffer Mitigation Success</u> .....	8
3.3.2	<u>Mitigation Ratios</u> .....	10
3.4	<u>Functions and Values of Wetlands and Wetland Buffers in the City of Shoreline</u> .....	10
3.5	<u>Data Gaps</u> .....	10
4	<u>MARINE/NEARSHORE AREAS</u> .....	11
4.1	<u>Importance of Marine/Nearshore Areas</u> .....	11
4.2	<u>Marine/Nearshore Areas in the City of Shoreline</u> .....	11
4.3	<u>Functions of Nearshore Zones</u> .....	11
4.3.1	<u>Wetlands</u> .....	12
4.3.2	<u>Marine Riparian Zones</u> .....	12
4.3.3	<u>Banks and Bluffs</u> .....	12
4.3.4	<u>Beaches and Backshore</u> .....	12
4.3.5	<u>Flats</u> .....	13
4.3.6	<u>Eelgrass Meadows</u> .....	13
4.3.7	<u>Kelp Forests</u> .....	13
5	<u>REFERENCES</u> .....	14
5.1	<u>Cited References</u> .....	14
5.2	<u>Other References</u> .....	18
5.3	<u>Web Sites</u> .....	23

# 1 INTRODUCTION

## 1.1 Project Authorization

At the request of the City of Shoreline, Adolfson Associates, Inc. (Adolfson) has prepared this technical memorandum to provide guidance to the City as they develop the “best available science” record for the update of their critical areas ordinance. Adolfson focused on providing a brief summary of scientific information related to managing the City’s stream, wetland, wildlife, and marine/nearshore resources.

This technical memorandum summarizes the findings of a brief review of selected scientific documents and evaluates the applicability of the science to the City’s critical areas. This review includes relevant studies from the Office of Community Development’s “Citations of Recommended Sources for Designating and Protecting Critical Areas,” as well as other selected sources. This review was limited by the available scope and budget authorized for this task. Additional scientific information, not reviewed under this scope of work, may be relevant to the City’s critical areas. No field visits were conducted as a part of the development of this technical memorandum.

## 1.2 Overview of Growth Management Act Requirements

Under the 1990 Growth Management Act (GMA) (RCW 360.70A.060), counties and cities are required to adopt development regulations that protect the functions and values of critical areas including, but not limited to, streams, wetlands, and wildlife habitat. In 1995, the Washington State legislature added a new section to the GMA to ensure that counties and cities consider reliable scientific information when adopting policies and development regulations to designate and protect critical areas. RCW 36.70A.172(1) states:

*In designating and protecting critical areas under this chapter, counties and cities shall include the best available science in developing policies and development regulations to protect the functions and values of critical areas.*

In addition, RCW 36.70A.172(1) states that special consideration must be given to “measures necessary to preserve or enhance anadromous fisheries,” which refers to those species that reproduce in fresh water and migrate to salt water for some portion of their life, returning to fresh water. The term “fisheries” commonly refers to stocks of fish that are managed for commercial, recreational, cultural, or ceremonial uses (WDFW, 1997).

In response to this legislation, the State Office of Community, Trade, and Economic Development (CTED) promulgated rules to guide cities and counties in identifying and including the best available science in their critical area policies and regulations. These rules are found under WAC 365-195-900-925.



## **2 STREAMS AND RIPARIAN AREAS**

### **2.1 Importance of Streams and Riparian Areas**

Stream systems are one of the most productive natural ecosystems. Riparian areas play a significant role in the protection of the functions of adjacent aquatic habitats. Both streams and their riparian areas provide important habitats for aquatic species and other wildlife, as well as contribute to recreation, water supply, economic, and cultural and historic values. Specific stream functions are discussed in the following section.

### **2.2 Functions of Streams**

Elements necessary for healthy salmonid populations and for populations of other aquatic organisms rely on processes sustained by the dynamic interaction between the streams and their adjacent riparian areas (Naiman et al., 1992). Stream and riparian area functions include:

- Maintaining stream baseflows;
- Maintaining water quality;
- Providing in-stream structural diversity; and
- Providing biotic input of insects and organic matter.

### **2.3 Function of Riparian Buffers**

Riparian buffers along stream banks help to mitigate the impacts of urbanization and disturbance on adjacent lands (Finkenbine et al., 2000 in Bolton and Shellberg, 2001). Knutson and Naef (1997) summarize many of the functions of riparian buffers for Washington. The Washington Department of Fish and Wildlife's (WDFW) recommended standard buffer widths previously released in the Office of Community Development's Model Critical Areas Code for the state's five-tier stream typing system were based on this latter research (Table 1) (OCD, 2002). The model code is currently being revised.

Buffer widths reported to be effective for riparian functions vary considerably by function; the literature is not definitive in identifying one buffer width for each function studied (Williams and Lavey, 1986; Johnson and Ryba, 1992). The wide range of reported effective buffer widths indicates that site-specific factors such as climate, slope, aspect, and land use are also important in determining the outcome of each study. However, a general relationship between buffer width and buffer effectiveness can be found in reviews of previous studies on buffers. Studies indicate that buffers 100 to 150 feet (30 to 45 meters) wide provide most (on the order of 80 percent) of the potential functions. In general, larger buffer widths tend to be most closely correlated with wildlife habitat functions; findings from previous studies range in some cases up to 600 feet for larger mammals and birds (Jones et al., 1988). There is also little research

specifically on effectiveness of riparian buffers in urban environments (Herson-Jones et al., 1995). Buffer distances can be viewed mainly as guidelines, as the literature shows that site-specific factors, including buffer quality, may impact buffer effectiveness along with buffer width (Naiman et al., 1992; Castelle et al., 1994).

**Table 1. Riparian Habitat Area Buffer Recommendations:  
Washington Department of Fish and Wildlife**

<b>Stream Type</b>	<b>Recommended Riparian Width</b>
Type 1 & 2, shorelines of statewide significance	250 feet
Type 3 or other perennial or fish bearing streams, 5-20 feet wide	200 feet
Type 3 or other perennial or fish bearing streams, less than 5 feet wide	150 feet
Type 4 and 5 (low mass wasting potential)	150 feet
Type 4 and 5 (high mass wasting potential)	225 feet

Source: OCD, 2002; For definitions of the stream types see the Washington Administrative Code Sections 222-16-030 and 031.

## **2.4 Stream Management in Urban Environments**

Some recent studies have focused on the general effects of urbanization on streams in the lowland Puget Sound region (Booth, 2000; Horner and May, 1999). In these studies, a general trend has emerged that places a greater emphasis on evaluation of buffer effectiveness in the context of watershed processes and landscape-level alterations to watersheds (Roni et al., 2002; Richards et al., 1996).

The loss or disturbance of native riparian area is closely tied to urbanization in a watershed (Horner and May, 1999; Leavitt, 1998). However, water quality and the amount of impervious area have also been associated with stream degradation and impacts to native riparian areas. The adverse impacts of impervious area and water quality functions, which can include alteration of stream hydrology and degradation of water quality, are compounded by degradation of riparian areas (Bledsoe and Watson, 2001; May et al., 1997a).

Land uses, such as high-density residential development or commercial development, located adjacent to riparian areas can result in greater impacts than lower density single-family residential uses because of factors such as greater impervious surface and greater potential for human intrusion into the buffer (Pitt et al., 1986). In most urban areas, prescriptive buffers may not be adequate to maintain stream or riparian functions because most of the functions of buffers have been compromised by past land use actions. For example, protection or restoration of the natural large woody debris recruitment function of riparian areas is difficult in areas that lack mature forested streamside vegetation (Larson, 2000). Watershed-based strategies that address hydrology and water quality in addition to riparian area width and quality may also be helpful to successfully address management of streams (Booth, 2000; Horner and May, 1999). When applied in the

context of a basin-wide change, these strategies, which may include stormwater management and land use controls, may most effectively address protection, enhancement, and restoration of stream systems.

Barriers like culverts and stormwater control structures can inhibit fish migration and prohibit fish from accessing upstream habitats. Barriers that do not prevent the migration of fish may limit many natural processes necessary for salmonid fish production including the natural redistribution of substrate and woody debris. Restoring fish passage is an effective way to increase the quality and accessibility of habitat and can result in relatively large increases in potential fish production at a nominal cost (Roni et al., 2002). Stream channels with high quality habitat (low gradient, high pool frequency, high woody debris recruitment from riparian areas) produce greater benefits (Roni et al., 2002). Land use actions or incentives that address such issues can help conserve and enhance stream functions necessary to maintain and restore populations of anadromous fish.

In urban settings where individual functions and elements of stream habitat are not optimal for salmonids, the combined effect of conditions in a stream basin may allow salmonids to successfully use its habitats. The combined effects of the individual processes that form and support habitat, such as input of organic material and substrate types, may be sufficient to allow some salmonids to live and reproduce. In addition, small changes in stream function (e.g., improving habitat access by removing a fish-passage barrier), in combination with watershed-based restoration strategies, may provide substantial benefits to salmonid populations in urbanized basins.

## 2.5 Fisheries Habitat and Salmonid Use in the City of Shoreline

The City of Shoreline contains two streams that have documented salmonid use. Another stream has documented anadromous salmonid use, but that documentation is for reaches outside the city limits. Much of this information comes from a series of draft stream basin inventories completed by the City in 2003 (Tetra Tech/KCM, 2003a, b, c, and d). The City contains many small watercourses that are remnant portions of previously existing natural drainage systems that likely contain cutthroat trout. No substantial information exists as to the presence or absence of fish within these smaller drainages.

In general, the geographic location, topography, geology, and level of existing urbanization in the City of Shoreline limit the extent to which its streams can provide the necessary biological requirements for salmonid species and other aquatic organisms.

Boeing Creek has documented salmonid use including Chinook salmon (*Oncorhynchus tshawytscha*), a listed Federal Threatened species; chum salmon (*O. keta*); coho salmon, also a listed Federal Candidate species, (*O. kisutch*); and sea run cutthroat trout (*Salmo clarki*).

McAler Creek has documented anadromous salmonid use including Chinook salmon (LFPSF), coho salmon, and sockeye salmon (*O. nerka*) (Tetra Tech/KCM, 2003d). Most use occurs outside the city limits, but coho salmon and resident cutthroat trout have been observed in portions of McAler Creek within the city limits.

Chinook salmon, coho salmon, and sockeye salmon have been documented in Thornton Creek outside of the city limits (WDFW 1998). Resident cutthroat trout are common throughout the Thornton Creek system (Tetra Tech/KCM, 2003d).

Many of the City's smaller streams are likely to contain resident cutthroat trout.

## **2.6 Functions of Streams and Riparian Areas in the City of Shoreline**

The City of Shoreline is in the process of updating their stream inventory. In this inventory, streams are mapped and evaluated as to their ability to perform basic stream functions such as contributing to stream baseflow, water quality improvement, and providing in-stream habitat and structure. Preliminary stream habitat assessments (Tetra Tech/KCM, 2003a, b, and d) rate the stream habitat conditions in the City's streams as poor to fair.

## **2.7 Data Gaps**

Two data gaps were discovered in the preparation of this study. The first is the lack of best available science literature specifically pertaining to urbanizing watersheds and the buffers needed to protect environmentally sensitive areas in the central Puget Sound area specifically, and in the urban Pacific Northwest in general. The second data gap is the lack of information on some aspects of the City's streams and their associated riparian habitat. A draft stream inventory has been prepared for the City that evaluates the streams in the city limits, and is a good start in the assessment of stream conditions, providing information beyond many other jurisdictions in the region. In addition to the stream inventory currently being prepared by the City, an assessment of fish and wildlife use in the City's streams and riparian corridors will be useful in making policy decisions and modifications regarding sensitive areas. In addition, documentation of water quality parameters and buffer quality could be included as part of this background documentation.

## **3 WETLANDS AND WETLAND BUFFERS**

This section briefly summarizes some of the pertinent scientific literature for wetlands and wetland buffers. This section also builds on the existing information regarding wetlands in the City by summarizing additional sources pertaining to wetland functions and values.

Wetlands and their buffers provide important functions and values for both the human and biological environment. These functions include control of hydrology, improvement of water quality, contribution to stream base flow and groundwater recharge, production of nutrients, and provision of wildlife habitat. These functions are discussed in more detail below.

Wetlands are also valued for social and economic values, including their recreational and educational value, and the role they play in mitigating flooding and its associated health and safety concerns.

### 3.1 Wetland Definition

Wetlands are formally defined by the U.S. Army Corps of Engineers (Corps), the Environmental Protection Agency (EPA), the Washington Shoreline Management Act (SMA) (1971) and the Washington State Growth Management Act (GMA) (1992) as:

*... those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (Federal Register, 1982, 1986).*

In addition, the Washington Shoreline Management Act definition and the GMA definition add:

*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 artificially created wetlands intentionally created from non-wetland areas to mitigate the conversion of wetlands.*

This same definition of wetland is used in the Washington State Wetlands Identification and Delineation Manual (Ecology, 1997).

Wetlands are typically rated based on size and habitat, and on their relative functions and values. In the State of Washington, the Department of Ecology (Ecology) has developed a wetland rating system for ranking wetlands according to their relative importance. This rating system is outlined in the *Washington State Wetland Rating System for Western Washington* (Publication No. 93-74, Ecology, 1991). Ecology is currently re-evaluating the wetland rating system for western Washington and will be updating this system in the near future.

### 3.2 Wetland Functions and Values

Wetlands are integral parts of the natural landscape. Their “functions and values” to both the environment and to the general public depend on several elements including their size and location within a basin, as well as their diversity and quality. While each wetland provides various beneficial functions, not all wetlands perform all functions, nor do they perform all functions equally well (Novitski et al., 1995).

Several studies have found that wetland functions and values are compromised by urbanization (Azous and Horner, 2001; Mitsch and Gosselink, 2000; Castelle et al., 1992a; May et al., 1997a; Booth, 2000; City of Portland, 2001). In urban settings individual functions of wetlands may not be optimal. For example, wetlands can provide significant stormwater control, even if they are degraded and comprise only a small percentage of area within a basin. Also, wetlands are important elements of stream systems and fish habitat. Within the urban environment, even degraded wetlands can provide rearing and refuge habitat for fish and other wildlife, along with other benefits that help keep streams healthy.

The functions provided by wetlands and their assigned human-based values have been identified and evaluated through several studies (Cowardin et al., 1979; Adamus et al., 1987; Mitsch and Gosselink, 2000; Hruby, 1995; Reppert et al., 1979; Cooke, 1995.). These functions include:

- Flood water attenuation and flood peak desynchronization;
- Stream base flow maintenance and groundwater support;
- Shoreline protection;
- Water quality improvement;
- Biological support and wildlife habitat; and
- Recreation, education, and open space.

### **3.3 Functions and Values of Wetland Buffers**

Wetland buffers are vegetated upland areas immediately adjacent to wetlands. These areas provide beneficial functions that enhance and protect the many functions and values of wetlands described above. Buffers are particularly important for wildlife because many of the wildlife species associated with wetlands also require terrestrial habitats for their survival. Terrestrial habitats surrounding wetlands also provide a buffer to help mitigate the impacts of urbanization such as runoff from impervious surfaces and human intrusion.

Buffer areas retain sediments, nutrients, pesticides, pathogens, and other pollutants that may be present in runoff (Ecology, 1996). Reduction of sediment and pollutant discharge to wetlands can reduce or prevent alterations to plant and animal communities and degradation of water quality. As a result, buffers also increase the ability of wetlands to further provide sediment and pollutant removal. Upland buffers can infiltrate floodwater, reducing the effects of water level fluctuations in wetlands. Buffers composed of forested and shrub vegetation provide shade and can help maintain water and wildlife habitat quality.

Several literature reviews have been published summarizing the effectiveness of various buffer widths, mainly for riparian areas, but also for wetlands (Castelle et al., 1992a; Castelle and Johnson, 2000; Desbonnet et al., 1994; FEMAT, 1993). Some literature sources indicate that buffer widths beneficial for protecting a given function or group of

functions depend on numerous site-specific factors. These factors include the plant community (species, density, and age), aspect, slope, and soil type, as well as adjacent land use. The body of science also indicates that the appropriate buffer width for a given wetland is specific to the functions to be achieved by that buffer.

Studies of buffers in forest practices and agriculture indicate that buffers ranging from 25 to 100 feet may be adequate to preserve some of the individual beneficial functions of wetlands. When looking at aggregates of wetland functions, other studies indicate that buffers ranging from 100 to 150 feet wide provide most (on the order of 80 percent) of potential functions in most situations.

In some cases, buffers of 200 or 300 feet or more from the aquatic resource have been documented as more appropriate for some wildlife species. Wildlife species that use wetlands for a portion of their life cycle also depend on terrestrial habitats for food, cover, nesting, and/or travel corridors. A variety of wildlife species utilize the edge habitat between wetlands and uplands habitat. Terrestrial habitat areas provide a source of large woody debris used by wildlife for foraging, nesting, and cover (O'Connell, 2000). Buffers also provide separation between wetland habitat and human disturbance. This distance improves the quality of wildlife habitat by lessening the effects of noise, light, and human motion/activity on animal species sensitive to these disturbances.

There are many different variables affecting wetland functions in urban areas, and applying prescriptive buffer standards alone may not be adequate to protect wetland systems. Due to the type and degree of cumulative impacts to urban wetlands (and streams) that have already occurred as a result of high levels of total impervious area and past disturbance to wetlands, it may also be necessary to develop strategies, such as stormwater management, to protect wetlands in the context of basin-wide change (Booth, 2000; Azous and Horner, 2001; Booth and Reinelt, 1993).

### **3.3.1 Wetland and Buffer Mitigation Success**

The Clean Water Act Section 404(b)(1) Guidelines for wetland mitigation require “no net loss” of wetlands by first avoiding, minimizing, rectifying, and reducing impacts to wetlands and their functions. Where impacts cannot be avoided, mitigation may be required. Most wetland mitigation projects in Washington have not been successful for various reasons and have resulted in lost acreage, wetland types, and wetland functions (Castelle et al., 1992b; Washington Department of Ecology, 2001; Mockler et al., 1998). An initial study by Ecology (Castelle et al., 1992b) reported that 50 percent or more of the mitigation projects studied did not meet permit requirements. Common problems included:

- Inadequate design;
- Failure to implement the design;
- Lack of proper maintenance, site infestation by exotic species;
- Grazing by geese or other animals;

- Destruction by floods, erosion, fires, or other catastrophic events;
- Failure to maintain water levels and failure to protect projects from on-site and off-site impacts such as sediment and pollutant loading; and
- Off-road vehicles.

Twenty-four mitigation sites in Washington were analyzed by Ecology and found that although mitigation success has improved in the last 10 years, there is still much room for improvement. The Ecology (2001) study had the following findings:

- Only 29 percent of the projects were achieving all their specified measures;
- Only 84 percent of the total acreage of mitigation was actually established;
- Only 65 percent of the total acreage of lost wetlands was replaced with new wetlands;
- 54 percent of the projects were found to be minimally successful or not successful;
- Wetland enhancement as a type of mitigation performed poorly, compared to creation (50 percent of enhancement sites provided minimal or no contribution to overall wetland functions; 75 percent of sites provided minimal or no contribution to general habitat function); and
- 60 percent of created wetlands were moderately or fully successful and provided significant contribution to water quality and quantity functions.

Ecology (2001) concluded that although better site selection, design and performance standards will help to improve wetland mitigation, consistent follow-up and adaptive management, both to correct problems with current projects and to provide feedback for decision-making on future projects, will result in the greatest overall improvement. Most successful projects had long-term monitoring of at least five years and applied adaptive management strategies. The literature is conflicting on whether on-site mitigation or off-site mitigation can adequately compensate for loss of wetlands and their functions (Erwin, 1990; Castelle et al., 1992a; Kusler, 1992).

Buffer mitigation projects generally are affected by the same factors as wetland mitigation. Success of plant growth in wetland buffers depends on water, nutrient and soil requirements for plants, and controlling the invasion of non-native species (Gwin et al., 1999; Magee et al., 1999). Success of buffer mitigation projects also depends on minimizing human disturbance in the buffer. Buffers in some urban environments, due to close proximity to development, have been altered through dumping of debris, clearing, conversions to residential lawns, and other human disturbances (Desbonnet et al., 1994; Cooke, 1992, Castelle et al., 1992a). However, impacts to buffer areas were less likely in areas where residents had been educated about the value of buffers (Gwin et al., 1999; Kentula, 2002).



### 3.3.2 Mitigation Ratios

Generally, wetland mitigation is implemented over a larger area than the wetland area adversely affected by a proposed project. Mitigation ratios are typically greater than 1:1 for several reasons, some of which are based on science and others which are policy-driven. Higher ratios act as disincentives to fill wetlands. They also provide an opportunity to achieve certain functions over a larger area, thus compensating for a temporal loss of function from the smaller but presumably more mature impact site. In addition, larger replacement ratios compensate for the inability to achieve full replacement acreage of lost wetlands (Washington Department of Ecology, 2001; Kusler and Kentula, 1990).

Mitigation ratios for wetlands in most local jurisdictions in western Washington currently range between 1:1 and 4:1. However, more information is needed to understand whether lost wetland functions and acreage can be entirely compensated. The previously released Draft OCD Model Critical Areas Ordinance (2002) recommends the following wetland mitigation ratios using Ecology's wetland classification scheme, which is also currently being revised:

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

### 3.4 Functions and Values of Wetlands and Wetland Buffers in the City of Shoreline

The City of Shoreline is currently in the process of completing inventories of wetlands in its city limits. Further assessment of this data would be beneficial prior to assessing wetland, and in particular wetland buffer functions and values.

The geographic location, topography, geology, and level of existing urbanization in the City of Shoreline limit the extent to which its wetlands can provide the functions described above. However, even in urban settings where individual functions of wetlands are minimal, the combined functions of the wetland systems may provide many of the functional benefits (e.g., stormwater control) not provided by individual wetlands.

### 3.5 Data Gaps

Two data gaps were discovered in the preparation of this study: the lack of detailed information on the City's wetlands (including wetland functional assessments), and a lack of information on the quality of riparian habitats, and the use of these habitats by wildlife.

## **4 MARINE/NEARSHORE AREAS**

This section briefly summarizes a review of selected relevant science related to marine/nearshore areas adjacent to the City of Shoreline. Three primary sources were utilized to summarize science issues in the nearshore environment for the City including: *Reconnaissance Assessment of the State of the Nearshore Report: Including Vashon and Maury Islands (WRIAs 8 and 9)* (King County DNR, 2001); the Washington Department of Natural Resources (DNR) Shorezone Inventory (WDNR, 2001); and the *King County Nearshore Habitat Mapping Data Report: Picnic Point to Shilshole Marina* (Woodruff et al., 2001).

### **4.1 Importance of Marine/Nearshore Areas**

Estuarine systems include nearshore zones and are one of the most productive natural ecosystems because they act as nurseries for many of the world's fisheries. In addition to providing important habitat for fish and wildlife, marine nearshore areas also contribute to recreation, economic, cultural, and historic values. Understanding of the marine nearshore areas in the region are, however, incomplete due to the complexity of the ecosystem, and the lack of funds to research these areas in greater detail (King County DNR, 2001).

### **4.2 Marine/Nearshore Areas in the City of Shoreline**

The following provides a preliminary description of selected characteristics along the marine nearshore areas of Puget Sound adjacent to the City of Shoreline and summarizes habitats and species that contribute to the City's marine nearshore areas. Information was compiled from existing literature and data sources, and summarizes current and historical information.

### **4.3 Functions of Nearshore Zones**

Puget Sound forms the western boundary of the City of Shoreline. The marine nearshore environment extends approximately 3.5 miles in the city limits and approximately one-half mile along the City's potential annexation area (Point Wells).

Nearshore zones contain many habitat types including eelgrass meadows, kelp forests, flats, tidal marshes, sub-estuaries, sand spits, beaches and backshores, banks and bluffs, and marine riparian vegetation. Nearshore habitat areas provide many critical functions including:

- Habitat for fish/wildlife;
- Nutrient processing;
- Wave and current energy buffering; and
- Foraging, rearing, refuge, migration for fish/wildlife.

### **4.3.1 Wetlands**

Tidal marshes include salt and freshwater habitats that experience tidal inundation (KCDNR, 2001). Several wetlands have been mapped by various sources in the City's shoreline jurisdiction. According to the 1987 National Wetlands Inventory (NWI), the entire marine nearshore area in the city limits and UGA boundary is designated as a Class 1 "estuarine intertidal regular unconsolidated shore" wetland. The King County Sensitive Areas Map Folio (King County, 1990) also identifies intertidal wetlands encompassing the entire nearshore area within the City's boundaries.

One non-tidal wetland has been documented in the City's marine nearshore zone (Tetrattech/KCM, 2003c). This palustrine forested wetland is less than one acre in size and is associated with Barnacle Creek. Priority habitats and species data indicate that a small (less than 1 acre) scrub/shrub wetland associated with Coyote Creek is also located in the marine nearshore zone.

### **4.3.2 Marine Riparian Zones**

Marine riparian vegetation is defined as vegetation overhanging the intertidal zone (King County DNR, 2001). Marine riparian zones function by: protecting water quality; providing wildlife habitat; regulating microclimate; providing shade, nutrients and prey; stabilizing banks; and providing large woody debris (Anchor Environmental and People for Puget Sound, 2002). Vegetated marine riparian zones are lacking within the marine nearshore area in the city limits (WDNR, 2001).

### **4.3.3 Banks and Bluffs**

Banks and bluffs are part of the riparian zone and function by providing sediment to adjacent beaches, habitat to bluff-dwelling animals, rooting area for riparian vegetation, and a source of groundwater seepage to marine waters (King County DNR, 2001). Shoreline development and armoring, vegetation clearing, and changes in hydrology, among others, can adversely impact bluffs. The ShoreZone Inventory (WDNR, 2001) maps indicate that there are moderate height inclined cliffs composed of fines/mud and sand in the areas north of and surrounding Richmond Beach Park.

### **4.3.4 Beaches and Backshore**

Beaches are generally steeper than tidal flats (King County DNR, 2001). Backshore areas are immediately landward of beaches and are zones inundated by storm-driven tides. A typical profile of an undisturbed shoreline in Central Puget Sound would include an upper backshore or storm berm area that collects logs, algae, and other debris during storms (King County DNR, 2001). The intertidal portion of the beach is typically relatively steep and comprised of a mixture of cobbles and gravel in a sand matrix (King County DNR, 2001).

Sediment abundance throughout the City's beaches is characterized predominantly as "moderate." Erosional areas are located south of the Innis Arden Reserve.

#### **4.3.5 Flats**

Flats generally include gently sloping sandy or muddy intertidal or shallow subtidal areas (King County DNR, 2001), and are used by juvenile salmonids, shorebirds, and shellfish, among others. Flats are generally located at the mouths of streams where sediment transported downstream is deposited, and in areas of low wave and current energies where longshore waves and currents deposit sediment (King County DNR, 2001). Sand flats are located in the vicinity of the Barnacle and Boeing Creek outlets. Sand and gravel flats are mapped in the Point Wells area, extending to the mouth of Barnacle Creek.

#### **4.3.6 Eelgrass Meadows**

The importance of eelgrass has been described in various sources, including the *Reconnaissance Assessment of the State of the Nearshore Environment* (King County DNR, 2001). Eelgrass beds are found in intertidal areas and provide feeding and rearing habitat for a large number of marine organisms. Eelgrass beds have been documented in Puget Sound in the marine nearshore areas within the city limits (Woodruff et al., 2001 and WDNR, 2001). Eelgrass has been documented throughout the entire marine nearshore area of the City of Shoreline, and are most dense north and south of the mouth of Boeing Creek (Woodruff et al., 2001).

#### **4.3.7 Kelp Forests**

The function of kelp has been described in *Reconnaissance Assessment of the State of the Nearshore Environment* (King County DNR, 2001). Kelp provides habitat for many fish species, including rockfish and salmonids, potential spawning substrate for herring, and buffering of shorelines from waves and currents, among other functions. A change in kelp distribution may indicate the coarsening of shallow subtidal sediments (such as that caused by erosion related to a seawall) or an increase in nutrient loading (such as from sewage effluent). Kelp is sporadic and limited in its extent throughout the marine nearshore areas within the city limits (Woodruff et al., 2001).

## 5 REFERENCES

### 5.1 Cited References

- Adamus, P.R., Clairan, E.J., Smith, R.D., and Young R.E. 1987. *Wetland Evaluation Technique (WET)*. 1987.
- Anchor Environmental, L.L.C. and People for Puget Sound. 2002. *Final Report Northwest Straits Nearshore Habitat Evaluation*. Prepared for Northwest Straits Commission (NWSC). Mount Vernon, WA.
- Azous, A.L. and R.R. Horner, editors. 2001. *Wetlands and Urbanization, Implications for the Future*. Lewis Publishers, New York, NY.
- Bledsoe, B. P., and C.C. Watson. 2001. Effects of Urbanization on Channel Instability. *Journal of American Water Resources Association*. Volume 37.
- Bolton, S. and Shellberg, J. 2001. *Ecological Issues in Floodplains and Riparian Corridors*. Center for Streamside Studies, University of Washington, Seattle, WA.
- Booth, D. B. 2000. *Forest Cover, Impervious Surface Area, and the Mitigation of Urbanization Impacts in King County, Washington*. Prepared for King County Water and Land Resources Division. Seattle, WA.
- Castelle, A.J., A.W. Johnson, and C. Conolly. 1994. Wetland and Stream Buffer Size Requirements - A Review. *J. Environ. Qual.* 23:878-882.
- Castelle, A.J., and A.W. Johnson. 2000. *Riparian Vegetation Effectiveness*. National Council for Air and Stream Improvement Tech. Bull. No. 799.
- Castelle, A.J., C. Conolly, M. Emers, E.D. Metz, S. Meyer, and M. Witter. 1992a. *Wetland Buffers: An Annotated Bibliography*. Publ. 92-11. Adolfson Assoc., for Shorelands and Coastal Zone Manage. Program, Washington Dept. of Ecology, Olympia, WA.
- City of Portland. 2001. *Streamside Science and an Inventory of Significant Riparian and Wetland Resources*. Discussion Draft. City of Portland, Oregon Bureau of Planning, Portland, OR.
- Cooke Scientific Services, Inc. 1995. *Wetland and Buffer Functions Semi-Quantitative Assessment Methodology*.
- Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service. Publ. # FWS/OBS-79/31. 131 p.

- Desbonnet, A., P. Pogue, V. Lee, and N. Wolff. 1994. *Vegetated Buffers in the Coastal Zone*. Coastal Resources Center, Rhode Island Sea Grant, Univ. of Rhode Island.
- Erwin, K.L. 1990. *Wetland Evaluation for Restoration and Creation*. In Kusler, J.A., and M.E. Kentula, eds. *Wetland Creation and Restoration: The Status of the Science*. Island Press, Washington, D.C.
- Federal Register. 1982. *Title 33: Navigation and Navigable Waters; Chapter II, Regulatory Programs of the Corps of Engineers*. Volume 47, No. 138, p. 31810. U.S. Government Printing Office, Washington, D.C.
- Federal Register. 1986. 40 CFR Parts 320 through 330: *Regulatory Programs of the Corps of Engineers; Final Rule*. Volume 51, No. 219, pp. 41206-41260. U.S. Government Printing Office, Washington, D.C.
- FEMAT. 1993. *Forest Ecosystem Management: An Ecological, Economic and Social Assessment*. Report of the Forest Ecosystem Management Assessment Team, USDA Forest Service et al., Washington, D.C.
- Gwin, S.E., M.E. Kentula, P.W. Shaffer and U.S. Environmental Protection Agency. 1999. *Evaluating the Effects of Wetland Regulation Through Hydrogeomorphic Classification and Landscape Profiles*. *Wetlands* Vol. 19, No.3, pp. 477-489.
- Herson-Jones, L.M., M. Heraty and B. Jordan. 1995. *Riparian Buffer Strategies for Urban Watersheds*. Metropolitan Washington Council of Governments, Publ. No. 95703, Washington, D.C.
- Horner, R.R., and C.W. May. 1999. *Regional Study Supports Natural Land Cover Protection as Leading Best Management Practice for Maintaining Stream Ecological Integrity*. Comprehensive Stormwater & Aquatic Ecosystem 1999 – Conference Papers Vol. 1:233-247, Feb. 22 – 26, 1999, Auckland, New Zealand.
- Hruby, T., W.E. Cesanek, and K.E. Miller. 1995. *Estimating Relative Wetland Values for Regional Planning*. *WETLANDS*, Vol. 15, pp. 93-107.
- Johnson, A.W., and D. Ryba. 1992. *A Literature Review of Recommended Buffer Widths to Maintain Various Functions of Stream Riparian Areas*. King County Surface Water Management Division, Seattle, WA.
- Jones, J.J., J.P. Lortie, and U.D. Pierce, Jr. 1988. *The Identification and Management of Significant Fish and Wildlife Resources in Southern Coastal Maine*. Maine Department of Inland Fisheries and Wildlife, Augusta, ME. 140 pp.
- Kentula, M.E. 2002. *Tracking Changes in Wetlands and Urbanization: Sixteen Years of Experience in Portland, OR.* US EPA presentation at Urban Wetlands Sustaining Multiple Functions Conference. May 20-21, 2002. Portland State University, Portland, OR.

- King County Department of Natural Resources (KCDNR). 2001. *Reconnaissance Assessment of the State of the Nearshore Report: Including Vashon and Maury Islands (WRIAs 8 and 9)*. Seattle, WA.
- Kusler, J. 1992. *Mitigation Banks and the Replacement of Wetland Functions and Values*. In *Effective Mitigation: Mitigation Banks and Joint Projects In the Context of Wetland Management Plans*. Proceedings from National Wetland Symposium. June 24-27, 1992. Palm Beach Gardens, FL.
- Kusler, J.A., and M.E. Kentula, eds. 1990. *Wetland Creation and Restoration: The Status of the Science*. Island Press, Washington, DC.
- Larson, M. 2000. *Effectiveness of Large Woody Debris in Stream Rehabilitation Projects in Urban Basins*. Center for Urban Water Resources Management, Seattle, WA.
- Leavitt, J. 1998. *The Functions of Riparian Buffers in Urban Watersheds*. Masters Thesis. University of Washington. Seattle, WA.
- Magee, T.K., T.L. Ernst, M.E. Kentula, and K.A. Dwire. 1999. Floristic Comparison of Freshwater Wetlands in an Urbanizing Environment. *Wetlands* Vol. 19, No.3, pp. 517-534.
- May, C.W., R.R. Horner, J.R. Karr, B.W. Mar, and E.B. Welsh. 1997a. Effects of Urbanization on Small Streams in the Puget Sound Lowland Ecoregion. *Watershed Protection Techniques* 2:483-494.
- May, C.W., R.R. Horner, J.R. Karr, B.W. Mar, and E.B. Welsh. 1997b. *Quality Indices for Urbanization Effects in Puget Sound Lowland Streams*. Wat. Res. Tech. Rep 154. Washington Department of Ecology, Olympia, WA.
- Mitsch, W. J. and J.G. Gosselink. 2000. *Wetlands*. 3rd ed. Van Nostrand Reinhold, New York, NY.
- Mockler, A., L. Casey, M. Bowles, N. Gillen, and J. Hansen. 1998. *Results of Monitoring King County Wetland and Stream Mitigations*. King County Department of Environmental Services, King County, WA.
- Naiman, R.J., T.J. Beechie, L.E. Benda, D.R. Berg, P.A. Bisson, L.H. MacDonald, M.D. O'Connor, P.L. Olson, and E.A. Steel. 1992. *Fundamental Elements of Ecologically Healthy Watersheds in the Pacific Northwest Coastal Ecoregion*. In Naiman, R.J., ed. *Watershed Management. Balancing Sustainability and Environmental Change*. Springer-Verlag. New York, New York, NY. 542 p.
- Novitski R.P., D. Smith, and J.D. Fretwell. 1995. *Restoration, Creation and Recovery of Wetlands: Wetland Functions, Values and Assessment*. United States Geological Survey Water Supply Paper 2425.

- O'Connell, M.A. J.G. Hallett, S.D. West, K.A. Kelsey, D.A. Manuwal, and S.F. Pearson. 2000. *Effectiveness of Riparian Management Zones in Providing Habitat for Wildlife*. Submitted to the LWAG, Timber Fish and Wildlife Program. Cheney, WA.
- Pitt, D.G., W.G. Gould, and L. LaSota. 1986. *Landscape Design to Reduce Surface Water Pollution in Residential Areas*. Water Resources Information Bulletin No. 5. Univ. of Maryland. Cooperative Extension Service.
- Reppert, R.T., W. Sigles, E. Stakhiv, L. Messman, and C. Meyers. 1979. *Wetlands Values: Concepts and Methods for Wetlands Evaluation*. Res. Rpt. 79-R1. Inst. for Water Resources, U.S. Army Corps of Engineers, Fort Belvoir, VA.
- Richards, C., L.B. Johnson, and G.E. Host. 1996. Landscape-Scale Influences on Stream Habitats and Biota. *Can. J. Fish Aquat. Sci.* 53:295-311.
- Roni, P., T.J. Beechie, R.E. Bilby, F.E. Leonetti, M.M. Pollock, and G.R. Pess. 2002. A Review of Stream Restoration Techniques and a Hierarchical Strategy for Prioritizing Restoration in Pacific Northwest Watersheds. *North American Journal of Fisheries Management*. 22:1-20.
- Tetra Tech/KCM, Inc. 2003a. *Boeing Creek Basin Characterization Report*. Prepared for the City of Shoreline, WA.
- Tetra Tech/KCM, Inc. 2003b. *City of Shoreline Stream Inventory and Assessment*. Prepared for the City of Shoreline, WA.
- Tetra Tech/KCM, Inc. 2003c. *City of Shoreline Wetland Inventory and Assessment*. Prepared for the City of Shoreline, WA.
- Tetra Tech/KCM, Inc. 2003d. *Middle Puget Sound Basin Characterization Report*. Prepared for the City of Shoreline, WA.
- Washington Department of Ecology. 1991. *Washington State Wetlands Rating System: Western Washington*. Publication 93-074, Olympia, WA.
- Washington Department of Ecology. 1996. *Water Quality Guidelines for Wetlands: Using the Surface Water Quality Standards for Activities Involving Wetlands*. Publication 96-06, Olympia, WA.
- Washington Department of Ecology. 1997. *Washington State Wetlands Identification and Delineation Manual*. Publication 96-94, Olympia, WA.
- Washington Department of Ecology. 2001. *Washington State Wetland Mitigation Evaluation Study Phase 2: Success*. Publication 01-06-021. Olympia, WA.
- Washington Department of Fish and Wildlife. 1998. *1997 Washington Salmonid Stock Inventory. Appendix Bull Trout and Dolly Varden*. Olympia, WA.



Washington Department of Natural Resources (WDNR). 2001. *Washington State ShoreZone Inventory*. Nearshore Habitat Program, Washington State Department of Natural Resources. Olympia, WA.

Washington Office of Community Development (OCD). 2002. *Model Code Recommendations for Designating and Protecting Critical Areas, First Edition, 2<sup>nd</sup> Draft*. Prepared by Berryman & Henigar Inc., Adolfson Associates Inc., and GeoEngineers, Inc. OCD, Olympia, WA.

Williams, R.D., and E.D. Lavey. 1986. *Selected Buffer References*. Water Quality and Watershed Research Laboratory, Durant, OK.

Woodruff, D.L., P.J. Farley, A.B. Borde, J.S. Southard, and R.M. Thom. 2001. *King County Nearshore Habitat Mapping Data Report: Picnic Point to Shilshole Marina*. Prepared for King County Department of Natural Resources, Seattle, WA.

## 5.2 Other References

Adolfson Associates. 1999a. *Final Environmental Impact Statement Volume 1: Shoreview Park Capital Project*. Prepared for the City of Shoreline, WA.

Adolfson Associates. 1999b. *Final Environmental Impact Statement Volume 2: Shoreview Park Capital Project*. Prepared for the City of Shoreline, WA.

Battelle Marine Sciences Laboratory. 2001. *King County Nearshore Habitat Mapping Data Report: Picnic Point to Shilshole Marina*. Prepared for the King County Department of Natural Resources, Seattle, WA.

Benfield, E. F. and J. R. Webster. 1985. Shredder abundance and leaf breakdown in an Appalachian Mountain stream. *Freshwater Biology* Volume 15.

Bjorn, T.C. and D.W. Reiser. 1991. *Habitat Requirements of Salmonids in Streams*. In Meehan, W.R., ed. *Influences of Forest and Rangeland Management on Salmonid Fishes and their Habitats*. American Fisheries Society Special Publication 19.

Booth, D.B. 1991. Urbanization and the Natural Drainage System—Impacts, Solutions, and Progress. *Northwest Environmental Journal* 7(1): 93-118.

Booth, D.B. and L. Reinelt. 1993. *Consequences of Urbanization on Aquatic Systems: Measured Effects, Degradation Thresholds, and Corrective Strategies*. Pp. 540-550 *In Proceedings Watershed '93 A National Conference on Watershed Management*. March 21-24, 1993. Alexandria, VA.

Brazier, J.R. and G.W. Brown. 1973. *Buffer Strips for Stream Temperature Control*. Research Paper No. 15, Forest Research Lab, Oregon State Univ., Corvallis, OR.

- Castelle, A.J., C. Conolly, M. Emers, E.D. Metz, S. Meyer, M. Witter, S. Mauermann, T. Erickson, and S.S. Cooke. 1992. *Wetland Buffers: Use and Effectiveness*. Publ. 92-10. Adolfson Assoc., for Shorelands and Coastal Zone Manage. Program, Washington Dept. of Ecology, Olympia, WA.
- City of Shoreline. 1998. *Final Shoreline Comprehensive Plan*. Adopted November 23, 1998. Shoreline, WA.
- City of Shoreline. 2001. *Comprehensive Plan 2001: Representation of Official Comprehensive Plan Land Use Map Adopted by City Ordinance No. 292*. Shows amendments through July 26, 2001. Shoreline, WA.
- City of Shoreline. 2002. *Zoning, 2002: Representation of Official Zoning Map Adopted by City Ordinance No. 292*. Shows amendments through November 13, 2001. Shoreline, WA.
- City of Shoreline. 2003. Shoreline Municipal Code. Current through Ordinance 329, passed April 28, 2003. Shoreline, WA.
- Cooke Scientific Services, Inc. 1992. *Wetland Buffers - A Field Evaluation of Buffer Effectiveness in Puget Sound*. Prepared for Washington Department of Ecology, Olympia, WA.
- Corbett, E.S. and J.A. Lynch. 1985. *Management of Streamside Zones on Municipal Watersheds*. pp. 187-190 in R. R. Johnson, C.D. Ziebell, D.R. Patton, P.F. Folliott, and R.H. Hamre (eds.), *Riparian Ecosystems and their Management: Reconciling Conflicting Uses*. First North American Riparian Conference, April 16-18, 1985, Tucson, AZ.
- Federal Emergency Management Agency (FEMA). 1995. *Q3 Flood Data, depicting Flood Insurance Rate Map, King County, Washington*.
- Gregory, S.V. 1980. *Effects of Light, Nutrients, and Grazing on Periphyton Communities in Streams*. Ph.D. thesis. Oregon State University, Corvallis, OR.
- Gregory, S.V., F.J. Swanson, W.A. McKee, and K.W. Cummins. 1991. An Ecosystem Perspective of Riparian Zones: Focus on Links Between Land and Water. *BioScience* 41:540-551.
- Horner, R.R., and C.W. May. 2000. *Watershed Urbanization and the Decline of Salmon in Puget Sound Streams*. Center for Urban Water Res. Management, University of Washington, Seattle, WA.
- King County. 2003. Geographic Information Systems (GIS) Data.
- King County. 1990. *King County Sensitive Areas Map Folio*.

- Knutson, K.C. and V.L. Naef. 1997. *Management Recommendations for Washington's Priority Habitats: Riparian*. Washington Department of Fish and Wildlife, Olympia, WA.
- Lamb, J. C. 1985. *Water Quality and Its Control*. John Wiley and Sons. New York, NY.
- Lemberg, N.A., M.F. O'Toole, D.E. Pentilla, and K.C. Stick. 1997. *Washington State Department of Fish and Wildlife, 1996 Forage Fish Stock Status Report. Stock Status Report No. 98-1*. Washington State Department of Fish and Wildlife, Olympia, WA.
- Lynch, J.A., E.S. Corbett, and K. Mussallem. 1985. Best Management Practices for Controlling Nonpoint-Source Pollution on Forested Watersheds. *J. Soil Wat. Conserv.* 40:164-167.
- McDade, M.H., F.J. Swanson, W.A. McKee, J.F. Farnklin, and J. Van Sickle. 1990. Source Distances for Coarse Woody Debris entering Small Streams in Western Oregon and Washington. *Can. J. For. Res.* 20:326-330.
- McMillan, A. 2000. *The Science of Wetland Buffers and Its Implications for the Management of Wetlands*. Masters Thesis, The Evergreen State College and Washington Department of Ecology, Olympia, WA.
- Meehan, W.R., F.J. Swanson, and J.R. Sedell. 1977. *Influences of Riparian Vegetation on Aquatic Ecosystems with Particular Reference to Salmonid Fishes and Their Food Supply*. USDA Forest Service General Technical Report MR-43. Contributed paper, Symposium on the Importance, Preservation and Management of the Riparian Habitat, July 9, 1977, Tucson AZ.
- Murphy, M.L. and K V. Koski. 1989. Input and Depletion of Woody Debris in Alaska Streams and Implications for Streamside Management. *N. Am. J. Fish. Mang.* 9:427-436.
- National Marine Fisheries Service. 1996. *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale*. NMFS Environmental and Technical Services Division.
- Newbold, J.D., D.C. Erman, and K.B. Roby. 1980. Effects of Logging on Macroinvertebrates in Streams With and Without Buffer Strips. *Can. J. Fish Aquat. Sci.* 37:1076-1085.
- Nightingale, B. and C. Simenstad. 2001. *Overwater structures: Marine issues*. Prepared for Washington Department of Fish and Wildlife, Washington Department of Ecology, and Washington Department of Transportation. University of Washington. Seattle, WA.
- O'Toole, M. 1995. *Puget Sound Herring: A Review*. In Proceedings of Puget Sound Research. 1995. pp. 849-854. Puget Sound Water Quality Authority, Seattle, WA.

- O'Neil, T. A., D. H. Johnson, C. Barrett, M. Trevithick, K. A. Bettinger, C. Kiilsgaard, M. Vander Heyden, E. L. Greda, D. Stinson, B. G. Marcot, P. J. Doran, S. Tank, and L. Wunder. *Matrixes for Wildlife-Habitat Relationship in Oregon and Washington*. Northwest Habitat Institute. 2001. In D. H. Johnson and T. A. O'Neil (Manag. Dirs.) *Wildlife-Habitat Relationships in Oregon and Washington*. Oregon State University Press, Corvallis, OR.
- Reiser, D.W. and T.C. Bjornn. 1979. *Habitat Requirements of Anadromous Salmonids*. USDA Forest Service. Pacific Northwest Forest and Range Experiment Station. General Technical Report PNW-96.
- Roby, K.B., D.C. Erman, and J.D. Newbold. 1977. *Biological Assessment of Timber Management Activity Impacts and Buffer Strip Effectiveness on National Forest Streams of Northern California*. USDA - Forest Service, California Region.
- Rudolph, D.C., and J.G. Dickson. 1990. Streamside Zone Width and Amphibian and Reptile Abundance. *The Southwestern Naturalist* 35:472-476.
- Shirvell, C. S. 1990. Role of instream rootwads as juvenile coho salmon (*Oncorhynchus kisutch*) and steelhead trout (*O. mykiss*) cover habitat under varying streamflows. *Canadian Journal of Fisheries and Aquatic Science*. Volume 47.
- Steinblums, I., H. Froehlich, and J. Lyons. 1984. *Designing Stable Buffer Strips for Stream Protection*. U.S. Forest Service, 2520 Watershed Protection and Management.
- Swales, S. and C. D. Levings. 1989. Role of off-channel ponds in the life cycle of coho salmon (*Oncorhynchus kisutch*) and other juvenile salmonids in the Coldwater River, British Columbia. *Canadian Journal of Fisheries and Aquatic Science*. Volume 46.
- Thomas, R. E., J. A. Gharrett, M. G. Carls, S. D. Rice, A. Moles, and S. Korn. 1986. Effects of fluctuating temperature on mortality, stress, and energy reserves of juvenile coho salmon. *Transactions of the American Fisheries Society*. Volume 115.
- United States Department of Agriculture, Natural Resources Conservation Service (USDA SCS). 1973. *King County Soil Survey*.
- United States Department of Agriculture, Natural Resources Conservation Service (USDA SCS). 1983. *Snohomish County Soil Survey*.
- United States Department of the Interior (USDI). 1987a. *National Wetlands Inventory, Edmonds West, Washington 7.5-minute USGS Quadrangle*.
- United States Department of the Interior (USDI). 1987b. *National Wetlands Inventory, Seattle North, West, Washington 7.5-minute USGS Quadrangle*.

- United States Department of the Interior Fish and Wildlife Service (USFWS). 1998. *A Framework to Assist in the Making of Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Bull Trout Subpopulations Watershed Scale (Draft)*. Washington, DC.
- Van Sickle, J. and S.V. Gregory. 1990. Modeling Inputs of Large Woody Debris to Streams from Falling Trees. *Can. J. For. Res.* 20:1593-1601.
- Vannote, R.L., G.W. Minshall, K.W. Cummins, J.R. Sedell, and C.E. Cushing. 1980. The River Continuum Concept. *Canadian Journal of Fisheries and Aquatic Science* 37:130-137.
- Washington Department of Agriculture Pesticide/ESA Task Force. 2001. *A Process for Evaluating Pesticides in Washington State Surface Waters for Potential Impacts to Salmonids*. WSDA Publication No. 057, Olympia, WA.
- Washington Department of Fish and Wildlife (WDFW) and Western Washington Treaty Indian Tribes. 1994. *1992 Washington State Salmon and Steelhead Stock Inventory*. Olympia, WA.
- Washington Department of Fish and Wildlife (WDFW). 1997. *Wild Salmonid Policy. Washington Department of Fish and Wildlife Final Environmental Impact Statement*. Washington Department of Fish and Wildlife. Olympia, WA.
- Washington Department of Fish and Wildlife (WDFW). 2003. *Priority Habitats and Species, "StreamNet", and Marine Resources Species databases*. Olympia, WA.
- Williams, R.W., R.M. Laramie, and J.J. James. 1975. *A Catalog of Washington Streams and Salmon Utilization: Volume 1, Puget Sound Region*. Washington State Department of Fisheries. Olympia, WA.
- Williams, R.W., R.M. Laramie, and J.J. James. 1975. *A Catalog of Washington Streams and Salmon Utilization, Volume 1, Puget Sound Region*. Washington Department of Fisheries. Olympia, WA.
- Wong, S.L., and R.H. McCuen. 1982. *The Design of Vegetative Buffer Strips for Runoff and Sediment Control*. A Technical Paper Developed as Part of a Study of Stormwater Management in Coastal Areas Funded by Maryland Coastal Zone Management Program.
- Wydoski, R.S. and R.R. Whitney. 1979. *Inland Fishes of Washington*. University of Washington Press. Seattle, WA.

### 5.3 Web Sites

King County Department of Natural Resources Website. *Beach Assessment Program*.

Available online at: <http://dnr.metrokc.gov/wlr/waterres/beaches/bmain.htm>

(accessed September 2003).

Washington Department of Ecology. 2001. *Focus: Riparian Areas*. Washington

Department of Ecology. Available online at:

<http://www.ecy.wa.gov/pubs/0010023.pdf>

Washington State Department of Ecology (Ecology). *Digital Coastal Zone Atlas*.

Available online at: [http://www.ecy.wa.gov/programs/sea/SMA/atlas\\_home.html](http://www.ecy.wa.gov/programs/sea/SMA/atlas_home.html)

(accessed September 2003).

Washington Department of Ecology. *Final 1998 Section 303(d) List – WRIA 8*.

Available online at:

<http://www.ecy.wa.gov/programs/wq/303d/1998/wrias/wria8.pdf> (accessed

September 2003).

Washington State Department of Health Website. *Recreational Shellfish Beach Closures*.

Available online at: <http://www.doh.wa.gov/> (accessed September 2003).