CITY OF BELLEVUE'S CRITICAL AREAS UPDATE

Risk Analysis of No Action, Regulatory, City Programs, and Best Available Science Alternatives for Improving Critical Areas Protection

Prepared for

City of Bellevue

June 2005

Note:
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Risk Analysis of No Action, Regulatory, City Programs, and Best Available Science Alternatives for Improving Critical Areas Protection

Prepared for

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1.0 Introduction

The study area for this analysis encompasses the city of Bellevue. Bellevue is a city of approximately 110,000 people, and a total land area of about 32 square miles. Bellevue is located approximately 3 miles east of Seattle, Washington, between Lake Washington and Lake Sammamish.

The city of Bellevue proposes to revise its critical areas protection strategy to ensure that the regulation and management of the city's critical areas is based on scientifically defensible principles, in conformance with requirements of the Washington State Growth Management Act (GMA). This document analyses the risk associated with strategies Bellevue has proposed to implement critical areas protection for the following critical areas: Geological Hazards, Frequently Flooded Areas, Streams and Riparian Areas, Wetlands, Shorelines, and Wildlife Habitat Conservation Areas.

Four strategies are assessed in this report. They include a No Action Alternative, a Regulatory Alternative, a City Programs Alternative, and an alternative constructed from best available science (BAS) recommendations (called the BAS Based Alternative) (Herrera 2005). The analysis describes expected risks from the implementation of each alternative on critical areas protection. The Growth Management Act requires local jurisdictions to include BAS in updating their critical areas regulations and policies. Where the jurisdiction departs from BAS, any risks associated with such departures should be identified. The BAS Based Alternative was generated to assist in identifying any such departures for the alternatives under consideration by the city, and to allow the associated risk to be noted and analyzed.

The analysis describes the risks to ecological conditions that would be expected to result from each alternative, at five years and at fifty years after implementation. In addition, the analysis describes the expected risks to public health, and safety that would likely result from each alternative from geologic hazards and frequently flooded areas.

2.0 Methods and Assumptions

The risks associated with different alternatives to update Bellevue's critical area ordinances were evaluated by adapting a model provided in the document *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996). The model uses a matrix of pathways and indicators to determine existing conditions and to evaluate the effect of future activities. The model was adapted to evaluate the risk to public health and safety from geologic hazards and frequently flooded areas, and the risk to ecological functions provided by shorelines, streams, wetlands and wildlife habitat from four alternative strategies. The alternative strategies for critical areas protection include a set of more protective regulations (called the Regulatory Alternative), a set of city of Bellevue sponsored programs (called the City Programs Alternative), a No Action Alternative comprising no changes in city regulations or programs, and a set of recommendations derived from a best available science review of critical areas protection in Bellevue, called the BAS Based Alternative (Herrera 2005).

The model uses two matrices r called the Criteria Matrix, and the Environmental Conditions and Risk Analysis Matrix for each critical area. The Criteria Matrix provides the basis for assessing whether a given pathway is, ecologically speaking, properly functioning, at risk, or not properly functioning for physical, chemical, and biological parameters used to gauge the conditions of such functions under existing conditions. For geologic hazards, the standards relate to human health and safety. Therefore, existing conditions in geologic hazards and frequently flooded areas are characterized as properly protected or not properly protected. When data was unavailable for categorizing at risk conditions, only properly functioning or not properly functioning conditions were included in the matrices.

The following chapters provide an Environmental Conditions and Risk Analysis Matrix and accompanying text documenting existing conditions for each critical area and the results of the risk analysis for the four alternatives: No Action, Regulatory, City Programs, and BAS Based. For each of these four alternatives, the risk analysis determines whether the alternative will affect the indicator by moving it toward a properly functioning condition (PFC), toward a not properly functioning condition (NPC) (or in the case of geologic hazards and frequently flooded areas, properly protected condition (PPC) or not properly protected condition (NPC), will not change the indicator (stay neutral, N), or if the effect of the implementation of a given alternative is unknown (U). The Environmental Conditions and Risk Analysis Matrix corresponding to each critical area summarize the risk analysis results and the rationale provided in the report. Two time periods were used to analyze risk, a near term period of 5 years and a long term period of 50 years.

It is important to note that the analysis results obtained using the NMFS adapted model were based on evaluating the impact of each alternative on an indicator over an entire basin. A number of the ecological indicators, particularly for riparian areas and shorelines, would rate higher if evaluated at a smaller scale such as a stream or shoreline reach or for individual wetlands.

The standard mandated by the Growth Management Act (GMA) is to *maintain* the structure, value, and functions of critical areas. After completing the risk analysis using the Environmental Conditions and Risk Analysis Matrices for each critical area, this data was summarized in a table that characterizes the impact of each alternative based on the GMA standard. The categories include (1) critical area functions and public health and safety would be *maintained* as properly protected or at risk, would *improve* relative to current conditions, or would result in *degraded* conditions if the action continued over the analysis period. This analysis was completed for both the near (5 year) and long (50 year) term.

These summary assessments describing the trends of each alternative on existing conditions were the basis for an environmental impact statement developed for this project (Bellevue 2005a) that evaluated the No Action, Regulatory, and City Programs Alternatives. These summary assessments are located in the Summary and Conclusions section located at the end of this report.

Both a redevelopment rate and an analysis of available vacant lands were used to determine the potential benefits of extending critical areas buffers. The analysis of vacant lands was limited to the Kelsey Creek watershed but afforded a general picture of the potential for increased critical areas protection resulting from increasing the size of regulated buffers. Geographic Information System (GIS) analysis was used to estimate:

- Total wetland area and stream length within the Kelsey Creek watershed
- Total area of existing and proposed wetland buffers
- Total area of existing and proposed stream buffers, total area of existing and proposed shoreline (Lake Washington and Lake Sammamish) buffers
- Total area of vacant land available within each of these existing and proposed buffers
- Length of streams adjacent to vacant land.

GIS shapefiles of wetlands, streams, and parcels, and a land use table developed by the city of Bellevue were used in this analysis. Existing wetland and stream classifications were used when available, and estimates based on proximity and connectivity to adjacent resources were made to classify remaining resources. Buffers were applied to wetlands and streams based on classification and resulting areas were recorded. Vacant lands determined with the land use table and GIS parcel file were intersected with wetland, stream, and shoreline buffers to determine total available vacant land within each.

The impacts from all the alternatives were analyzed with the assumption that in existing developed areas some redevelopment would occur. When a house is completely removed, or when the value of a remodel exceeds 100 percent of the value of the existing house, the new house is required to be developed in compliance with critical areas regulations. As a result,

when lots that are non-conforming with regard to critical areas regulations are redeveloped, a greater degree of protection of the critical area would result than at present.

Based on city of Bellevue city-wide permit data, it is expected that, in single-family areas, approximately 0.3 percent of the existing housing stock would be redeveloped each year (Paine 2005 personal communication). In the near term (designated as five years), this would result in replacement of 1.5 percent of the housing stock. In the long term (designated as 50 years), approximately 15 percent of single-family housing units would be replaced with new single-family houses. It is also assumed that all privately owned vacant parcels would be developed over the long term.

Parcels that include areas protected under existing and proposed critical areas regulations were identified using city of Bellevue critical areas maps (Bellevue 2005c) and King County parcel information (King County 2005). Of the parcels identified, some would have adequate area to provide full buffers as required by the critical areas regulations, but others would not have adequate area to develop without intruding to some degree on the required buffers. For this analysis, it was assumed that 50 percent of the land area on lots with critical areas and buffers would be protected as land was redeveloped. The remainder of those lots would either be outside of the required buffer, or would have development that would be allowed under the exceptions provided in the Code for lots where development would otherwise be unduly restricted by the regulations.

For streams, redevelopment would result in approximately 10 acres of protected critical area on currently developed lots that would be added to the buffers of streams after 5 years, and 100 acres after 50 years.

For wetlands, the city is aware that the mapped inventory of wetlands does not include all wetlands in the city. Therefore the estimated areas are lower than the actual, but without a full inventory of wetlands, it is impossible to predict how much more land would be affected. Based on the available inventory of wetlands, this represents a minimum of 1.75 acres of protected area on currently developed lots that would be added to the buffers of wetlands after 5 years, and a minimum of 17.5 acres after 50 years.

It is further assumed that under the proposed regulations, native vegetation in stream and wetland buffers would be protected from removal, and that the native riparian forest would re-establish itself. Due to the degree of degradation in the ecosystem at present, the presence of urban uses and invasive non-native plants, domestic animals, and people, additional buffers provided though regulation may not provide all of the functions provided by a buffer in a pristine environment. In addition, buffers can only counteract local effects of urbanization, and changes to basin-wide hydrology due to artificial drainage systems (such as for roads or buildings) can reduce the effectiveness of buffers in protecting stream hydrology and water quality.

Bellevue clearing and grading regulations require best management practices to protect against increased slope instability, soil erosion, stream sedimentation, and excessive stormwater runoff, as a result of development. These measures both limit risks to people and property, but also

reduce the risk of ecological damage to critical areas such as streams and wetlands. In addition, it is expected that the city will update its stormwater regulations in 2006 to meet current Department of Ecology guidelines.

In addition to the proposed alternatives for increasing protection of critical areas, the analysis also assumes vigorous application of current stormwater regulations. While there are existing areas of highly erosive flows, most new lots are required to provide stormwater control. In addition, new or major redevelopment may actually improve flows in some areas due to better stormwater controls.

3.0 Assumptions and Description of Alternatives

The following sections detail the four alternatives analyzed in this EIS. The alternatives include a No Action Alternative, a Regulatory Alternative, a City Programs Alternative and a best available science (BAS) Based Alternative. These alternatives are described further below, but share some common assumptions regarding development and redevelopment rates. These are particularly important to understanding how the redevelopment rates would affect the effectiveness of the alternatives over time, especially the effectiveness of the Regulatory Alternative.

The impacts from all the alternatives were analyzed with the assumptions that most vacant land that is allowed to be developed under the code would be developed within 50 years, and that in existing developed areas redevelopment would occur at approximately the rate that it has been occurring in recent years. Both existing and proposed critical area regulations would have a limited effect on property that has already been developed. Existing development that does not conform to critical areas regulations is considered non-conforming. When a non-conforming house is completely removed, or when the value of a remodel exceeds 100 percent of the value of the non-conforming house, the new or remodeled house is required to be developed in compliance with critical areas regulations. As a result, lots with non-conforming development that are redeveloped will provide a greater degree of protection of the critical area.

Based on city of Bellevue permit data, it is expected that, in single-family areas, approximately 0.3 percent of the existing housing stock would be redeveloped each year (Paine 2005 personal communication). In the near term (designated as five years), this would result in replacement of 1.5 percent of the housing stock. In the long term (designated as 50 years), approximately 15 percent of single-family housing units would be replaced with new single-family houses. It is also assumed that all privately owned vacant parcels would be developed over the long term. This would affect approximately 309 parcels and 0.89 percent of the city land area in five years and approximately 3,097 parcels and 15 percent of the city land area over 50 years.

Parcels that include streams and wetlands protected under existing and proposed critical areas regulations were identified using city of Bellevue critical areas maps (Bellevue 2005c) and King County parcel information (King County 2005) for the entire city. Of the parcels identified, some would have adequate area to provide full buffers as required by the critical areas regulations but others would not have adequate area to develop without intruding to some degree on the required buffers. An average lot size of 0.59 acres was used to calculate the land area that would be redeveloped. For this analysis, it was assumed that 50 percent of the land area on lots with required buffers would be protected. The remainder of those lots would either be outside of the required buffer, or would have development that would be allowed under the exceptions provided in the Code for lots where development would otherwise be unduly restricted by the regulations.

This information was used to calculate the rate that land that would come into conformance with the Regulatory Alternative as a result of redevelopment. For streams, redevelopment would

result in approximately 10 acres of protected area on currently developed lots that would be added to the buffers of streams after 5 years, and 100 acres after 50 years.

Parcels with wetlands or adjacent to wetlands numbered 415 for the city. Assuming a 0.3 percent redevelopment rate would mean about 0.74 acres per year will be subject to the Regulatory Alternative. For wetlands, the city is aware that the mapped inventory of wetlands does not include all wetlands in the city. Therefore the estimated areas are lower than the actual, but without a full inventory of wetlands, it is impossible to predict how much more land would be affected. Based on the available inventory of wetlands, this represents about 1.75 acres of protected area on currently developed lots that would be added to the buffers of wetlands after 5 years, and about 17.5 acres after 50 years. These areas are the estimated minimum that would be protected under the Regulatory Alternative as a result of redevelopment.

It is further assumed that under the Regulatory Alternative, native vegetation in stream and wetland buffers would be protected from removal, and that the native riparian forest would reestablish itself. Due to the degree of degradation in the ecosystem at present, and the presence of urban uses and invasive non-native plants, domestic animals, and people, additional buffers provided though regulation can only be expected to provide some of the functions provided by a buffer in a pristine environment. In addition, buffers can only counteract local effects of urbanization, and changes to basin-wide hydrology due to artificial drainage systems (such as those for roads or buildings) can reduce the effectiveness of buffers in protecting stream hydrology and water quality. The city expects to address basin-wide hydrology issues in an update of the stormwater regulations in 2006.

3.1 No Action Alternative

The existing Land Use Code (Part 20.25H Sensitive Area Overlay District and Part 20.2E Shoreline Overlay District) comprises the No Action Alternative. Development would also be subject to existing state and federal regulations that protect some of the resources in critical areas. In the No Action Alternative, some city programs that currently exist would continue, including acquisition of greenways, open space, and trail linkages as identified in the Parks Open Space Plan; utilities maintenance and rehabilitation efforts, including fish passage improvement projects; Parks maintenance activities in native growth protection areas (NGPA); and existing education and stewardship programs.

3.2 Regulatory Alternative

The Regulatory Alternative comprises several Land Use Code (LUC) amendments for geologically hazardous areas, frequently flooded areas, streams and riparian areas, wetlands, shorelines, and wildlife habitat conservation areas. The following sections describe the changes proposed for the regulation of each type of critical area under the Regulatory Alternative. It should be noted that the regulatory program being proposed in the Regulatory Alternative, while

science-based to some degree, is not representative of best available science and consequently would be expected to have a limited or no effect on some critical area functions over the long term. Appendix A includes the complete text of the city's draft ordinances for the Regulatory Alternative.

3.2.1 City-wide and All Critical Areas

Certain amendments are proposed that impact properties city-wide, regardless of whether they contain a critical area or not. Those amendments include impervious surface area standards and City-wide requirements for improved soil amendments in landscaping areas for multi-family and nonresidential projects will be implemented. For all such areas, the proposed code requires that 50 percent of plants be native species.

Proposed code amendments affecting all critical areas would include modifications to minimum lot size, density, and lot coverage, to better protect critical areas. Under the Regulatory Alternative, the LUC would contain new rules for redevelopment of nonconforming structures and uses in certain situations. Calculation of development "credit" from critical areas will be revised for all types of development. The overall amount of development that, absent critical areas, could be realized will not change, but the proposed regulations will increase the size of the development "credit" from critical areas that may be "moved" to the buildable part of the site. The Regulatory Alternative will also add flexibility in development standards for property owners who propose critical areas enhancements, such as increasing native vegetation in a buffer, so long as the proposal results in as much or more protection of the critical area as is provided by the standard regulations. This flexibility does not exist in the current LUC.

Under the Regulatory Alternative, the LUC requirements for front, rear, and side yard size outside of critical areas could be decreased in favor of providing the fullest possible protection of critical areas while still allowing development of individual lots. Lot coverage and impervious surface standards that are normally applied on an individual lot basis could also be modified to allow calculation that includes open space tracts set aside to protect critical areas. In addition, the Regulatory Alternative clarifies the method for calculating density allowed on residential, multi-family, subdivisions, and commercial lots with critical areas (for the portion of the lot outside of the critical area and its buffer).

The Regulatory Alternative adds a provision which allows density to be clustered on smaller lots in a subdivision that provides a tract protecting critical areas. This provision reduces the regulatory burden on individuals while making the responsibility for maintaining the critical area tract a collective responsibility. The city would have the ability to enforce requirements for maintenance of the tract.

The Regulatory Alternative provides an exception to the regulations for the small number of cases where strict application of the critical regulations would prohibit development of a site. The existing code contains a similar provision.

The Regulatory Alternative includes new rules for redevelopment that would apply to structures and uses that are already within or near critical areas in cases where there is conflict with the location or design of existing structures. Structures and uses that do not comply with the regulations are referred to as "nonconforming." Under the Regulatory Alternative, rules for redevelopment of nonconforming structures and uses would apply in the following situations:

- Property owners are limited as to what new actions they can take with respect to locating structures, paving, or otherwise disturbing the protected area beyond normal landscaping.
- Expansion of a structure already within a critical area or its setback will be allowed, with specific guidance on the location and amount of expansion allowed. Any expansion closer to the critical area will require mitigation.
- Remodels under a certain threshold that is tied to the value of the structure would be allowed without requiring that the structure be brought into compliance with new regulations. Consideration would be given to those properties that are significantly impacted by the presence of a critical area or its setback.
- Reconstruction following damage or destruction by fire or other sources may trigger compliance with new regulations, potentially using the same value threshold that applies to remodels, or allowing reconstruction in the same footprint within 1 year after destruction.

3.2.2 Geologically Hazardous Areas

The city currently regulates steep slopes, landslide hazard areas, and coal mine hazards. Under the Regulatory Alternative, the current exemption would be maintained for small, isolated slopes inclined at 40 percent or greater. Although this exemption is not explicit in the existing code, current practice exempts isolated slopes when they are 1,000 square feet or less in area and not more than 10 feet in elevation. The exemption allows these slopes to be modified by grading so that they may be developed. Steep slopes associated with stream systems or wetlands are not exempted under this process.

Under the Regulatory Alternative, the Director would have additional flexibility to exempt isolated steep slopes (40 percent or greater) or portions of such slopes between 10 feet and 20 feet in elevation, based upon a critical area report by a geotechnical engineer or licensed engineering geologist in concert with a qualified habitat biologist concludes the area is not wildlife habitat or could be reasonably expected to become wildlife habitat. Steep slopes associated with stream systems or wetlands would not be exempted under this process. No specific exemption is proposed for man-made slopes except as would be allowed by this process.

Additional criteria would be added to the LUC to aid in identification for landslide hazard areas. Under the Regulatory Alternative, the city would incorporate the consideration of additional

factors in identifying landslide hazard areas on slopes less than 40 percent that have a vertical relief of 10 feet or greater. Proposed criteria include (but are not be limited to):

- Areas of historic failures, including those areas designated as Quaternary slumps, earthflows, mudflows, or landslides
- Areas that have shown movement during the Holocene Epoch (past 13,500 years) or that are underlain by landslide deposits
- Slopes that are parallel or subparallel to planes of weakness in subsurface materials
- Slopes exhibiting geomorphologic features indicative of past failures, such as hummocky ground and back-rotated benches on slopes
- Areas with seeps indicating a shallow ground water table on or adjacent to the slope face
- Areas of potential instability because of rapid stream incision, stream bank erosion, and undercutting by wave action.

The Regulatory Alternative would add a new minimum toe-of-slope buffer of 75 feet from slopes of 40 percent or greater or slopes with identified landslide hazard. The 75-foot setback requirement could be modified by a critical areas report prepared by a geotechnical engineer or licensed engineering geologist that approves the location of the proposed development and concludes that risk from potential landslides and slope failure is minimal. Where the landslide hazard is more than moderate, the setback would be based on the potential risk as determined by a geotechnical engineer or engineering geologist.

Under the Regulatory Alternative, the existing section of the code that establishes the method for determining the amount of a site that can be developed when steep slopes are present will be eliminated. The code would be simplified by clarifying a different method for calculating the density allowed on multi-family and commercial lots with critical areas. This would not change the amount of development allowed, just the density allowed outside of the critical area and its buffer. In some cases allowable density outside of the critical area and its buffer would increase and in others it would decrease.

Additional regulations or reporting requirements may be needed with respect to seismic hazards associated with ground shaking, fault rupture, liquefaction, and seiche. At a minimum, a critical areas report prepared by a geotechnical engineer or licensed engineering geologist, and based on geological map analysis and field investigation, would be required to address potential hazards associated with seismic activity.

3.2.3 Frequently Flooded Areas

The city of Bellevue calls "frequently flooded areas" "areas of special flood hazard" to be consistent with FEMA however the areas are defined the same. The Regulatory Alternative establishes a standard to ensure that there would be no rise in flood levels, increasing protection against the risk of off-site flooding resulting from development. Revisions to LUC 20.25H.070 provide greater detail on base flood elevations through proposed revisions to flood insurance studies and Federal Insurance Rate Maps (FIRMs). The coupling of proposed updates to FIRMs (LUC 20.25H.070.A1) would increase protection for floodways. The Regulatory Alternative includes proposed exceptions to restrict use and general requirements to *improve* existing construction located within an area of special flood hazard (LUC 20.25H.110.A).

3.2.4 Streams and Riparian Areas

Under the Regulatory Alternative, the city would adopt the state-created stream typing system, replacing the "A, B, C" system that the city currently uses. The proposed rating system was created by the state, with particular emphasis on the presence of fish in streams. The state stream typing system is based on a multi-parameter model that uses geomorphic parameters such as basin size, gradient, elevation, and other indicators. It was developed based on thousands of field surveys of fish presence and fish habitat.

Adopting the state typing system will bring the city in line with many other jurisdictions in the area and would allow property owners to call on a wider number of consultants to assist in typing streams on their properties. The existing Bellevue-specific typing system is understood by relatively few professionals. The Regulatory Alternative would also increase the width of stream-side buffers for each stream type (see Table 3-1).

Table 3-1. Proposed and existing buffers for streams.

Stream Rating Washington State	Buffer Under the Regulatory Alternative (feet)	Buffer Under Existing LUC (feet)
Type S	100	50
High quality basin	N/A	N/A
Type F	100	50-10
Type N	50	50-25
Type O	25	10-0

Under the Regulatory Alternative, where a legally established right-of-way, railroad right-of-way or other similar infrastructure of a linear nature transects a stream corridor critical area buffer, the edge of the right-of-way will determine the extent of the buffer, if the part of the critical area buffer on the other side of the roadway provides insignificant biological or hydrological function in relation to the portion of the buffer adjacent to the stream corridor. In other words, the buffer

areas would stop at a road or railroad right-of-way if the portion of the buffer cut off by the road or railroad right-of-way provides no significant biological or hydrological functions.

Under the Regulatory Alternative, property owners could propose stream and wetland buffer enhancements, such as increasing native vegetation in the buffer, as mitigation for impacts from a project. Rules allowing modifications to buffer requirements would be clarified and where equal or better results could be obtained by an alternative approach, greater flexibility would be provided for modifying buffer requirements. Flexibility in development standards would also be provided for development outside of stream buffer areas. For example, smaller lot sizes would be allowed and a separate critical area tract could be created through a "conservation subdivision". In existing lots, non-critical area setbacks could be reduced in order to preserve development potential while providing required buffers. This flexibility does not exist in the current LUC.

3.2.5 Wetlands

Under the Regulatory Alternative, the city would adopt the state wetland typing system. This system would replace the existing "A, B, C" system that the city currently uses. The proposed rating system differentiates between wetlands based on their sensitivity to disturbance, their significance, their rarity, the ability to successfully replace them, and the functions they provide. The rating system considers three major groups of functions that wetlands perform (improving water quality, hydrologic function, and wildlife habitat).

Adopting the state typing system would bring the city in line with many other jurisdictions in the area, and will allow property owners to call on a wider number of consultants to assist in typing wetlands on their properties. Similar to the current Bellevue stream-typing system, the existing Bellevue-specific wetland typing system is understood by relatively few professionals. The more detailed methods for assessing wetland functions are divided into 15 different functions (referred to as the "functional assessment"). The level of detail regarding functions found in these assessment methods is not needed for the simpler categorization done in the proposed rating system. The new system simplifies wetland categorization for Bellevue property owners seeking to use the prescriptive regulations for wetlands based on type.

The Regulatory Alternative would also increase the width of wetland buffers for each category of wetland based on scoring used by the state wetland rating system (see Table 3-2).

Under the Regulatory Alternative, property owners would be able to suggest improvements to stream and wetland buffers, for example, enhancing native vegetation in the buffer in return for increased flexibility in the amount and location of development allowed outside of the stream or wetland and its buffer. This flexibility does not exist in the current LUC. Under the Regulatory Alternative, the LUC will contain rules for redevelopment of nonconforming structures and uses similar to those previously described for streams.

Table 3-2. Proposed wetland buffers.

Category	Wetland Characteristic	Buffer
I	Natural Heritage wetlands	190 feet
	Bogs	190 feet
	Forested	Based on score for habitat or water quality functions
	Habitat score of 29 to 36	225 feet
	Habitat score of 20 to 28	110 feet
	Water quality score of 24 to 32 and habitat score of less than 20	75 feet
	Not meeting any of the above	75 feet
II	Habitat score of 29 to 36	225 feet
	Habitat score of 20 to 28	110 feet
	Water quality score of 24 to 32 and habitat score of less than 20	75 feet
	Not meeting any of the above	75 feet
III	Habitat score of 20 to 28 points	110 feet
	Not meeting any of the above	60 feet
IV over 2,500 square feet	Score for functions less than 30 points	40

Development on sites with a wetland or wetland critical area buffer would be subject to increased performance standards for light, noise, runoff, buffer plantings, and pesticide use. These standards will apply to the whole site, even the portion of the site that is not within the critical area.

The Regulatory Alternative establishes new minimum setbacks for structures, measured from the edge of the critical area buffer. For each wetland category, as follows:

Category I wetlands	20 feet
Category II wetlands	20 feet
Category III wetlands	15 feet
Category IV wetlands	none required.

In Bellevue wetlands, the primary setback is the buffer; the structure setback is required to provide outdoor space between the buffer and the structure, because there is usually human activity around a structure. Under the Regulatory Alternative, structure setbacks would be reduced for some wetland areas where the wetland buffers will be increased, resulting in an overall increase in setback relative to the setback under the existing code.

Under the Regulatory Alternative, where a legally established right-of-way, railroad right-of-way or other similar infrastructure of a linear nature transects a stream corridor (or wetland) critical area buffer, the edge of the right-of-way would determine the extent of the buffer, if the part of the critical area buffer on the other side of the roadway provides insignificant biological or

hydrological function in relation to the portion of the buffer adjacent to the stream corridor. In other words, the buffer areas would stop at a road or railroad right-of-way if the portion of the buffer cut off by the road or railroad right-of-way provides no significant biological or hydrological functions.

3.2.6 Shorelines

Under the Regulatory Alternative, the city would adopt prescriptive moorage standards that are in alignment with the Army Corps Regional General Permit (RGP). Because the Army Corps and Washington State Department of Fish and Wildlife (WDFW) each have permitting authority over moorage located waterward of the Ordinary High Water Mark (OHWM), adopting city standards that are consistent with the RGP will streamline the permitting process for citizens. Requirements will include:

- One moorage per parcel or one joint-use moorage for two or more parcels. Newly platted development of two or more dwellings would have joint use moorage where feasible.

- Only piers and ramps would be permitted within the first 30 feet from shore. All floats and ells must be 30 feet waterward of OHWM. No skirting would be allowed on any structure.

- Surface Coverage (includes all floats, ramps, and ells) would be 480 square feet for single property owners; 700 square feet for two property owners (residential); and 1,000 square feet for three or more residential property owners. Widths and lengths will be as follows:

  - Piers: 4 feet wide and fully grated. There is an allowance for 2-foot-wide finger piers.

  - Ramps: Must not exceed a width of 3 feet and must be fully grated.

  - Ells: Must be in water with depths of 9 feet or greater at the landward end of the ell: (a) 6 feet by 20 feet with a 2-foot strip of grating down the center, (b) 6 feet by 26 feet long with grating.

  - Floats: Must be in water with depths of 10 feet or more at the landward end of the float; 6 feet by 20 feet long with a minimum of 2 feet of grating down the center.

  - Piers: The length of the pier is limited by the maximum square footage (surface coverage) allowed (see items above).

Moorage that does not meet prescriptive standards would be considered nonconforming. A critical areas report would be required for those seeking to deviate from the prescriptive moorage standards. Not all prescriptive standards may be modified through the critical areas report process, and an upper threshold would be established for permissible modifications, potentially based on a percentage of the overall value. This approach is consistent with the city's approach to nonconforming structures in other contexts, including in other critical areas.

The Regulatory Alternative establishes new standards that require changes when residential moorage (a dock) is being substantially repaired. Grated decking would be required in the first 30 feet from the shore or the dock would have to be narrowed to 4 feet in width; skirting would have to be removed; and piles within 18 feet of the shore in a yet-to-be-specified depth of water would have to be removed. When less than 50 percent of existing piling is being replaced, similar standards would apply as for dock repair and piles would have to generally be placed as far from shore as possible. For replacement of more than 50 percent of piles, full compliance with the regulations for new docks will be required.

Under the Regulatory Alternative, there would be a shoreline setback of 50 feet. In some circumstances a modification of the buffer may be allowed with mitigation, which would likely include planting appropriate native shoreline vegetation. Such modifications will in no event allow the buffer to be reduced below 25 feet.

The recommended 50-foot setback would apply to all new development, with accommodation made for areas where most existing development does not comply with the 50-foot setback. In the case where a vacant parcel is surrounded by parcels built with a smaller setback, the new development would be allowed to have a setback consistent with that of surrounding parcels, so long as the resulting setback is no closer than 25 feet to the OHWM. This accommodation for existing neighborhood character is similar to the approach taken in some other jurisdictions.

As with other critical areas, expanding the existing shoreline setback would result in some existing structures becoming nonconforming, and the approach to managing these nonconformities under the Regulatory Alternative would be also be similar to that previously described. Following the general principles previously discussed regarding nonconformities associated with stream and wetland critical areas, expansion of existing nonconforming shoreline structures would be allowed, based on a hierarchical approach that would influence the location of any expansion. In all cases, mitigation would be required. Mitigation would likely involve planting the buffer area with native vegetation to offset the impacts of the disturbance in the buffer area.

Under the Regulatory Alternative, development of new bulkheads generally would be prohibited; however, minor repair of existing bulkheads would be allowed. Priority would be given to the use of bioengineered shoreline stabilization techniques that incorporate plant and other natural materials to stabilize the shoreline. However, when a bulkhead fails or other major work is undertaken, the new bulkhead will be required to meet updated standards. Under current code, if a wall fails, it may be replaced.

3.2.7 Wildlife Habitat Conservation Areas

The Regulatory Alternative would add a wildlife habitat overlay to all designated critical areas to ensure wildlife habitat functions and values are considered where current rating systems do not take into account the full range of habitat values (for example, steep slopes or riparian buffers). The objective is to ensure protection of mature upland forest and other critical habitat necessary for sustaining species associated with those habitat types. For example, buffer reductions might not be permitted to the degree otherwise allowed where existing habitat is of high quality (e.g., mature conifers in slope setbacks, mature trees in stream buffers). This would be especially true if the slope below was also fully forested. Special management plans may also be required where a priority species is nesting or utilizing habitat on a regular basis. The proposed LUC would include a series of incentives that will promote retention of the large blocks of remaining forest canopy that are not already contained in critical areas. Targeted areas would include upland forested slopes of 25 to 40 percent with limited development potential. Incentives would be designed to encourage forms of development that include a high degree of lot clustering; aggregated vegetation retention; and special development standards and low impact development techniques to conserve native forested species and retain forested areas for recreational and aesthetic purposes.

The Regulatory Alternative would add to the LUC a package of incentives aimed at preserving habitat linkages between patches of habitat and other isolated natural areas, parks, preserves, open spaces, or large tracts. These wildlife corridors facilitate movement of animals between essential breeding, feeding, and roosting habitat while helping to minimize negative effects of urbanization. The development of wildlife corridors may also provide opportunities for needed recreational linkages and provide needed buffering between adjoining neighborhoods and uses.

Under the Regulatory Alternative, both city and private development projects would apply science-based management recommendations to mitigation projects for special status species in Bellevue. Up to 23 special status species may be present at this time in Bellevue; of these, 13 are known to reside and breed in the city. Most of these species are birds (e.g., bald eagle, peregrine falcon, common loon, pileated woodpecker, Vaux's swift, merlin, red-tailed hawk), but there also are five mammals, some amphibians and reptiles, and four fish species (Chinook salmon, coho salmon, bull trout, and river lamprey). With the exception of the fish and a few water birds, most in the list are associated, or closely associated, with all of the non-urban habitat types in Bellevue: upland conifer-hardwood forests, riparian areas, herbaceous wetlands, open water, and pasture land.

Under the Regulatory Alternative, when a proposal occurs on a site with species of local importance, an applicant would be required to submit a Habitat Management Plan that documents how the proposal will avoid or mitigate impact to the habitat or species in question. The plan must address species distribution, habitat requirements, limiting factors, specific management recommendations, and key relationships between habitat requirements and management recommendations. Special monitoring and adaptive management may be required as well. Application of this provision will require initial biological review prior to submittal to determine whether a special status species exists on the site.

3.3 City Programs Alternative

The City Programs Alternative assumes that the major component of the city's response to the Growth Management Act (GMA) requirement to update critical area policies and regulations considering best available science will consist of programs and investments focused on preventing further degradation of Bellevue's critical areas. Under the City Programs Alternative, it is assumed that the city would increase the magnitude of effort above current levels for city programs and investments in critical areas.

These programs and investments would be undertaken by the city, in lieu of making substantial amendments to the city's existing critical area regulations in LUC Part 20.25H. The existing LUC, as it pertains to critical areas for streams, wetlands, shorelines, and wildlife, would be maintained under the City Programs Alternative. The City Programs Alternative does not contain programs or investments targeted at geological hazards, and it is assumed that the city would amend the regulations in LUC Part 20.25H that pertain to geologically hazardous areas, as outlined under the Regulatory Alternative, to protect these critical areas under the City Programs Alternative. A comprehensive description of the City Programs Alternative is contained in Appendix B.

The City Programs Alternative includes four major categories of programs and investments:

- Acquisition
- Rehabilitation/Maintenance
- Education/Stewardship
- Monitoring.

Table 3-3 provides details about the focus of the four categories. It also provides examples of the programs proposed under each category for streams, wetlands, shorelines, and wildlife, and an assumed level of investment or target to be achieved through the programs over time. The programs in these four categories would be prioritized and some, but not necessarily all of the programs, would be implemented over time (not all in the first year or two and not all every year) to improve protection of Bellevue's critical areas over the long term.

3.3.1 Acquisition

Through the acquisition program, the city could acquire up to approximately 13 acres of shoreline and associated buffer areas (Lake Washington and Lake Sammamish), 30 acres of wetland and wetland buffer areas, 207 acres of stream and stream buffer areas. In addition, conservation easements would be established in wetland areas and less developed basins (for example, Goff Creek/Richards Creek).

Table 3-3. City Programs Alternative.

Category	Program	Purpose/Goal	Level of Investment	Target
Acquisition	Stream acquisition. Wetlands acquisition. Shoreline acquisition.	Replace over time the acreage that would have been regulated by expanded buffers; focus on connectivity to also serve wildlife function.	As necessary to meet target over redevelopment timeframe of 50 years.	207 acres 30 acres Lake Sammamish – 5.89 acres Lake Washington – 7.35 acres
Rehabilitation/ Maintenance	Projects under this element of the City Programs Alternative include: ▪ Streamside buffer, wetland, wetland buffer and shoreline rehabilitation projects (i.e., enhanced native plantings, removal of invasive species, removal of hardened shorelines) designed to maintain or enhance existing functions and values on property owned or controlled by the city; ▪ In-stream enhancement projects (i.e., placement of large woody debris; removal of fine sediments); ▪ Fish passage barrier removal; ▪ Water quality improvement projects.	▪ Improve function of property in city ownership, and as acquired over time. Once rehabilitation projects performed, include sufficient maintenance dollars to retain value of the project over time; ▪ Improve in-stream habitat and remove fish barriers; ▪ Improve/maintain water quality and respond to flood control issues as needed.	Total amount available: ▪ $1,493,000 annually; allocated as follows: ▪ Stormwater catchbasin cleaning – $445,000. ▪ Oil/water separator maintenance – $8,000. ▪ Remainder ($1,040,000) to be allocated among critical areas based on assessment of risk to particular area if development regulations are not amended.	
Education/Stewardship	Efforts within this aspect of the City Programs Alternative include: ▪ Private stewardship programs (efforts to encourage and offset costs for rehabilitation of critical areas on private property). Includes money for native plantings and technical assistance for rehabilitation projects. ▪ Education programs to educate critical area property owners and general citizenry about values of critical areas; school and community outreach programs; and volunteer coordination programs to assist with planned public or private rehabilitation projects.	▪ Increase incentives for private property owners to better manage the critical areas on their property. Includes city-provided technical assistance, native plant materials, and waived permit fees. ▪ Continue community education and outreach to maintain interest in and support for city's environmental stewardship efforts.	Total amount available: $1,028,000 annually, allocated as follows: ▪ Private stewardship programs – $514,000. ▪ Education programs – $514,000.	

Table 3-3 (continued). City Programs Alternative.

Category	Program	Purpose/Goal	Level of Investment	Target
Monitoring	Monitoring program to include the following elements. Monitoring scale and timeline for each indicator to be established. Monitoring results will be used to improve effectiveness of city programs. Streams ▪ Velocities ▪ Buffer widths and contiguity ▪ Biological sampling (diatoms or benthic index) ▪ Temperature. Wetlands ▪ Inventory and type city-owned ▪ Gather data from new typed privately-owned ▪ Biological sampling ▪ Buffer widths and contiguity. Shorelines ▪ Prepare shorelines inventory required for Shoreline Management Act update. Wildlife (upland habitat) ▪ Prepare landscape analysis focusing on connectivity. Other ▪ Retain and track utilization data for education and stewardship programs.	Establish key baselines to assess effectiveness of the City Programs Alternative over time; will provide information for next required critical areas update.	As necessary to fund described program.	

3.3.2 Rehabilitation/Maintenance

The rehabilitation/maintenance element would increase the level of investment in wetland, wetland and streamside buffers, and shoreline rehabilitation projects, such as removing invasive plants and replanting with native species, or replacing hardened shoreline armoring with bioengineered structures. Capital improvement spending to provide or improve fish passage would increase relative to current levels, as would spending for stream channel modification capital improvement projects (CIP) (for example, large woody debris installations, and erosion/sediment control projects). Several drainage and stormwater management and maintenance activities would increase over current levels, including the annual cleaning of stormwater catch basins and oil/water separators.

3.3.3 Education/Stewardship

Under the City Programs Alternative, the city would initiate or increase its current level of effort for stewardship, education, and outreach activities, many with an action component to involve schools, neighborhoods, and businesses in the protection and rehabilitation of streams, wetlands, and shorelines. In addition to raising awareness of the values of critical areas in property owners and the general public, these programs would engage volunteers in a broad array of planned public or private rehabilitation activities, ranging from reducing invasive non-native plants to controlling sources of water pollution.

3.3.4 Monitoring

The city would develop and implement a monitoring program for streams, wetlands, shorelines and wildlife. The monitoring program would also track use of the education and stewardship programs. Shorelines and city-owned wetlands would be inventoried, and landscape analysis would be performed, focusing on wildlife habitat connectivity. In addition to establishing key baseline data, the monitoring program will provide data for guiding future actions (adaptive management plan), for example, through an investigation of stream buffer width conditions to identify those leading to improvements in water temperature for streams. The monitoring program could supplant fixed buffer sizes with variable buffer widths determined on a site-specific basis.

3.4 BAS Based Alternative

The fourth alternative is called the BAS Based Alternative and is a set of recommendations that resulted from a literature review of the best available science for protecting critical area functions in the city of Bellevue (Herrera 2005). The set of recommendations are detailed for individual

critical areas within each section. The BAS Based Alternative is designed to improve protection of the functions and values of critical areas and not just maintain them.

3.4.1 Geologic Hazards

All five of the geologic hazards specified in the Growth Management Act (i.e., seismic, erosion, landslide, volcanic, and coal mine hazard areas) as well as frequently flooded areas have the potential to adversely affect Bellevue's community functions and impair the value of human life and property. A review of the best available science indicates ground shaking caused by earthquakes is the most serious hazard in Bellevue in terms of the potential for widespread damage and loss of life. However, the likelihood of a significant event in the near future is uncertain due to limited seismic information about regional faults and data related to the dynamic properties of geologic materials.

The following actions would be consistent with best available science for protecting public health and safety in areas that are geological hazards and frequently flooded areas:

- Site-specific investigations of geologic conditions are required to delineate erosion and landslide hazards at the resolution necessary to mitigate most hazards. The city's delineation of erosion and landslide hazard areas should be updated by incorporating historical records and new light ranging and detection (lidar) topography into the erosion and landsliding models that rate susceptibility to erosion or landsliding in terms of several relative hazard classes. The highest hazard rating should be used to determine structure setbacks in areas where site-specific investigations have not been performed.

- The city is located within 160 km (99 mi) of five active volcanoes. The uncertainty related to whether ash fall from future volcanic eruptions will affect Bellevue complicates the feasibility of mitigating hazards due to volcanic eruptions.

- Although the city's inventory of abandoned coal mines is based on historic mining information and not site specific investigations, the delineation of broad areas suspected of posing coal mine hazards provides a margin of safety for the hazards posed by the collapse of abandoned coal mines.

- While it may not be economically feasible to retrofit or relocate all existing structures that are now within geologically hazardous areas, at minimum, the risks to critical facilities should be reviewed and appropriate measures implemented to protect public safety. Risks posed by geologic hazards can be best mitigated by restricting new development in vulnerable areas.

3.4.2 Frequently Flooded Areas

- Use the most recent LIDAR topographic maps for any future update of existing flood hazard maps.
- Address increases in peak flow anticipated as a result of basin urbanization in any future flood hazard mapping. Hydrologic modeling should also consider projected changes in precipitation related to climate change.
- Consider new flood control projects that emulate natural stream processes.
- Implement public buy-out or land-stewardship programs to restore the ecological functions of frequently flooded areas.

3.4.3 Streams and Riparian Areas

Table 3-4 summarizes the recommendations resulting from the review of best available science for protecting stream and riparian area functions and values.

3.4.4 Wetlands

Table 3-5 summarizes the recommendations resulting from the review of best available science for protecting wetland functions and values.

3.4.5 Shorelines

Table 3-6 summarizes the recommendations resulting from the review of best available science for protecting shoreline functions and values.

In order to achieve ecological success, any rehabilitation and preservation actions will provide more benefits if implemented at the watershed scale and not just within Bellevue's city limits. Nonetheless, given the current state of habitat degradation, all protection and rehabilitation efforts will contribute to the overall improvement of the natural resource and recreational functions and values that the city's lakes provide.

The existing Bellevue LUC (Chapter 20.50, Definitions) defines critical areas as areas designated by LUC 20.25H.070 where use or development is subject to special limitations due to its physical characteristics. Shorelines are currently not included as a critical area. The Bellevue LUC also does not differentiate and define the ecological characteristics of the shoreline, buffer, and structure setback areas. These differentiations and definitions would help facilitate public understanding of the specific functions provided by each of these areas and their role in protecting Bellevue's shorelines. This could be accomplished by amending the city of Bellevue critical areas regulations to include definitions of shoreline riparian area, shoreline buffer, and protective structure setback.

Table 3-4. Summary of best available science findings and general recommendations for protecting streams.

Protection Mechanism	Best Available Science Review	General Recommendations
Adopt a stream typing system to address processes that are relevant to specific types of streams and fish habitat.	The DNR water typing system considers fish habitat rather than presence or absence of fish species.	Adopt the DNR stream typing system.
Implement riparian structure setbacks which protect an area of sufficient size to provide riparian and aquatic processes and functions, protect riparian species, and buffer against development impacts.	The effectiveness of a buffer to provide multiple functions and benefits is linked to its width and other facts such as slope, vegetation characteristics, soil type, buffer design and buffer management. Many of the critical functions of riparian zones occur in those areas directly adjacent to streams and plateaus at a given distance. Buffer width established using the site potential tree height (SPTH) concept can provide the ecological functions necessary to support salmonids and most riparian and aquatic functions and processes.	The developed character of the city makes adoption of fully protective buffers impractical therefore adoption of buffers that provide the greatest riparian functionality is advised. Measure riparian structure setbacks from the channel migration zone or ordinary high water mark.
Provide stewardship programs as incentives to restore and protect riparian functions where stream buffers are not possible.	Processes and functions provided in the literature for buffers are based on areas vegetated with native plant species at densities of native plant communities. Sparsely vegetated or vegetated buffers with non-native species may not perform the needed functions of stream buffers.	Educate landowners on the importance of protecting and maintaining stream buffers. The city should provide partnerships with landowners for riparian restoration projects.
Increase the distance between human activities and stream buffers.	High-density residential, commercial, and industrial land-uses often necessitate wider structure setbacks from aquatic ecosystems to better protect streams from the higher levels of disturbances associated with more intensive land uses.	A 25-foot structural setback to stream buffers along all water types is preferred when possible to prevent disturbance of riparian functions.
Restore fish habitat and passage by daylighting stream segments.	The primary technical elements to consider when restoring a channel to the surface are channel design and floodplain.	Establish piped stream buffers based on buffer widths meeting the SPTH concept and, when possible include a 25-foot structural setback. The preserved land area will provide space for daylighting a stream segment. The developed character of the city may preclude this protective mechanism in many areas.
Implement restoration and enhancement strategies to improve or prevent additional degradation of riparian habitat.	Watershed-based strategies that address hydrology, water quality, and riparian functions are the most successful in addressing riparian areas and adequate buffers in the context of basin-wide change.	Restore degraded riparian areas using strategies which emphasize the whole watershed and ecological processes which include the following: ▪ Design and install LWD ▪ Plant native coniferous trees along streams ▪ Reduce invasive non-native plants along streams ▪ Replace or modify culverts which prevent fish passage ▪ Restore and enhance wetlands to restore off-channel habitat.

Table 3-5. Summary of best available science findings and general recommendations for protecting wetlands.

Protection Mechanism	Best Available Science Review	General Recommendations
Basing wetlands protection on wetland size	Wetland size may be a factor but is not a determinant of the functions and values provided by a wetland.	Provide protection for wetlands commensurate with wetland functions.
Measuring the functions of wetlands.	▪ The most useful methods generate parametric measures rather than general rankings. ▪ Require the same method be used to evaluate functions for wetland losses and for wetland mitigation proposals. ▪ Specify the use of wetland functional assessment methods that are appropriate to Bellevue's wetland types to improve mitigation success and provide a consistent database for monitoring and analysis.	Most Bellevue wetlands are either riparian or depressional palustrine wetlands. Hruby et al. (1999) provides methods producing parametric measures of function that are suited to the types of wetlands located in Bellevue.
Rating wetlands as a basis for more protective regulations.	The primary factors important to consider when rating wetlands for the purposed of applying commensurate protective measures are : ▪ Rarity ▪ Ability to replace it ▪ Sensitivity to disturbance ▪ Functions performed by the wetland.	Ecology (Hruby 2004) provides a wetland rating system that rates wetlands on specific criteria including, rarity, sensitivity to disturbance, and functions.
Providing protective buffers for wetlands.	▪ In urban areas, a minimum of 100 feet of buffer is necessary to provide significant water quality protection and minimal wildlife habitat protection for wetlands. ▪ Additional protection for wildlife can be achieved with wider buffers and/or increased landscape connectivity.	▪ Provide a minimum of 100 feet of buffer for all Class A, B, or C wetlands in Bellevue that are rated a Category I, II, or III using Hruby (2004). ▪ Where possible, provide a minimum 200 foot buffer for those wetlands rated as a Category II or II by Hruby (2004). ▪ The developed character of the city may preclude the practical implementation of larger buffers; therefore, the city should explore alternative strategies to increase wetland protection such as improving the connectivity of native habitat in the landscape.
Allowing for the use of buffer averaging.	The effectiveness of buffer averaging in achieving equal or increased wetland protection has not been studied and is unknown.	Allow buffer averaging when averaging will improve connectivity with adjacent native habitat.

Table 3-5 (continued). Summary of best available science findings and general recommendations for protecting wetlands.

Protection Mechanism	Best Available Science Review	General Recommendations
Allowing wetland creation, restoration, enhancement and permanent protection as mitigation for wetland losses.	▪ Mitigation in general for wetland losses has achieved a poor rate of success to date, particularly wetland creation. ▪ Enhancement of wetlands in exchange for permanent loss of wetland area fails to compensate for lost wetland area and frequently fails to improve wetland functions. ▪ Allowing permanent protection of wetlands in exchange for permanent loss of wetland area fails to compensate for lost wetland area or wetland functions. ▪ Regulatory follow-up is vital to ensuring the success of wetland mitigation.	▪ Improve the instructions for applying to mitigate, from avoidance and minimization to submitting a monitoring report for a compensation wetland. ▪ Adjust replacement ratios to reflect functional losses as well as areal losses. ▪ Avoid accepting wetland enhancement or protection of wetlands in exchange for wetland losses. ▪ Increase regulatory follow-up and enforcement of compensatory mitigation projects; develop and maintain a database and filing system; allocate staff to perform compliance and enforcement activities; and implement reviews of regulatory program performance.
Improve water quality discharging to wetlands	▪ Wetland water quality fundamentally affects aquatic habitat for wetland dependent species.	▪ Improve regulatory controls for protecting water discharging to wetlands. ▪ Improve maintenance of existing stormwater facilities. ▪ Implement educational and stewardship programs directed towards reducing point and non-point source pollutants. ▪ Implement mitigation projects to reduce water level fluctuations in valued wetlands.

Table 3-6. Summary of best available science findings and general recommendations for protecting shorelines.

Protection Mechanism	Best Available Science Review	General Recommendations
Acknowledge shoreline areas as critical areas.	To be protected, it first needs to be defined and characterized. The Bellevue LUC does not clearly differentiate and define shorelines or characteristics of riparian, buffer, and structure setback areas, particularly within the context of the ecological functions they provide to the shorelines.	Add the shorelines as protected areas. Characterize habitat conditions and current degree of shoreline development along Bellevue's Lake Washington, Lake Sammamish, and Phantom Lake.
Create buffers which protect an area of sufficient size to provide shoreline riparian and aquatic processes and functions.	Regulatory buffer areas ranging from 50- to 100-foot-wide ("no touch" buffer) may be adequate to provide for the functions of Bellevue's lake shorelines. However, this adequacy is closely linked to its general conditions (i.e., whether it is disturbed or developed versus covered in native herbaceous, shrub and tree vegetation as well as width). For a shoreline buffer area to function properly it must be undisturbed.	Perform lake-specific studies to evaluate the minimum buffer width requirements needed to provide for and maintain shoreline functions and values. Allow a buffer area of variable width (buffer averaging) to offer a feasible approach to help achieve adequate buffer functions. Buffer averaging provides greater flexibility to achieve the desired ecological goals, but a minimum width of 35 feet from the lake edge should be maintained. Require a monitoring plan to report the success of created or enhanced buffer areas.
Implement specific regulations for structure setbacks.	A 25-foot-wide protective area measured from the edge of the shoreline buffer and called a structure setback is most often recommended.	A structure setback to protect the shoreline buffer is needed in order to prevent disturbance of the riparian functions that are integral to the shorelines of Lake Washington, Lake Sammamish, and Phantom Lake. It is recommended that the shoreline buffer be measured from the OHWM and the 25-foot-wide structure setback be measured from the edge of the shoreline buffer. The OHWM should be defined based on an actual topographic elevation rather than a series of biological indicators along the shoreline.
Implement specific regulations for shoreline armoring and vegetation conservation activities.	Bulkhead maintenance or construction may result in the loss of: 1) organic material (e.g., tree litter, large woody debris, and insects) to the lakes littoral zone; 2) shade to lake's fringe habitat; 3) physical aquatic and terrestrial habitat; and 4) sediment contribution. In addition, species responses (typically associated with the habitat responses) are also triggered, including changes in the food web, salmonid fish habitat utilization and migration patterns, and predator-prey interactions.	Consider for removal or replacement (with vegetative and large woody debris structures) bulkheads needing any type of maintenance, repair, and/or retrofitting. If a complete removal is not feasible, relocate the bulkheads landward of the OHWM, and restore the shoreline with emergent and riparian plant species. There are instances where both a bulkhead and fill currently occur below the official OHWM elevation, and where the geomorphic configuration of the shoreline has been straightened, thereby eliminating natural convolution. In those instances, and in order to restore the natural shoreline configuration, it is recommended that the bulkhead replacement be accompanied by a geomorphic reconfiguration of the shoreline.

Table 3-6 (continued). Summary of best available science findings and general recommendations for protecting shorelines.

Protection Mechanism	Best Available Science Review	General Recommendations
Implement specific regulations for shoreline armoring and vegetation conservation activities (continued).		Additional recommendations: ▪ Investigate the effectiveness of alternative shoreline armoring (bioengineering) techniques through the use of prototype bulkheads. ▪ Investigate the effectiveness of supplemental beach nourishment as a restoration measure. ▪ Require a monitoring plan to evaluate the success of areas stabilized through the use of bioengineering techniques. ▪ If possible, impose or request a voluntary no-wake zone along all shorelines in a zone extending from the OHWM to 300 feet offshore to minimize wake erosion effects on the shoreline. ▪ Do not allow the construction of new breakwaters, jetties, and groins.
Implement specific regulations for moorage activities.	Over-water structures (i.e., docks, piers, boathouses, and floats) degrade habitat and habitat functions that support anadromous fish species, particularly salmon. The construction of over-water structures in Lake Washington and Lake Sammamish has increasingly eliminated shallow-water habitat, particularly affecting juvenile Chinook salmon. Over-water structures may displace or degrade some normal habitat functions within their footprints. Over-water structures also generate indirect impacts through modifying aquatic habitat features.	New in- or over-water structures should not be allowed on Bellevue's Lake Washington, Lake Sammamish, and Phantom Lake shorelines. This restriction is needed in order to stop the loss of shoreline areas and functions. In any event, compliance with the U.S. Army Corps of Engineers Regional General Permit should be required if in- or over-water structures are allowed, or for existing structures requiring retrofitting or maintenance. Cumulative effect analysis should be required as part of permitting in- or over-water structures. Studies are needed to specifically examine salmon mortality due to predation associated with over-water structures in Lake Washington and Lake Sammamish. Studies are also needed to characterize the existing habitat conditions and the degree of shoreline development in Phantom Lake.

Lake-specific literature on buffer width is almost nonexistent, and the few available sources that provide information on buffer functions as a factor of buffer width focus on protecting water quality in lakes. Following are recommendations for buffers along shorelines in Bellevue:

- Based on the literature review, a shoreline buffer ranging from 50 to 100 feet wide may be adequate to protect the ecological functions of Bellevue's lake shorelines.

- A structure setback to protect the shoreline buffer is recommended to maintain and protect shoreline functions occurring in the buffer. The structure setback to prevent disturbance of the riparian functions that are integral to the shorelines of Lake Washington, Lake Sammamish, and Phantom Lake.

- A 25-foot-wide protective structure setback measured from the edge of the shoreline buffer is most often recommended.

- The 25-foot-wide setback would only limit structures. Lawns and gardens may be allowed within the 25-foot-wide structure setback as long as maintenance activities do not adversely affect the shoreline buffer or the functions it provides.

- Within the combined protective buffer/structure setback area, to the extent possible, provide habitat connectivity along the entire length of the shoreline. In addition, include tree, shrub, herbaceous, and emergent layers of vegetation in order to obtain a full range of buffer functions.

- Shoreline buffer averaging may be allowed. However, include a minimum width of 35 feet from the OHWM to ensure recruitment of large woody debris.

- If possible, a voluntary or imposed no-wake zone designated along all shorelines within a zone extending from the ordinary high water mark to 300 feet offshore in Lake Washington and Lake Sammamish would substantially improve shoreline habitat protection.

- A speed limit for Phantom Lake (if motor boat use is currently allowed) would improve protection of the lake's habitat.

These recommendations would apply to all the following developmental activities: agricultural uses, clearing and grading, commercial development, residential development, and design and construction of roads, railroads, and other essential public utilities.

Few studies have addressed the environmental effect of bulkheads in freshwater environments, particularly in Lake Washington, Lake Sammamish, and Phantom Lake. The available data

indicate that the greatest potential for bulkhead impacts relates to shoreline aquatic and riparian habitat and species, particularly salmonids. Impacts include elimination of shallow water habitat and complex habitat features; reduction in the abundance of overhanging vegetation, other shoreline vegetation, and large woody debris; interruption of the sediment nourishment and transport processes; reduction of fine sediment; and changes in behavior of juvenile Chinook salmon. Following are recommendations for managing bulkheads in Bellevue:

- Consider replacing bulkheads needing any type of maintenance, repair, or retrofitting with shoreline protection alternatives that include vegetation and large woody debris. This recommendation is based on a conservative interpretation of the best available science. If complete removal is not feasible, relocate the bulkheads landward of the ordinary high water mark, and restore the shoreline with emergent and riparian plant species. The latter would represent a less conservative interpretation of what is indicated by the best available science to stop the loss of shoreline area and functions.

- Where bulkheads are removed, consider preventing shoreline erosion through marsh creation (using bioengineering). Marsh plants dissipate wave energy and stabilize shoreline sediments. The exposed stems of marsh plants (e.g., emergent vegetation) form flexible masses that dissipate energy.

- Structural bioengineering techniques should be tested as alternatives for shoreline stabilization and restoration. This includes the implementation of bioengineered and through the use of prototype armoring structures (i.e., "prototype bulkheads"). Concurrent beach nourishment activities could be implemented in those areas where existing bulkheads have caused beach erosion. These restoration actions should focus on evaluating potential solutions for reducing upper beach loss along armored shorelines by increasing the elevation at which bulkheads are built and roughening the structures to dissipate wave and boat wake energy and trap sediment.

- Monitoring should be required to evaluate the success of areas stabilized through the use of bioengineering techniques.

The physical alterations caused by structures that dissipate the energy of waves and boat wakes, (such as breakwaters, jetties, and groins) dramatically alter the structure and functions of habitats at the site where they are constructed. These habitat alterations primarily consist of physical aquatic habitat loss at the placement site and a modification of the substrate characteristics in immediately adjacent areas due to the alteration of the sediment transport process. Following are recommendations for addressing breakwaters, jetties, and groins in Bellevue:

- Avoid construction of any new breakwaters, jetties, and groins.

- Consider removing existing breakwaters, jetties, and groins needing maintenance, repair, or retrofitting, particularly within the littoral area.

- Where such structures are removed, energy dissipation for waves and wakes (if that was the function of the structure) could be achieved through marsh creation.

Moorage-related structures (e.g., docks and piers) alter the habitat structure in the littoral zone, promoting physical, chemical, and biological changes that eliminate or diminish ecological functions and values. Such structures can alter currents, the amount and transport rates of shoreline sediment and woody debris, changes in nighttime ambient light levels (developed areas are often much brighter at night due to lighting), introductions of toxic chemicals, and reductions in the quantity and quality of habitat. Following are recommendations for in- and over-water structures in Bellevue:

- Consider not allowing new in- or over-water structures on the shorelines of Lake Washington, Lake Sammamish, and Phantom Lake in Bellevue. This restriction is needed in order to stem the loss of shoreline area and functions.

- Develop incentives to reduce in- and over-water coverage, number of piles, and shoreline area occupied by piers and docks.

- The net reduction may be achieved by reducing the size of docks, piers, boathouses, and floats for structures that exceed the current code specifications (i.e., those with a nonconforming status).

- Request that in- or over-water structures requiring retrofitting or maintenance comply with the U.S. Army Corps of Engineers Regional General Permit requirements. The Regional General Permit (USACE undated) provides construction specifications and conservation measures designed to reduce the effects of construction of new or expansion of existing residential over-water structures and/or drive moorage piling to provide water access and boat moorage. A determination of the cumulative effect is a recommended part of the permitting process.

- Finally, encourage that studies be done to examine salmon mortality due to predation associated with over-water structures in Lake Washington and Lake Sammamish. A study is also needed to characterize the existing habitat conditions and degree of shoreline development in Phantom Lake that could serve as a basis for adapting the general recommendations provided in this report to specific needs and conditions of Phantom Lake.

3.4.6 Wildlife Habitat Conservation Areas

The following section summarizes the recommendations resulting from the review of best available science for protecting the functions and values of wildlife habitat conservation areas.

In the literature, there are two approaches for conserving species and their habitat. One approach is to protect species only within clearly identified ecological reserves (i.e., tracts of land, often large) that are relatively homogenous in terms of plant composition and structure regardless of the adjoining land use. The other approach attempts to protect species throughout an entire region by enhancing the quality of existing habitat and by providing for all important wildlife needs. This regional approach is more difficult to implement. Implicit in both approaches is the protection of ecological function, composition, and structure. Such approaches are more difficult to implement in urban environments than in large forested areas and more natural landscapes. Nevertheless, land use regulation through ordinance rules and zoning and comprehensive plan policies that guide property acquisitions and stewardship programs for habitat protection can minimize the detrimental effects on wildlife.

Wildlife habitat types and the locations of many species of concern in Bellevue are documented; however, the information could be made more helpful by prioritizing the protection of specific habitat areas in Bellevue based on their value to wildlife in the city.

- Aquatic and riparian areas can be protected through the critical areas regulations for wetlands, streams and frequently flooded areas.
- The habitats required by the special status species identified in Bellevue's wildlife inventory should be protected when they are identified on a site.
- The state or federal protection requirements for the breeding habitats of special status species should be considered in site planning, including the use of buffers and restrictions on land use activities.
- The city of Bellevue could improve wildlife habitat conservation by identifying remaining vegetated corridors throughout the city that can be further linked with high-quality streams, wetlands, and open space lands. The goal of the network is to protect larger core wildlife habitats that still remain in the landscape and maximize connected areas of native habitat between them.
- The city of Bellevue could additionally improve the condition and extent of wildlife habitat within the city by developing stewardship programs that focus on education and incentives for landowners who retain areas of native vegetation and provide opportunities for wildlife.
- The city of Bellevue could acquire conservation easements on properties identified as having high-value wildlife habitat in order to protect those areas in perpetuity.

The city of Bellevue's provisions for buffers to protect aquatic habitat, such as streams, water bodies, and wetlands, are an important element of wildlife habitat protection. For many terrestrial species, wetlands provide water for drinking and vegetation for food and cover. Buffers around lakes, streams, and wetlands provide a number of benefits to aquatic and terrestrial wildlife including breeding and cover habitat for invertebrates and wildlife with small home ranges.

4.0 Environmental Conditions and Risk Analysis for Geologic Hazards and Frequently Flooded Areas

The following sections describe the analysis results related to protecting public health and safety within geological hazards and frequently flooded areas. Note that the city of Bellevue identifies frequently flooded areas as "areas of special flood hazard" within their existing regulations and in the proposed Regulatory Alternative; however, areas of special flood hazard are the same as frequently flooded areas. Table 4-1 shows the indicators selected for each geologic hazard and for frequently flooded areas and defines what is considered properly protected and not properly protected. The results of the analysis of risk to public health and safety conditions are summarized in Table 4-2 and discussed in the following section. There are no city programs addressing geologic hazards and frequently flooded areas; therefore, the Regulatory and City Programs alternatives are combined for those critical areas. The alternatives evaluated in this section include the No Action, Regulatory Alternative/City Programs Alternative and the BAS Based Alternative.

4.1 Ground Shaking

Most buildings in Bellevue are relatively new and were constructed to earthquake codes. Capital improvement programs are underway to retrofit city buildings, bridges, and other essential public facilities (as defined by LUC 20.50.018 and RCW 36.70A.200) that were constructed to earlier earthquake codes. In addition, new construction must meet the seismic building standards in the 2003 International Building Code (IBC) adopted in 2004 by the State of Washington. Given the low recurrence interval of earthquakes on the Seattle Fault and costs required to mitigate all hazards, existing conditions are considered properly protected with respect to ground shaking.

No Action Alternative: Ground shaking is not addressed by the No Action Alternative. The No Action Alternative will have a neutral effect on public health and safety in both the near term and long term. The No Action Alternative will maintain existing properly protected conditions.

Regulatory Alternative/City Programs Alternative: Ground shaking is not addressed by the Regulatory Alternative. The Regulatory Alternative will have a neutral effect on public health and safety in both the near term and long term. The Regulatory Alternative will maintain existing properly protected conditions.

BAS Based Alternative: The BAS Based Alternative recommends that the risks to all existing structures, particularly critical facilities, within geologically hazardous areas should be reviewed and appropriate measures implemented to protect public safety. Risks posed by geologic hazards can be best mitigated by restricting new development in vulnerable areas. The city is already engaged in some of these activities; therefore, the BAS Based Alternative would maintain existing conditions for public health and safety in both the near and long term.

Table 4-1. Geologic hazards and frequently flooded areas criteria matrix.

Geologic Hazard	Indicators	Public Health and Safety	
		Properly Protected	Not Properly Protected
Ground Shaking	Construction Standards	Essential public facilities [a] are capable of withstanding earthquake loads from the peak ground acceleration. [b]	Construction standards do not adequately protect the function of essential public facilities from earthquake loads.
Surface Rupture	Location of Essential Public Facilities	Essential public facilities are not located on active segments of the Seattle Fault. Setbacks are required for new construction.	Some essential public facilities are located in areas subject to surface rupture of segments of the Seattle Fault.
Liquefaction	Location of Essential Public Facilities	Essential public facilities are not located in areas prone to liquefaction.	Some essential public facilities are located in areas prone to liquefaction.
Tsunami/Seiche	Setbacks and Construction Standards	Essential public facilities are located above areas of potential tsunami inundation or are capable of withstanding impacts from inundation.	Impacts to essential public facilities located in areas of potential tsunami inundation are not mitigated.
Erosion	Soil loss and sedimentation	Surface erosion from disturbed areas is controlled and contained on site.	Erosion causes rills or gullies. Eroded sediment is released to adjacent property or water body.
Landsliding	Setbacks from top and toe of steep slopes	New construction follows setback rating based on geologic conditions and slope height	Does not meet standards for properly protected.
Volcanic Eruption	Planning for impacts of an ash-fall event	The protection of essential facilities from ash-fall hazards is addressed in an emergency response plan.	Ash-fall hazards are not addressed in an emergency response plan.
Coal Mines	Construction Standards	Construction standards required to mitigate hazards from potential ground subsidence.	Does not meet standards for properly protected.
Flooding	Construction Standards	Essential public facilities are not located in frequently flooded areas. Setbacks and elevation above base flood required for new construction.	The function of some essential public facilities located within frequently flooded areas is significantly impacted by flooding.
	Floodway Condition	Basin development does not increase the base flood elevation.	Basin development significantly increases the base flood elevation.
	Channel Migration	Setbacks include zones of potential channel migration.	Setbacks do not include zones of potential channel migration.

[a] RCW 36.70A.200 (1) defines essential public facilities as those facilities that are typically difficult to site, such as airports, state education facilities and state or regional transportation facilities as defined in RCW 47.06.140, state and local correctional facilities, solid waste handling facilities, and in-patient facilities including substance abuse facilities, mental health facilities, group homes, and secure community transition facilities as defined in RCW 71.09.020. Hospitals, fire stations, power plants, treatment plants, hazardous material facilities, bridges, and pipelines may also require the same protection as essential public facilities.

[b] The peak ground acceleration, as defined by the 2003 International Building Code (IBC).

Table 4-2. Geologic hazards and frequently flooded areas environmental conditions and risk analysis matrix.

Geologic Hazards and Indicators		Public Health and Safety Baseline Conditions		Risk Analysis Results											
				No Action Alternative				Regulatory Alternative/ City Program Alternative				BAS Based Alternative			
Hazard	Indicators	Properly Protected	Not Properly Protected	PPC	NPC	N	U	PPC	NPC	N	U	PPC	NPC	N	U
Ground Shaking	Construction Standards	X				NT/LT				NT/LT				NT/LT	
Surface Rupture	Location of Essential Facilities		X			NT/LT				NT/LT		LT		NT	
Liquefaction	Location of Essential Facilities	X				NT/LT				NT/LT				NT/LT	
Tsunami/ Seiche	Setback and Construction Standards		X			NT/LT				NT/LT		NT/LT			
Erosion	Soil Loss and Sedimentation		X		NT		LT	NT/LT				NT/LT			
Landsliding	Setbacks from top and toe of steep slopes		X		NT/LT					NT/LT		NT/LT			
Volcanic Eruption	Planning for impacts of an ash-fall event	X				NT/LT				NT/LT				NT/LT	
Coal Mines	Construction Standards	X				NT/LT				NT/LT		NT/LT			
Flooding	Development Standards	X				NT/LT		LT		NT		LT		NT	
	Floodway Condition	X				NT/LT		LT		NT		LT		NT	
	Channel Migration	X				NT/LT		NT		LT		LT		NT	

PPC: Tends toward properly protected condition.
NPC: Tends toward not properly protected condition.
N: Neutral.
U: Unknown.
NT: Near term conditions.
LT: Long term conditions.

4.2 Surface Rupture

The Seattle Fault zone underlies the southern one-third of Bellevue. The possibility exists that all strands of the Seattle Fault in Bellevue have not yet been delineated. However, prior studies suggest the recurrence of faulting on the Seattle Fault zone is on the order of thousands of years. Although the risk of damage to essential public facilities from surface rupture is relatively low, current conditions are not properly protected.

No Action Alternative: Surface rupture is not addressed by the No Action Alternative. The No Action Alternative will have a neutral effect on public health and safety which is not properly functioning in both the near term and long term. Because existing public health and safety conditions are not properly protected from surface ruptures, the No Action Alternative will result in continued degraded conditions.

Regulatory Alternative/City Programs Alternative: Surface rupture is not addressed by the Regulatory Alternative/City Programs Alternative. The Regulatory Alternative/City Programs Alternative will have a neutral effect on public health and safety in both the near term and long term. Because existing public health and safety conditions are not properly protected from surface ruptures, the Regulatory Alternative/City Programs Alternative will result in continued degraded conditions.

BAS Based Alternative: The BAS Based Alternative recommends that all strands of the Seattle Fault within Bellevue be delineated and the risk to essential public facilities be assessed. However, at this time such information is not available. Therefore, in the near term, the BAS Based Alternative will have a neutral effect on not properly protected conditions. Assuming the information needed is available in the future, the BAS Based Alternative will lead to properly functioning conditions in the long term. The BAS Based Alternative will maintain existing public health and safety conditions in the near term and improve it in the long term.

4.3 Liquefaction

The city does not operate any essential public facilities within the liquefaction hazard areas delineated in Figure G-2 of the *March 2003 Bellevue Critical Areas Update Geologically Hazardous Areas Inventory*. Existing conditions are properly protected.

No Action Alternative: Liquefaction is not addressed by current regulations. The No Action Alternative will have a neutral effect on public health and safety conditions in both the near term and long term. The No Action Alternative will maintain existing properly protected conditions.

Regulatory Alternative/City Programs Alternative: Liquefaction is not addressed by the Regulatory Alternative. The Regulatory Alternative will have a neutral effect on public health

and safety in both the near term and long term. The Regulatory Alternative will maintain existing properly protected conditions.

BAS Based Alternative: The city of Bellevue currently prevents construction and operation of essential public facilities within liquefaction hazard areas. Therefore, this alternative would have a neutral effect on public health and safety conditions in both the near and long term. The BAS Based Alternative will also maintain existing conditions for public health and safety.

4.4 Tsunami and Seiche Hazards

Areas of potential tsunami inundation in Bellevue have not been delineated. Therefore, it is unknown if essential public facilities are properly protected. Public health and safety is not properly protected under existing conditions.

No Action Alternative: Tsunami and seiche inundation is not addressed by current regulations. The No Action Alternative will have a neutral effect on public health and safety in both the near term and long term. The No Action Alternative will maintain the existing degraded conditions.

Regulatory Alternative/City Programs Alternative: Tsunami and seiche inundation is not addressed by the Regulatory Alternative. The Regulatory Alternative will have a neutral effect on public health and safety in both the near term and long term. The Regulatory Alternative will maintain existing degraded conditions.

BAS Based Alternative: The city of Bellevue would delineate areas at risk from tsunami inundation and implement appropriate measures to protect public safety leading towards properly protected conditions in the near and long term. The BAS Based Alternative would improve protection of public health and safety in the near and long term.

4.5 Erosion

Current conditions may not be properly protected from erosion hazards. Although the rate of possible soil loss from protected slopes in Bellevue is currently unknown, high turbidity and sedimentation identified in Kelsey Creek suggest significant erosion is occurring within the basin. Fine sediment in creeks may result from the cumulative effects of small disturbances throughout the basin or may be derived locally from bank erosion caused by vertical incision, which is typical of urban channels such as Kelsey Creek.

No Action Alternative: Some of the existing regulations tend toward properly protected conditions. These include regulatory codes, which stipulate that modifications to protected slopes will use construction methods that improve or do not adversely impact erosion (LUC 20.25H.070.B3). In addition, certain design elements of LUC 20.25H.110.D tend toward properly protected conditions. However, the combined effects of the No Action Alternative on

trends in soil loss and sedimentation are currently unknown given the lack of available data on contemporary erosion rates in Bellevue. Sedimentation in Kelsey Creek provides anecdotal evidence that the No Action Alternative tends toward near term conditions that are not properly protected. Long term trends toward properly protected conditions are unknown at this time. The No Action Alternative will degrade protective conditions in the near term and likely the long term.

Regulatory Alternative/City Programs Alternative: The replacement of LUC 20.25H.110.D with the new section on subdivision density (LUC 20.25H.100.E) proposed in the Regulatory Alternative/City Programs Alternative could increase the dwelling units per acre by eliminating the development factor. This affords the same level of protection against erosion and sedimentation as the No Action Alternative. However, the proposed Regulatory Alternative/City Programs Alternative for LUC 20.25H.070.B3, which provides greater restriction for development of steep slopes with significant habitat value, will tend toward properly protected conditions. Consequently, the Regulatory Alternative/City Programs Alternative tends toward properly protected conditions in both the near term and long term. The Regulatory Alternative/City Programs Alternative will improve protection for public health and safety in the near term and the long term.

BAS Based Alternative: This alternative would also require that erosion areas be delineated and classified into hazard classes based on potential risk. The highest hazard rating would be used to determine setbacks when no site specific studies are provided. The BAS Based Alternative will tend to improve properly protected conditions in both the near term and long term. This alternative will improve protection for public health and safety in the near term and long term.

4.6 Landsliding

Current public health and safety conditions are properly protected from landslide hazards, with the exception of property located at the base of steep slopes. Public health and safety is currently not protected from landslide run-out at the base of steep slopes. Slopes steeper than 40 percent have been designated as landslide hazard areas and are shown on generalized maps prepared by the city. In addition, site-specific surveys are still required to determine if protected slopes exist on a property.

No Action Alternative: Current regulations (LUC 20.25H.070.B3) tend toward properly protected conditions by stipulating construction methods that will improve or not adversely affect the stability of protected slopes. However, other regulations tends toward conditions that are not properly protected in both the near term and long term. Under the No Action Alternative, steep slopes are regulated through the city's protected slopes ordinance (LUC 20.25H.70.A4). Slopes ranging from 15 percent to 40 percent and which contain areas with "colluvium" or landslide deposits require a 75 foot primary setback at the toe of slope plus and additional 15 foot structure toe setback. Slopes 40 percent and steeper only require setbacks at the top of the slope. Hence, conditions at the toe of slopes that are 40 percent and steeper are not properly

protected by setbacks. The No Action Alternative will continue to degrade public health and safety.

As suggested in the *March 2003 Bellevue Critical Areas Update Geologically Hazardous Areas Inventory*, the word "colluvium" should be deleted from the code. Colluvium is a general term applied to a loose, unconsolidated mixture of weathered bedrock and soil that is transported downslope under extremely slow transport rates by gravitational creep. Colluvium is present on nearly all slopes in Bellevue, and its use as an indicator of prior landslide activity is misleading. The use of the word "colluvium" in the No Action Alternative tends toward conditions that are not properly protected.

Regulatory Alternative/City Programs Alternative: Proposed revisions will add a 75-foot setback at the toe of slopes that are 40 percent and steeper. While proposed revisions tend toward properly protected conditions, best available science suggests toe-of-slope setbacks should be scaled by slope height and include provisions to mitigate hazards from debris flows. Slopes 40 percent and steeper should be required to have a toe setback equal to 1.5 times the slope height. For slopes steeper than 40 percent and higher than 200 feet, a site-specific investigation should be performed by a licensed engineering geologist to evaluate debris-flow hazards. Additional habitat-based requirements for modifications, as proposed under the Regulatory Alternative/City Programs Alternative tend toward properly protected conditions. Nevertheless, the proposed revisions will improve existing conditions. As a result, the Regulatory Alternative/City Programs Alternative will improve existing conditions for public health and safety in the near term and in the long term.

BAS Based Alternative: This alternative would require that landslide areas be delineated and classified into hazard classes based on potential risk. The highest hazard rating would be used to determine setbacks when no site specific studies are provided. The BAS Based Alternative will tend to improve properly protected conditions in both the near term and long term. This alternative will improve protection for public health and safety in the near term and long term.

4.7 Volcanic Eruption

Public health and safety conditions in Bellevue are properly protected from ash-fall hazards through emergency response plans at both the State and city levels. Mitigation strategies such as a warning system and an emergency communications plan for natural disasters are identified in the Washington State Hazard Mitigation Program. In addition, Bellevue has an Emergency Management Program which activates an Emergency Operations Center during a disaster.

No Action Alternative: Volcanic hazards are not specifically addressed by the No Action Alternative. The No Action Alternative will have a neutral effect on public health and safety in both the near term and long term. The No Action Alternative will maintain public health and safety.

Regulatory Alternative/City Programs Alternative: Volcanic hazards are not specifically addressed by the Regulatory Alternative. The Regulatory Alternative/City Programs Alternative will have a neutral effect on public health and safety in both the near term and long term. The Regulatory Alternative will maintain public health and safety.

BAS Based Alternative: At this time the risks from volcanic ash and eruptions is highly uncertain and the city has mitigation measures in place to address emergency conditions. Therefore, in the near term the BAS Based Alternative will have a neutral effect on existing conditions. Assuming the information needed is available in the future, the BAS Based Alternative will lead to properly functioning conditions in the long term. The BAS Based Alternative will maintain public health and safety in the near term and the long term.

4.8 Coal Mines

Current public health and safety conditions are properly protected from coal mine hazards by the city's existing Coal Mine Area Subdivision, Development, and Building Permit Regulations (LUC 20.25H.070.A5).

No Action Alternative: Current regulations tend toward neutral conditions in both the near term and long term for protection of public health and safety. The No Action Alternative will maintain public health and safety in the near and long term.

Regulatory Alternative/City Programs Alternative: No changes to the code regulating coal mine hazard areas are proposed under the Regulatory Alternative. Therefore, the Regulatory Alternative will have a neutral effect on current conditions. The Regulatory Alternative/City Programs Alternative will maintain public health and safety in the near and long term.

BAS Based Alternative: BAS recommends that the existing abandoned mines inventory be improved through site specific studies in areas suspected of having significant coal mining hazards. The BAS Based Alternative will lead towards properly protected public health and safety conditions in both the near and long term. The BAS Based Alternative will improve public health and safety in both the near and long term.

4.9 Frequently Flooded Areas

The city designates all areas of special flood hazard as Protected Areas. Indicators of whether conditions are properly protected from flood hazards have been classified into three categories: these include standards for development in frequently flooded areas, the management of floodway conditions, and measures to mitigate the effects of potential channel migration.

4.9.1 Development Standards

The criteria for evaluating if conditions are properly protected with respect to development standards include the siting of essential public facilities and development in areas of special flood hazard. With respect to development standards, current conditions in Bellevue are properly protected from the effects of flooding.

No Action Alternative: Current development standards tend toward properly protected conditions in the near and long term. Under the No Action Alternative, no development, use, land alteration, or activity may occur within critical areas which include areas of special flood hazard. The No Action Alternative will maintain public health and safety in the near and long term.

Regulatory Alternative/City Programs Alternative: Proposed regulations tend toward properly protected conditions in both the near term and long term by providing greater detail on base flood elevations through proposed revisions to flood insurance studies and flood insurance resource maps (FIRMs). New limits on impervious surfaces and incentives for using low impact development practices will be implemented. The Regulatory Alternative/City Program Alternative will improve properly protected conditions in the long term as redevelopment occurs but will be nuetral in the near term due to past development practices. The Regulatory Alternative/City Program Alternative will improve public health and safety in the long term and will maintain it in the near term.

BAS Based Alternative: This alternative recommends improved hydrologic modeling, new flood control projects and public buyouts of frequently flooded areas. The BAS Based Alternative will improve properly protected conditions in the long term as redevelopment occurs but not in the near term due to past development practices. The BAS Based Alternative will improve public health and safety in the long term and will maintain it in the near term.

4.9.2 Floodway Conditions

The criteria for evaluating floodway conditions are based on whether basin development significantly increases the base flood elevation. Increases in the base flood elevation can result from the alteration of flood-carrying capacity or floodplain storage caused by development within the floodway or from an increase in runoff caused by urbanization and an increase in impervious area. Current conditions are properly protected with respect to floodway conditions through a capital improvement program that tracks and mitigates flooding throughout the city with the construction of stormwater management projects.

No Action Alternative: Existing regulations (LUC 20.25H.070.C) tends toward properly protected floodway conditions in both the near term and the long term therefore the No Action Alternative will have a neutral effect. The No Action Alternative will maintain public health and safety in the near and long term.

Regulatory Alternative/City Programs Alternative: The Regulatory Alternative/City Program Alternative establishes a standard to ensure that there would be no rise in flood levels, increasing protection against the risk of off-site flooding resulting from development. Revisions to LUC 20.25H.070 provide greater detail on base flood elevations through proposed revisions to flood insurance studies and FIRMs. The coupling of proposed updates to FIRMs (LUC 20.25H.070.A1) will increase protection for floodways. The Regulatory Alternative/City Program Alternative includes proposed exceptions to restrict use and general requirements to improve existing construction located within an area of special flood hazard (LUC 20.25H.110.A). The Regulatory Alternative/City Program Alternative will incorporate data on channel migration into any new flood hazard designations. This alternative will have a neutral effect on existing conditions in the near term and will tend towards properly protected floodway conditions in the long term as redevelopment rates alter existing development conditions. The Regulatory Alternative/City Program Alternative will maintain public health and safety in the near term and improve it in the long term.

BAS Based Alternative: The city's proposed regulatory updates meet the recommendations of best available science. Flood control projects and public buyouts of properties affected by floodway hazards are additional measures that could be implemented. The BAS Based Alternative will have a neutral effect on conditions in the near term and tend towards properly protected floodway conditions in the long term as redevelopment rates alter conditions created by existing development. The BAS Based Alternative will maintain public health and safety in the near term and improve it in the long term.

4.9.3 Channel Migration

Setbacks from zones of potential channel migration are the criteria for evaluating protection from channel migration. Because channel migration zones have not been delineated in Bellevue, current conditions are difficult to assess. Based on the small size and confinement of Bellevue's creeks, current conditions are considered properly protected with respect to channel migration hazards.

No Action Alternative: Current regulations do not address channel migration zones and will have a neutral effect on current conditions in both the near term and long term. The No Action Alternative will maintain public health and safety in the near and long term.

Regulatory Alternative/City Programs Alternative: Proposed revisions to LUC 20.25H.070.A1 will incorporate data on channel migration into any new flood hazard designations. The Regulatory Alternative/City Program Alternative will have a neutral effect on existing conditions in the near term and tend towards properly protected conditions in the long term. The Regulatory Alternative/City Program Alternative will maintain public health and safety in the near and improve it in the long term as redevelopment rates alter conditions created by existing development.

BAS Based Alternative: The city's proposed regulatory updates meet the recommendations of best available science. Flood control projects and public buyouts of properties affected by

floodway hazards are additional measures that could be implemented. The BAS Based Alternative will have a neutral effect on existing conditions in the near term and tend towards properly protected floodway conditions in the long term as redevelopment rates alter conditions created by existing development. The BAS Based Alternative will maintain public health and safety in the near term and improve it in the long term.

5.0 Environmental Conditions and Risk Analysis for Streams and Riparian Areas

This document provides a discussion of Bellevue's existing stream environmental conditions and an analysis of the expected environmental risk associated with the implementation of the city's proposed critical areas update.

The streams and riparian areas analysis was conducted using the Kelsey Creek Basin and the results then extrapolated to the city of Bellevue. The Kelsey Creek Basin is composed of several streams, all of which drain to the west before entering the east sideof Lake Washington. The basin contains 10,870 acres and over 19 miles of streams including Mercer Slough, Sturtevant Creek, Kelsey Creek, Valley Creek, the West Tributary, Goff Creek, Richards Creek, East Creek, and Sunset Creek. Land use in the Kelsey Creek Basin is predominantly single-family residential, particularly in the Sunset Creek, Valley Creek and Goff Creek subbasins. The Richards Creek basin contains the highest percentage of multi-family residential land use, while the highest percentage of commercial land use is located in the Sturtevant Creek and Sears Creek basins. The Mercer Slough area has the highest percentage of open space and has the lowest amount of impervious surface. Impervious surface cover is highest in the Sturtevant Creek and Sears Creek basins and lowest in the Mercer Slough area.

The risk analysis is based on best available science and includes an assessment of existing environmental conditions, and a comparison of the expected effects of the No Action, Regulatory, City Programs, and the BAS Based Alternatives on the existing environment. The risk analysis includes a discussion of the near term (5 years) and long term (50 years) environmental effects of each of the four alternatives. The criteria used for this risk analysis were adapted from *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFW 1996). Existing environmental conditions are summarized in Table 5-1.

5.1 Water Quality

5.1.1 Temperature

The temperature indicator is functioning at risk. Monitoring by King County (King County 1994) in the lower Kelsey Creek basin between 1990 and 1993 revealed an average stream temperature of 50°F and stream temperatures at or exceeding 60.8°F on four different occasions during the months of June, July, and August. More recently, monitoring activities conducted by the University of Washington in 1998 and 1999 recorded water temperatures ranging from 61 to 63°F near the confluence of Mercer Slough with Lake Washington. Water temperatures observed during the summer months put this indicator at risk for salmonid spawning (57 to 60°F), migration (57 to 64°F), and rearing (57 to 64°F). The primary cause of high temperatures during summer months is the lack of shading in the stream as it flows through the urban environment (Bellevue 2003b). Other factors contributing to increased water temperatures

Table 5-1. Streams criteria matrix.

Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning
Water Quality:	Temperature	50-57° F [a]	57-60° F (salmonid spawning) 57-64° F (salmonid migration &rearing) [b]	> 60° F (salmonid spawning) > 64° F (salmonid migration & rearing) [b]
	Sediment/Turbidity	< 12% fines (<0.85mm) in gravel,[c] turbidity low	12-17%,[c] turbidity moderate	>17%[c] fines at surface or depth in spawning habitat,[b] turbidity high
	Chemical Contamination or Excess Nutrients	Low levels of chemical contamination from agricultural, industrial and other sources, no excess nutrients, no CWA 303d designated reaches [e]	Moderate levels of chemical contamination from agricultural, industrial and other sources, some excess nutrients, one CWA 303d designated reach [e]	High levels of chemical contamination from agricultural, industrial and other sources, high levels of excess nutrients, more than one CWA 303d designated reach [e]
Habitat Access:	Physical Barriers	Any man-made barriers present in watershed allow upstream and downstream fish passage at all flows	Any man-made barriers present in watershed do not allow upstream and/or downstream fish passage at base/low flows	Any man-made barriers present in watershed do not allow upstream and/or downstream fish passage at a range of flows
Habitat Elements:	Substrate	Dominant substrate is gravel or cobble (interstitial spaces clear), or embeddedness <20% [c]	Gravel and cobble is subdominant, or if dominant, embeddedness 20-30% [c]	Bedrock, sand, silt or small gravel dominant, or if gravel and cobble dominant, embeddedness >30% [b]
	Large Woody Debris	>80 pieces/mile;[d] adequate sources of woody debris recruitment in riparian areas	Currently meets standards for properly functioning, but lacks potential sources from riparian areas of woody debris recruitment to maintain that standard	Does not meet standards for properly functioning and lacks potential large woody debris recruitment
	Pool Frequency channel width / # pools/mile [f] 5 feet 184 10 feet 96 15 feet 70 20 feet 56 25 feet 47 50 feet 26 75 feet 23	Meets pool frequency standards (left) and large woody debris recruitment standards for properly functioning habitat (above)	Meets pool frequency standards but large woody debris recruitment inadequate to maintain pools over time	Does not meet pool frequency standards
	Pool Quality*	Pools >1 meter deep (holding pools) with good cover and cool water,[c] minor reduction of pool volume by fine sediment	Few deeper pools (>1 meter) present or inadequate cover/temperature,[c] moderate reduction of pool volume by fine sediment	No deep pools (>1 meter) and inadequate cover/temperature,[c] major reduction of pool volume by fine sediment

Table 5-1 (continued). Streams criteria matrix.

Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning
Habitat Elements (continued)	Off-channel Habitat	Backwaters with cover, and low energy off-channel areas (ponds, oxbows, etc.) [c]	Some backwaters and high energy side channels [c]	Few or no backwaters, no off-channel ponds [c]
	Refugia (important remnant habitat for sensitive aquatic species) *	Habitat refugia exist and are adequately buffered (e.g., by intact riparian reserves); existing refugia are sufficient in size, number and connectivity to maintain viable populations or sub-populations [g]	Habitat refugia exist but are not adequately buffered (e.g., by intact riparian reserves); existing refugia are insufficient in size, number and connectivity to maintain viable populations or sub-populations [g]	Adequate habitat refugia do not exist [g]
Channel Condition & Dynamics:	Width/Depth Ratio	<10 [b,d]	10-12 (we are unaware of any criteria to reference)	>12 (we are unaware of any criteria to reference)
	Streambank Condition	>90% stable; i.e., on average, less than 10% of banks are actively eroding [b]	80-90% stable	<80% stable
	Floodplain Connectivity	Off-channel areas are frequently hydrologically linked to main channel; overbank flows occur and maintain wetland functions, riparian vegetation and succession	Reduced linkage of wetland, floodplains and riparian areas to main channel; overbank flows are reduced relative to historic frequency, as evidenced by moderate degradation of wetland function, riparian vegetation/succession	Severe reduction in hydrologic connectivity between off-channel, wetland, floodplain and riparian areas; wetland extent drastically reduced and riparian vegetation/succession altered significantly
Flow/Hydrology:	Change in Peak/ Base Flows	Watershed hydrograph indicates peak flow, base flow and flow timing characteristics comparable to an undisturbed watershed of similar size, geology and geography	Some evidence of altered peak flow, baseflow and/or flow timing relative to an undisturbed watershed of similar size, geology and geography	Pronounced changes in peak flow, baseflow and/or flow timing relative to an undisturbed watershed of similar size, geology and geography
	Increase in Drainage Network*	Zero or minimum increases in drainage network density due to roads [h,i]	Moderate increases in drainage network density due to roads (e.g., 5%) [h,i]	Significant increases in drainage network density due to roads (e.g., 20-25%) [h,i]
Watershed Conditions:	Road Density & Location*	<2 mi/mi², [k] no valley bottom roads	2-3 mi/mi², some valley bottom roads	>3 mi/mi², many valley bottom roads
	Disturbance History*	<15% equivalent clearcut area (ECA) with no concentration of disturbance in unstable or potentially unstable areas, and/or refugia, and/or riparian area	<15% ECA but disturbance concentrated in unstable or potentially unstable areas, and/or refugia, and/or riparian area	>15% ECA and disturbance concentrated in unstable or potentially unstable areas, and/or refugia, and/or riparian area

Table 5-1 (continued). Streams criteria matrix.

Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning
Watershed Conditions: (continued)	Riparian Reserves	The riparian reserve system provides adequate shade, large woody debris recruitment, and habitat protection and connectivity in all subwatersheds, and buffers or includes known refugia for sensitive aquatic species (>80% intact),and/or for grazing impacts: percent similarity of riparian vegetation to the potential natural community/ composition >50% [l]	Moderate loss of connectivity or function (shade, LWD recruitment, etc.) of riparian reserve system, or incomplete protection of habitats and refugia for sensitive aquatic species (70-80% intact), and/or for grazing impacts: percent similarity of riparian vegetation to the potential natural community/composition 25-50% or better [l]	Riparian reserve system is fragmented, poorly connected, or provides inadequate protection of habitats and refugia for sensitive aquatic species (<70% intact), and/or for grazing impacts: percent similarity of riparian vegetation to the potential natural community/composition <25% [l]
	Natural Disturbances	Climatic (temperature and rainfall) and geologic processes (earthquake, soil formation, and transport processes) are allowed to occur [m]	Frequency and magnitude of disturbance events are altered [m]	Disturbance regime is non-existent due to development preventing natural events [m]
	Total Impervious Area (TIA)	< 10% TIA [n]	10 - 40%TIA [n]	> 40% TIA [n]
	Riparian Breaks	< 10% TIA within 100' [n]	10-40% TIA within 100' [n]	> 40% TIA within 100' [n]

*Watershed-scale data is limited, therefore data at the reach-scale maybe used for risk analysis.
Source: Adapted from Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale (NOAA Fisheries 1996).
References:

[a] Bjornn, T.C. and D.W. Reiser. 1991. Habitat Requirements of Salmonids in Streams. American Fisheries Society Special Publication 19:83-138. Meehan, W.R., ed.
[b] Biological Opinion on Land and Resource Management Plans for the: Boise, Challis, Nez Perce, Payette, Salmon, Sawtooth, Umatilla, and Wallowa-Whitman National Forests. March 1, 1995.
[c] Washington Timber/Fish Wildlife Cooperative Monitoring Evaluation and Research Committee. 1993. Watershed Analysis Manual (Version 2.0). Washington Department of Natural Resources.
[d] Biological Opinion on Implementation of Interim Strategies for Managing Anadromous Fish-producing Watersheds in Eastern Oregon and Washington, Idaho, and Portions of California (PACFISH). National Marine Fisheries Service, Northwest Region, January 23, 1995.
[e] A Federal Agency Guide for Pilot Watershed Analysis (Version 1.2), 1994.
[f] USDA Forest Service. 1994. Section 7 Fish Habitat Monitoring Protocol for the Upper Columbia River Basin. United States Department of Agriculture.
[g] Frissell, C.A., W.J. Liss, and David Bayles. 1993. An Integrated Biophysical Strategy for Ecological Restoration of Large Watersheds. Proceedings from the Symposium on Changing Roles in Water Resources Management and Policy, June 27-30, 1993 (American Water Resources Association), p. 449-456.
[h] Wemple, B.C. 1994. Hydrologic Integration of Forest Roads with Stream Networks in Two Basins, Western Cascades, Oregon. M.S. Thesis, Geosciences Department, Oregon State University.
[i] Elk River Watershed Analysis Report. 1995. Siskiyou National Forest, Oregon.
[j] Northwest Forest Plan. 1994. Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. USDA Forest Service and USDI Bureau of Land Management.
[k] USDA Forest Service. 1993. Determining the Risk of Cumulative Watershed Effects Resulting from Multiple Activities.
[l] Winward, A.H. 1989. Ecological Status of Vegetation as a base for Multiple Product Management. Abstracts 42nd annual meeting, Society for Range Management, Billings MT, Denver CO: Society For Range Management: p277.
[m] Natural Resources Council. 1995. Upstream: salmon and people in the Pacific Northwest. Committee on Protection and management of Pacific Northwest anadromous salmonids, Board on Environmental Studies and Toxicology, Commission on Life Sciences, National Research Council, Washington, D.C.
[n] May, C.W., E.B. Welch, R.R. Horner, J.R. Karr, and B.W. Mar. 1997. Quality indices for urbanization effects in Puget Sound lowland streams, Washington Department of Ecology, Seattle, WA. p229.

include heating of impervious surfaces, reduction in channel sinuosity, and reduction in hyporheic flows.

No Action Alternative: Under the No Action Alternative, the temperature indicator tends toward not properly functioning conditions in the near and long term. Therefore, the No Action Alternative will continue to degrade the habitat conditions in both the near term and long term. Elevated summer water temperatures above optimum levels for salmonids will continue to occur under the No Action Alternative. Water temperatures could increase slightly due to development encroachment within riparian corridors that is allowed under current riparian corridor setbacks (LUC 20.25H.070.A2). (Riparian corridors vegetated with mature trees are needed within setbacks to provide adequate stream coverage).

Regulatory Alternative: Under the Regulatory Alternative, the temperature indicator tends toward not properly functioning conditions in the near and long term and therefore will result in degraded habitat conditions in both the near term and long term. The Regulatory Alternative may lessen the current trend toward degradation of ecological functions of streams and riparian areas (specifically as habitat for salmonid fish species), by limiting the degree of clearing and development that could occur on the remaining undeveloped land adjacent to streams and wetlands. However, this alternative would not change the water temperature trajectory in a positive or restorative, direction. The designation of additional land areas as riparian setbacks is not expected to result in substantial improvements in shade quality within the basin over time. Although the Regulatory Alternative will protect existing vegetation within a 100-foot setback along most streams, stream temperature may continue to rise in future years. Stream temperature is the result of complex interactions between geomorphology, soil, hydrology, vegetation, and climate (IMST 2000). The creation of overhanging riparian vegetation composed of various vegetation strata can provide some streamside shading and thereby result in maintaining water temperatures or restore cool stream temperatures. Research suggests that effective riparian buffers range from 35 to 151 feet for stream temperature control (May et al. 1997). Existing land uses along streams prevent the establishment of riparian forest within the effective range defined in the literature to provide adequate shade along streams.

City Programs Alternative: Under the City Programs Alternative, the temperature indicator tends toward not properly functioning in the near term. In the long term, the City Programs Alternative moves the temperature indicator toward properly functioning conditions by improving stream riparian conditions. Therefore, the City Programs Alternative will result in degraded habitat conditions in the near term, but will improve conditions in the long term.

Through the acquisition program, the city could acquire up to approximately 207 acres of stream and stream buffer areas for restoration and preservation. Unlike the Regulatory Alternative which only preserves existing vegetation, the City Programs Alternative restores vegetation which may provide shade cover for streams. Implementation of the rehabilitation/monitoring program restores areas to optimum conditions by restoring native vegetation and providing on-going maintenance to remove invasive plant species through stewardship programs. The planting of native shrub and coniferous trees will have minimal immediate (near term) effects on existing summer water temperatures. In the long term, summer temperatures may decrease

slightly as a result of restoring riparian areas that provide shade which protect stream surfaces from direct solar radiation. The City Programs Alternative may also improve summer water temperatures by restoring wetlands and detention ponds that promote stormwater infiltration and greater groundwater and hyporheic inflow to streams. A proposed monitoring program could provide data for future actions (adaptive management plan) through an investigation of buffer width conditions which improve water temperature. The monitoring program would supplant fixed buffer sizes with variable buffer widths determined on a site-specific basis. Implementation of the rehabilitation/monitoring program would confer on the city the responsibility for managing critical areasand setbacks that are set aside as buffer areas.

BAS Based Alternative: To improve riparian functions such as water temperature moderation based on BAS, it is recommended that riparian areas be established (i.e., planting multi-strata vegetation) along the streambanks and that riparian structure setbacks be implemented which protect an area of sufficient size to provide riparian and aquatic processes and buffer against development impacts. The effectiveness of a buffer to provide multiple functions and benefits is linked to its width and other factors such as slope, vegetation characteristics, soil type, buffer design and buffer management. Buffer width established using the site potential tree height (SPTH) concept can provide the ecological functions necessary to support salmonids and most riparian and aquatic functions and processes. However, the developed character of the city makes the establishment of riparian areas as well as the adoption of fully protective buffers based on SPTH impractical.

Both the Regulatory and the City Programs Alternatives contain elements that are consistent with BAS. For example, the Regulatory Alternative includes increasing structural and riparian setbacks and setting limits for impervious surfaces. Proposed riparian setbacks include 100 feet for Type S streams; 100 feet for Type F streams; 50 feet for Type N streams; and 25 feet for Type O streams. Structural setbacks are proposed to range from 10 to 20 feet. Also, through the acquisition program, the city could acquire up to approximately 207 acres of stream and stream buffer areas for restoration and preservation. In addition, implementation of the rehabilitation/monitoring program will restore areas to optimum conditions by restoring native vegetation and providing on-going maintenance to remove invasive plant species through stewardship programs.

Consequently, under the BAS Based Alternative, the temperature indicator tends toward not properly functioning conditions in the near term. In the long term, the BAS Based Alternative moves the temperature indicator toward properly functioning conditions by establishing multi-strata vegetation layers where short grass lawns exist and improving and protecting existing stream riparian areas. Therefore, the BAS Based Alternative will result in degraded habitat conditions in the near term, but will improve conditions in the long term.

5.1.2 Sediment and Turbidity

The sediment and turbidity indictor is not properly functioning. A properly functioning stream has less than 12 percent fine-grained sediment within the stream substrate as well as low turbidity (NOAA Fisheries 2001). High turbidity and total suspended solids have been

documented in the West Tributary of Kelsey Creek and Mercer Slough (City of Bellevue 1995; Herrera 2001c). Turbidity samples from Kelsey Creek exceeded water quality standards on nine occasions during a 2-year monitoring period by King County (1994). In the mainstem of Kelsey Creek, 22 percent of the spawning substrate is composed of fine sediment (Scott et al. 1982). Fine sediment comprised as much as 39 percent of the total substrate composition in a 1995-1996 study of Valley Creek and the mainstem Kelsey Creek (May 1996). In Richards Creek, fines comprised more than 17 percent of the spawnable substrate for a stream reach in the vicinity of Bannerwood Park (Herrera 2001a). The cause of excess fine sediments and high turbidity within the Kelsey Creek basin is likely related to the replacement of native vegetation by lawns (Bellevue 2003a). Riparian areas where native vegetation has been replaced with short grass lawns are poorly suited to preventing sediments and pollutants from entering stream channels.

No Action Alternative: Under the No Action Alternative, sediment and turbidity tend toward conditions that are not properly functioning in the near and long term. Therefore, the No Action Alternative will continue to degrade habitat conditions in both the near term and long term.

Regulatory Alternative: Under the Regulatory Alternative, the sediment and turbidity indicator tend toward conditions that are not properly functioning in the near and long term, and therefore will result in degraded habitat conditions in both the near term and long term. Unless actions are taken to address sediment sources or to prevent fine sediments from entering receiving waters, degraded sediment and turbidity conditions will continue to occur.

City Programs Alternative: Under the City Programs Alternative, the sediment and turbidity indicator tends toward not properly functioning conditions in the near and long term. The City Programs Alternative could improve sediment and turbidity locally but not at a watershed scale. This is in part because the City Programs Alternative does not include activities which specifically focus on rehabilitating streambanks which, in the city of Bellevue, are predominantly vegetated with grass. In addition, sufficient undeveloped land area along most streams is not available for vegetated streambanks to provide buffer functions. Stream bank restoration and bank stabilization projects will decrease sedimentation and restore sediment transport processes resulting in locally improved turbidity conditions. Restoration and protection of riparian areas through programs such as the rehabilitation/monitoring, stewardship, and acquisitions will also reduce fine sediment and thereby locally improve conditions for the sediment and turbidity indicator. Although there will be localized improvements from the City Programs Alternative, overall existing conditions of sediment and turbidity will continue to degrade for the near and long term.

BAS Based Alternative: Under the BAS Based Alternative, the sediment and turbidity indicator tends toward not properly functioning, and therefore will result in degraded habitat conditions in the near term. In the long term, the BAS Based Alternative moves the sediment and turbidity indicator toward properly functioning conditions for the same reasons previously presented for the temperature indicator. Therefore, the BAS Based Alternative will result in degraded habitat conditions in the near term, but will improve conditions in the long term.

5.1.3 Chemical Contaminants and Nutrients

The chemical contaminants and nutrients indicator is functioning at risk. Concentrations of chemical contaminants such as metals, hydrocarbons, and pesticides as well as excess nutrients can threaten the survival of fish and aquatic life. Streams within the Kelsey Creek basin receive numerous inputs of chemical contaminations and nutrients from urban runoff from non-point sources such as manicured lawns, parks, commercial sites, roads, sidewalks and gardens (Bellevue 2001a). In 1998, Washington Department of Ecology placed Kelsey Creek on the 303(d) impaired waters list for exceeding allowable water quality criteria for fecal coliform bacteria. Additionally, Mercer Slough was listed on the 1998 impaired waters list for exceeding fecal coliform bacteria, dissolved oxygen, and pH standards (Ecology 1998). Upper reaches of the West Tributary and Richards Creek are reported to have high levels of fecal coliform bacteria and metal concentrations (Bellevue 1995). Furthermore, eighteen pesticides at levels that may be detrimental to aquatic life have been reported for the West Tributary and Mercer Slough by the United States Geological Services (1999). Properly functioning streams have low levels of chemical contamination and nutrients (NMFS 1996).

No Action Alternative: Under existing conditions, stream critical areas receive inputs of numerous non-point source pollutants from stormwater runoff and have produced not properly functioning conditions for the chemical contaminants and nutrients indicator. Under the No Action Alternative, the chemical contaminants and excess nutrients indicator tend toward not properly functioning conditions in the near and long term. Therefore, the No Action Alternative will degrade the habitat conditions in both the near term and long term.

Regulatory Alternative: Under the Regulatory Alternative, the chemical contaminants and nutrients indicator tends toward not properly functioning conditions in the near and long term. Therefore, the Regulatory Alternative will degrade the habitat conditions in both the near term and long term.

Although the Regulatory Alternative is likely to prevent new non-point sources of pollutants within the basin, streams will continue to exhibit chemical contaminants and high level of nutrients due to existing non-point sources including manicured lawns, parks, commercial sites, roads, sidewalks, and gardens. Nonetheless, localized reductions in water pollutant concentration are likely to occur. Anticipated amendments to code under the Regulatory Alternative prescribe low impact development through site designs and stormwater management that reduces adverse impacts while accommodating growth. Key principles in the code will also include protecting native soils and vegetation and minimizing and managing stormwater at the source for new site development. The establishment of vegetation within setbacks may occur. However, the overall effect of any vegetative growth within setbacks under this alternative is not expected to move the chemical contaminants and nutrients indicator toward properly functioning conditions.

City Programs Alternative: Under the City Programs Alternative, the chemical contaminants and nutrients indicator tend toward not properly functioning conditions in the near and long term.

Therefore, the City Programs Alternative will degrade the chemical contaminants and nutrients conditions in both the near term and long term.

Programs and projects addressed in this evaluation are likely to result in localized decreases in chemical contamination and nutrients. Properly functioning conditions for streams are characterized by low levels of chemical contamination and nutrients. Utilities projects included in the City Programs Alternative include retrofits and cleaning of existing structures as well as educational outreach to existing development and business partners. An increase in the maintenance frequency of stormwater facilities will reduce the input of pollutants in stormwater and will likely result in localized decreases in chemical concentrations and nutrient inputs to streams. Collectively, city programmatic actions will not address the numerous non-point sources of chemical contamination and nutrients within the watershed.

BAS Based Alternative: Under the BAS Based Alternative, the chemical contaminants and nutrients indicator tends toward not properly functioning, and therefore will result in degraded habitat conditions in the near term. In the long term, the BAS Based Alternative moves the chemical contaminants and nutrients indicator toward properly functioning conditions for the same reasons previously presented for the temperature indicator. Therefore, the BAS Based Alternative will result in degraded habitat conditions in the near term, but will improve conditions in the long term.

5.2 Habitat Access

5.2.1 Physical Barriers

The physical barriers indicator is not properly functioning. Man-made barriers block potential natural spawning and rearing habitat for fish within the Kelsey Creek basin (Kerwin 2001). Known man-made blockages to fish passage exist on Goff Creek, Sturtevant Creek, Sears Creek, Richards Creek, and East Creek (Bellevue 2003b).

No Action Alternative: Under the No Action Alternative, the physical barrier indicator will maintain conditions in the near and long term. Therefore, the No Action Alternative will degrade the habitat conditions in both the near term and long term.

Bellevue's current regulatory code does not require the removal of fish passage barriers. Additional man-made barriers are not expected within the city because in-stream project work will require fish passage in accordance with Hydraulic Project Approval from the Washington Department of Fish and Wildlife. Therefore, the No Action Alternative will maintain the current status (i.e., not properly functioning) of this indicator.

Regulatory Alternative: In the near term and long term, the Regulatory Alternative will maintain the current status of the physical barrier indicator. Therefore, the Regulatory Alternative will degrade the habitat conditions in both the near term and long term.

The Regulatory Alternative does not include requirements for the removal of existing fish passage barriers. The alternative does require that new development activity within natural watercourses not block side channels and requires compliance with fish and wildlife habitat conservation policies. Therefore, under the Regulatory Alternative physical barriers within the watershed will remain the same.

City Programs Alternative: The City Programs Alternative will have a neutral effect on the current status of the physical barrier indicator in the near term. The City Programs Alternative includes capital improvement projects to improve fish passage conditions by removing existing barriers within stream tributaries to Lake Washington and Lake Sammamish. However, given the expected level of investment the City Programs Alternative will be able to fund few culvert replacement projects in a given year. Although culvert replacement projects may open up or improve access to upstream habitat, this rate of investment and replacement is too low to allow for improvements that may be felt at the watershed scale.

In the long term, the City Programs Alternative will improve the physical barrier conditions. Projects to improve fish passage should be prioritized to provide the greatest benefit to salmon bearing streams. Culverts identified as fish passage barriers are included in the Bellevue Stream Inventory Report (Bellevue 2003b) and replacing or modified these culverts will improve fish passage conditions. Consequently, the City Programs Alternative will result in degraded habitat conditions in the near term, but will improve conditions in the long term.

BAS Based Alternative: Under the BAS Based Alternative, the current status of the physical barrier indicator will be improved in both the near and long term.

BAS activities includes fish habitat and passage restoration by daylighting piped stream segments. However, the developed character of the city makes the establishment of riparian areas along currently piped stream segments impractical in many areas. Nonetheless, capital improvement projects to restore fish passage conditions by removing existing barriers will result in a significant habitat gain.

The BAS Based Alternative moves the physical barrier indicator toward properly functioning conditions by removing existing fish barriers and by requiring that development activities within natural watercourses avoid fish habitat blockage, and that such activities be in compliance with fish habitat conservation policies. Therefore, the BAS Based Alternative will improve existing conditions.

5.3 Habitat Element

5.3.1 Substrate

The substrate indicator is at risk. There is limited documentation of substrate types within Bellevue's streams (Bellevue 2003b); conclusions for the existing conditions are drawn from stream reach surveys and the watershed conditions of Kelsey Creek. Kelsey Creek shows a very

rapid response to rain events (Richey et al. 1981). Increases in stormflow quantities and velocities in urban basins such as Kelsey Creek can cause scouring that can displace stream substrates, reducing the quality and quantity of spawning areas (May et al. 1997). In mainstem Kelsey Creek, previous studies have documented gravel and cobble as dominate substrates with fine sediment levels ranging from 22 percent to 39 percent (Scott et al., 1992; May 1996; Herrera 2001b). The dominant stream channel substrate of Valley Creek within the vicinity of State Route 520 is sand and gravel (Herrera 2002). Richard Creek's substrate in the vicinity of Bannerwood Park is characterized by fine substrate mostly composed of silt and sand (Herrera 2001a). Chinook and steelhead generally spawn in cobble, while coho, sockeye, and cutthroat may spawn in gravel. Herrera (2002) determined that Valley Creek spawning gravel embeddedness due to surface fines ranges from 19 to 73 percent within the vicinity of State Route 520. Fish species have preferences for specific sizes of gravel used to construct redds during spawning activity. A lesser embedded stream reach occurs along a 0.8 mile segment of Kelsey Creek downstream of 148th Avenue NE. Properly functioning streams do not have excess amounts of fine materials (embeddedness > 20 percent) which can embed gravel creating difficult conditions for salmonids to excavate redds (NMFS 1996).

No Action Alternative: Under the No Action Alternative, the substrate indicator tends toward not properly functioning conditions in the near and the long term. Therefore, the No Action Alternative will degrade the habitat conditions in both the near and long term. Given the extent of impervious cover in the Kelsey Creek basin and the associated high flows, it is likely that native substrate will continue to be altered by erosion and sedimentation.

Regulatory Alternative: Under the Regulatory Alternative, the substrate indicator tends toward not properly functioning conditions in the near and the long term for the same reasons provided under the No Action Alternative. Therefore, the Regulatory Alternative will degrade the habitat conditions in both the near and long term. Conditions for the indicator will continue to be degraded unless actions are taken to return erosion and sediment transport process to a natural equilibrium.

City Programs Alternative: Under the City Programs Alternative, the substrate indicator tends toward not properly functioning conditions in the near term and long term. Therefore, the City Programs Alternative will degrade the habitat conditions in both the near and long term.

The placement of large woody debris in streams could sort gravel and thereby improve the indicator; however, existing land uses and stream bank stabilization in basins would continue to prevent sufficient supplies of gravel from entering streams. The ability of a stream system to recruit additional gravels is largely related to the presence of non-armored banks that may be undercut to release gravel to the stream. Rip-rap is present throughout Bellevue's creek systems (May 1996).

BAS Based Alternative: Under the BAS Based Alternative, the substrate indicator tends toward not properly functioning and therefore, the BAS Based Alternative will degrade habitat conditions in both the near term and the long term.

Although the BAS Based Alternative will establish and protect riparian areas with multi-strata layers of vegetation, thus recreating more natural stream banks, natural disturbances such those that promote sediment recruitment from mass wasting and landslide events are not likely to be allowed due to the current developed character of the city.

5.3.2 Large Woody Debris (LWD)

The LWD indicator is not properly functioning. LWD is lacking in Kelsey Creek and the West Tributary of Kelsey Creek (May 1996). The average amount of LWD assessed during stream surveys is fewer than 17 pieces per mile (May 1996). Upstream portions of Richards Creek have been observed to lack woody debris (The Watershed Company 2001). LWD is impaired throughout the watershed by modified riparian areas, including the lack of mature trees, which contribute wood to streams (Bellevue 2001a). Properly functioning streams have adequate sources of woody debris recruitment in riparian areas and > 80 pieces of wood per mile (NMFS 1996). In addition, for riparian areas to be properly functioning for this habitat element, streamside areas should be capable of sustaining these levels of woody debris over the long term through adequate recruitment of woody debris to the stream. It is noteworthy that a recent study showed that only 11 out of 79 streams sampled in western Washington met the NMFS (1996) standard (Fox et al. 2003). However, even when compared with less stringent standards (e.g., Fox et al 2003), Kelsey Creek's large woody debris density (i.e., 17 pieces per mile) still reflects not properly functioning conditions.

No Action Alternative: Under the No Action Alternative, the LWD indicator tends toward not properly functioning in the near and long term. Therefore, the No Action Alternative will degrade the habitat conditions in both the near and long term.

The potential for LWD recruitment could continue to decrease under current riparian corridor regulation. LWD recruitment to stream channels within Western Washington may occur from a distance as great as 150 feet (Bellevue 2003a). The existing regulation provide riparian setbacks ranging from 15 feet to 70 feet (LUC 20.25H.070.A2). The existing buffer regulations do not adequately provide for the protection of LWD recruitment, therefore conditions for sources of woody debris recruitment in riparian areas are likely to decrease. The numbers of pieces of woody debris within streams will remain the same or increase modestly.

Regulatory Alternative: The Regulatory Alternative will not improve the existing conditions of the LWD indicator in the near term and long term therefore existing conditions will continue to degrade. Riparian (100 feet for Type S; 100 feet for Type F; 50 feet for Type N; and 25 feet for Type O) and structural setbacks (10 to 20 feet) will provide protection for woody debris recruitment from existing vegetated areas. The alternative will not improve the LWD indicator because quantity of LWD within riparian areas is not expected to increase. Riparian areas within the city are frequently developed and are not expected to contribute significant LWD to the stream channel or increase the number of pieces within streams.

City Programs Alternative: The City Programs Alternative tends toward properly functioning conditions in the near and long term. Therefore, the City Programs Alternative will improve the habitat conditions in both the near and long term. The placement of LWD structures within the stream channel will increase the quantity and quality of LWD within stream channels. The potential recruitment of LWD from riparian areas may be realized through the planting of riparian vegetation as part of the City Programs Alternative.

BAS Based Alternative: The BAS Based Alternative moves the current status of the LWD indicator toward properly functioning and therefore, this alternative will improve habitat conditions in both the near and long term.

The BAS Based Alternative will restore degraded riparian areas using strategies which emphasize the whole watershed and ecological processes which include installing LWD (near term effect) and planting native coniferous trees along the streams (long term effect).

5.3.3 Pool Frequency

The pool frequency indicator is not properly functioning. The standard for properly functioning pool frequency is 56 pools per mile for a 20-foot average channel width. May (1996) estimated average pool frequency of less than 13 pools per mile within the mainstem of Kelsey Creek and Valley Creek subbasins. A reach assessment of Valley Creek in the vicinity of State Route 520 determined an average pool frequency of 31 pools per mile (Herrera 2002). Pool frequency for Richards Creek in the vicinity of Bannerwood Park is estimated at 72 pools per mile of stream channel (Herrera 2001a). Natural elements within streams such as sediment supply and LWD frequency have been shown to be directly proportional to the frequency of pools within streams (Bellevue 2003a).

No Action Alternative: Under the No Action Alternative, the pool frequency indicator tends toward not properly functioning in the near and long term. Therefore, the No Action Alternative will degrade the existing habitat conditions in both the near and long term.

Two factors contribute to the decline of pools: 1) the removal of LWD, which may form pools and 2) increased frequency and magnitude of peak discharge rates, which may scour pools and woody debris from the channel (May et al. 1997). As previously stated, the LWD indicator is not properly functioning under the No Action Alternative. Consequently, woody debris recruitment to streams for pool formation is expected to decrease under the No Action Alternative resulting in fewer pools. Additionally, high flows within streams will continue to occur and thereby diminish the presence of pools within streams.

Regulatory Alternative: Under the Regulatory Alternative, the pool frequency indicator tends toward not properly functioning conditions in the near term and long term. Therefore, the Regulatory Alternative will degrade the habitat conditions in both the near and long term. Setbacks could maintain existing conditions for LWD recruitment by restricting development of existing vegetated riparian areas. However, under this alternative, high discharge flows resulting

from stormwater runoff will continue to occur within streams and have the potential to reduce the frequency of pools.

City Programs Alternative: The City Programs Alternative, in the near and long term, tends toward not properly functioning conditions. Therefore, the City Programs Alternative will degrade habitat conditions in both the near and long term. Restoration projects include LWD placed structures, bank stabilization projects, and stream channel enhancements. Water flowing over and around large woody debris could create pools and contribute to the maintenance of deep structurally complex pools. Bank stabilization projects could prevent erosion which may lead to fine sediments filling pools. The pool frequency indicator is described as properly functioning when pool frequency standards are met and the LWD indicator is properly functioning (NMFS 1996). The described restoration projects are not likely to result in significant changes in pool frequency indicator.

BAS Based Alternative: The BAS Based Alternative moves the current status of the pool frequency indicator toward properly functioning and therefore, this alternative will improve habitat conditions in both the near and long term.

The BAS Based Alternative will restore degraded riparian areas using more resources and similar strategies but which emphasize the whole watershed and ecological processes. Activities also include installing LWD (near term effect) and planting native coniferous trees along all streams (long term effect) and at a higher rate that the City Program Alternative. The pool frequency indicator is described as properly functioning when pool frequency standards are met and the LWD indicator is properly functioning (NMFS 1996). Based on BAS (Fox et al. 2003), the LWD standard will be easier to meet at the watershed scale through the implementation of the BAS Based Alternative.

5.3.4 Pool Quality

The pool quality indicator is at risk. There is little documentation related to specific pool quality in Bellevue's streams; therefore, this section describes pool quality based on processes (e.g., increased peak flows, bank erosion, and sedimentation) that have resulted from development within the Kelsey Creek basin. Studies have shown that stream habitat in urban and urbanizing streams typically includes reduced pool frequency and reduced overall habitat quality. The pool quality indicator is not properly functioning due to previously stated conditions for other indicators such as excess fine sediments, insufficient LWD, and warm stream temperatures within the basin. Properly functioning streams have pools deeper than 1 meter with good cover and cool water (NMFS 1996). Pool depth, surface areas, and cover-quality are directly related to LWD quantity and quality (Andrus et al. 1988; Robison and Beschta 1990). Reach assessments within the basin document that wood and tree roots contribute to high quality pools in some segments of streams within the Kelsey Creek basin. These areas include reaches of upper East Creek, upper Richards Creek, and segments of Sunset Creek.

No Action Alternative: Under the No Action Alternative, the pool quality indicator tends toward not properly functioning in the near and long term. Therefore, the No Action Alternative will degrade the existing habitat conditions in both the near and long term. A slight decrease in pool quality may occur through the removal of LWD in streams, reduced riparian cover, or increased stream temperatures.

Regulatory Alternative: The Regulatory Alternative will maintain the existing conditions of the pool quality indicator in the near and long term. Pool quality is directly related to LWD quantity and quality. As previously stated LWD is maintained under the Regulatory Alternative. Therefore, existing conditions for pool quality are likely to remain the same under the Regulatory Alternative.

City Programs Alternative: In the near term and long term, the City Program Alternative will improve pool quality conditions. Pool quality is rated as good for segments of East Creek, Richards Creek, and Sunset Creek. Pool quality could improve in other creek segments through streamside plantings of coniferous and deciduous trees and the addition of instream LWD. The addition of LWD would result in the sorting of gravel and formation of deep pools. Tree and shrub planting along streams will provide canopy and overhanging cover as this vegetation mature.

BAS Based Alternative: In both the near and long term, the BAS Based Alternative moves the current status of the pool quality indicator toward properly functioning. Therefore, this alternative will improve habitat conditions in both the near and long term for the same reason previously stated for the pool frequency indicator.

5.3.5 Off-channel Habitat

The off-channel habitat indicator is functioning at risk. Studies in urban basins indicate that off-channel habitat may be reduced by urban development. Causes of this loss include channel straightening and disconnection from adjacent wetland areas (May et al. 1997). The filling, conversion or blockage of off-channel habitat for other development has occurred throughout the city (Herrera 2001; Bellevue 2003a, 2003b). However, good quality off-channel habitat exists from Lake Hills to Kelsey Creek farm. Habitat in portions of upper Kelsey Creek is of poor quality; habitat is overgrown with reed canarygrass and channelized (Watershed Company 2001). The subbasins of Richards Creek and Valley Creek have high quality riparian wetlands which provide off-channel habitat (Bellevue 1999; Herrera 2002). Properly functioning streams contain backwaters with cover and low energy off-channel areas.

No Action Alternative: Under the No Action Alternative, the off-channel indicator will be maintained at its at risk in the near and long term. An increase or decrease in off-channel habitat is not expected to occur.

Regulatory Alternative: The Regulatory Alternative will maintain the current status of the off-channel habitat indicator in the near term and long term. The amendments to code will provide

protection to riparian corridors through the establishment of setbacks which preserve much of the existing off-channel habitat adjacent to the mainstem. Furthermore, Regulatory Alternative requires the avoidance of development which blocks side channels.

City Programs Alternative: The City Programs Alternative will maintain the current status of the off-channel habitat indicator in the near term. The City Programs Alternative includes the acquisition of up to 207 acres of stream riparian areas over a redevelopment timeframe of 50 years (long term). Given the expected level of investment for floodplain restoration and riparian planting projects the City Programs Alternative will be limited in its effect in the near term.

Acquisition and restoration activities will locally improve the off-channel habitat conditions; however in the near term the effect of this program are not likely to be felt at the basin-wide scale.

In the long term, the City Programs Alternative will improve off-channel habitat conditions. The acquisition and restoration programs will improve the off-channel habitat conditions by restoring and protecting access to wetlands and side channels for salmonid fish species and other aquatic organisms. The quantity and quality of off-channel habitat will improve; however, the condition of off-channel habitat is likely to remain below historical levels.

BAS Based Alternative: Under the BAS Based Alternative, the off-channel habitat indicator will be maintained at its current status in the near term. In the long term, the BAS Based Alternative moves the off-channel habitat indicator toward properly functioning conditions for the same reasons previously presented for the temperature and pool frequency indicators. Therefore, the BAS Based Alternative will improve off-channel habitat conditions in the long term.

5.3.6 Refugia

The refugia indicator is functioning at risk. There is little documentation related to refugia habitat in the Kelsey Creek basin; therefore, this section describes refugia based on the reach-scale data. Properly functioning streams have refugia for sensitive aquatic species that are buffered and connected to other refugia habitats (NMFS 1996). Instream LWD and off-channel habitat can create high streamflow refugia against flood scour while mainstem pools can offer thermal refugia for migrating salmonids (Bellevue 2003a). Valley Creek in the vicinity of State Route 520 provide fair to poor pool habitat and fragmented riparian reserves buffers (Herrera 2001, 2002). Segments of Kelsey Creek near NE 8th Street and east of 132nd Avenue NE provide moderate pool habitat for refugia but lack intact riparian reserves for buffering (Herrera 2001).

No Action Alternative: Under the No Action Alternative, the refugia indicator tends toward not properly functioning conditions in the near and long term. Therefore, the No Action Alternative will degrade the existing habitat conditions in both the near and long term. Activities which have resulted in this indicator functioning at risk will continue to occur.

Regulatory Alternative: The Regulatory Alternative will maintain the current status of the refugia indicator over the near and long term through the expansion of riparian setbacks.

City Programs Alternative: Under the City Programs Alternative, the refugia conditions would be maintained in the near and long term.

Acquisition of up to 207 acres of stream and riparian areas together with restoration will locally improve refugia. Also, the placement of instream LWD and replanting vegetation at specific locations along stream channels will provide improved conditions for sensitive aquatic species. Installed LWD would provide hydraulic refuge areas during peak flows while overhanging vegetation would provide shade cover of these areas. However, the effects of these programs are not likely to be felt at the basin-wide scale.

BAS Based Alternative: Under the BAS Based Alternative, the refugia indicator will be maintained at its current status in the near term. In the long term, the BAS Based Alternative moves the refugia indicator toward properly functioning conditions for the same reasons previously presented for the temperature and pool frequency indicators. Therefore, the BAS Based Alternative will improve refugia conditions in the long term.

5.4 Channel Condition and Dynamics

5.4.1 Width/Depth Ratio

The width to depth ratio is properly functioning. Channel width to depth ratios observed during reach assessments within Valley Creek and Kelsey Creek range from 8.95 to 9.6 (Herrera 2001b, 2002). A width/depth ratio greater than 12 is not properly functioning. Stream channel width/depth ratio is influenced by streambank stability and peak flows. Unstable streambanks exposed to high water flows can result in a widened stream channel.

No Action Alternative: Under the No Action Alternative, the width/depth ration indicator tends toward not properly functioning and therefore, the No Action Alternative will degrade the existing habitat conditions in both the near and long term.

Although rip-rap is common throughout the basin, bank stability along many unarmored stream segments is low (Kerwin 2001; May 1996; Scott et al. 1982). High peak flows are common in the Kelsey Creek basin and could result in a wider channel, increasing the width/depth ratio.

Regulatory Alternative: Under the Regulatory Alternative, the width/depth ratio indicator tends toward not properly functioning and therefore, it will degrade the existing habitat conditions in both the near and long term. Increased setbacks are not expected to prevent the episodes of bank erosion or the occurrence of wider stream reaches due to high peak flows.

City Programs Alternative: Under the City Programs Alternative, the width/depth indicator would be maintained at its current status (i.e., properly functioning) both in the near and the long term.

Instream rehabilitation programs and stream channel modification projects will increase channel depth and decrease channel width resulting in improvements to the width/depth ratio. Additionally, regional pond dredging, stormwater pond retrofitting, and stream riparian and wetland acquisition programs will help to decrease peak flows by providing additional floodwater storage. Bank stabilization projects and vegetated streambanks could control or prevent erosion along streams.

BAS Based Alternative: Under the BAS Based Alternative, the width/depth indicator will be maintained at its current status (i.e., properly functioning) in the near and long term.

5.4.2 Streambank Conditions

The streambank conditions are not properly functioning. Properly functioning streams are characterized as having greater than 90 percent stable streambanks. Stream surveys within segments of Valley Creek and the Kelsey Creek subbasins document stream banks greater than 90 percent stability (Herrera 2001b, 2002). However, bank stability in some segments is due to rip-rap. Steambanks stabilized with rip-rap lack natural stream bank functions. Natural elements described in the literature as influencing the stability of streambanks include the cohesive, frictional, and interlocking properties of soil; riparian vegetative characteristics; and an abundance of streambank roots (Castelle and Johnson 2000).

No Action Alternative: Under the No Action Alternative, the risk to the current status of the streambank conditions indicator is unknown in the short and long term. Stormwater control and vegetated buffers affect the amount and rate of runoff flowing into streams during storm events. Without adequate stormwater operation and maintenance, stormwater runoff to a stream can increase dramatically. These increased flows can destabilize the streambanks and cause them to erode, even if the banks are well-vegetated. Whether are not streambanks remain stable depends on the level of additional development in the upper watershed and the flow rate of stormwater runoff which enters the steam channel. Current code regulations do not limit discharges rates to streams from single-family development.

Regulatory Alternative: Under the Regulatory Alternative, the risk to the current status of the streambank conditions indicator is unknown in the near and long term.

The existence of riprap armoring along many reaches of Bellevue's streams creates uncertainty as to the potential effect of this alternative on streambank conditions and uncontrolled stormwater peak flows may continue to affect unarmored stream reaches. Impervious surface limits would be established for all land use districts thus increasing the potential for implementation of LID technologies. Also, if the proposed development involves discharge of pollutants to waters of the state, the Clean Water Act requires Section 401 Certification and a

National Pollutant Discharge Elimination System (NPDES) permit. However, these regulations only apply to redevelopment and new development projects. All of Bellevue's basins have a moderate to high level of total impervious area due to past development in the city. Cover by impervious surfaces in some of the city's drainage basins exceeds 60 percent, posing substantial challenges for restoring pre-development hydrologic characteristics (Bellevue 2003b). In the near term, only 310 acres, or 1.5 percent of Bellevue, is expected to be redeveloped and its stormwater systems retrofitted to better standards. Therefore, the benefits of this retrofit are not likely to significantly improve conditions.

City Programs Alternative: Under the City Programs Alternative, the streambank conditions will have a neutral effect in the near and long term. Rip-rap stabilized banks along Bellevue's streams are likely to persist over time; however, the City Programs Alternative will address bank stabilization concerns and further improve the existing conditions for this indicator at the reach scale. However, the alternative will only maintain conditions at the basin scale.

BAS Based Alternative: Under the BAS Based Alternative, the streambank indicator will be maintained at its current status (i.e., not properly functioning) in the near and long term. Given the degree of development along Bellevue's stream banks, it is unlikely that existing riprap will be removed from most stream reaches. Riprap stabilized banks along Bellevue's streams are likely to persist overtime. Nonetheless, the BAS Based Alternative will address bank stabilization concerns and further improve the existing conditions, at the reach scale.

5.4.3 Floodplain Connectivity

Baseline conditions for floodplain connectivity are at risk. Properly functioning streams exhibit floodplains that are frequently hydrologically linked to the main channel through overbank flows (NMFS 1996). Rip-rap banks constrain and prevent channel migration and overland flows within floodplains along many stream segments throughout the Kelsey Creek basin (Bellevue 2003b; May 1996).

No Action Alternative: Under the No Action Alternative, the floodplain connectivity indicator tends toward not properly functioning and therefore, the No Action Alternative will degrade existing habitat conditions in both the near and long term. The current regulatory code (LUC 20.25H.110.A6) allows development and land uses within floodplains areas such as the filling of small riparian wetlands and bank armoring which reduce floodplain connectivity.

Regulatory Alternative: The Regulatory Alternative would maintain the current status of the floodplain connectivity indicator in the near and long term. Minimal development within riparian and floodplain areas will occur under the Regulatory Alternative. The proposed code defines the channel migration zone as a portion of the floodplain and excludes structures, utilities, and other improvements within the 100-year floodplain or frequently flooded areas (LUC 20.25H.110.A6.1). For development with no buildable area outside of the floodplain, low impact development strategies would be used to reduce impacts to the hydrologic link of streams to floodplains.

City Programs Alternative: In the near term, the City Programs Alternative will maintain the current status of the floodplain connectivity indicator. In the long term, the City Programs Alternative moves the floodplain connectivity indicator toward properly functioning conditions by improving stream riparian conditions. Capital improvement projects that acquire land and provide for a reconnection and protection of riparian wetlands and side channel habitat to the main channel will improve floodplain connectivity.

BAS Based Alternative: Under the BAS Based Alternative, the floodplain connectivity indicator will be maintained at its current status in the near term. In the long term, the BAS Based Alternative moves the floodplain connectivity indicator toward properly functioning conditions for the same reasons previously presented for the temperature and pool frequency indicators. Therefore, the BAS Based Alternative will improve refugia conditions in the long term.

5.5 Flow and Hydrology

5.5.1 Change in Peak/Base Flows

The change in peak and base flows indicator is not properly functioning. The high percentage of impervious surfaces within the Kelsey Creek basin creates high peak flows during storm events. An analysis comparing flows during peak storm events from 1961-1975 to 1961-1983 concluded that the mean peak discharges in Kelsey Creek had increased 1.5 to 1.8 times higher than instantaneous peak discharges before 1983 (Kerwin 2001). The University of Washington and the U.S. Geological Survey compared the base flow and storm flow conditions of Kelsey Creek to an undisturbed stream system (Perkins 1982; Richey et al. 1981). Summer flows were 30 percent higher in the undistributed system compared to Kelsey Creek on a unit area basis. The undistributed system also responded to storm events slower than Kelsey Creek (Richey et al. 1981). Wetherbee (2000) found that 7-day low flows and peak daily flows are increasing in mainstem Kelsey Creek. Changes in base flows may also be due to increases in irrigation by land owners in the basin (Bellevue 2003a).

No Action Alternative: Under the No Action Alternative the peak/base flows indicator tends toward not properly functioning and therefore, the No Action Alternative will degrade the existing habitat conditions in both the near and long term. Land uses, development, and stormwater management activity within the watershed, which have resulted in changes to peak/base flows, would continue to occur.

Regulatory Alternative: The Regulatory Alternative would have a neutral effect on the current status of the peak/base flow indicator in the near and long term. The proposed regulatory amendments include setting impervious surface limits for development activities. Peak flows within streams are expected to remain at their current levels during storm events if impervious surface areas do not increase. The regulatory alternative will result in continued degradation of existing conditions in the near and long term.

City Programs Alternative: Under the City Programs Alternative, the status of the change in peak/base flows indicator will be maintained in the near and improve in the long term. The severity and frequency of high flow events are likely to decrease with improved retention and release of floodwater in the city's facility through retrofitting and increasing the maintenance of existing stormwater operations. Additionally, the frequent dredging of stormwater ponds could restore flood storage to design conditions and would be an improvement over current conditions. The wetlands stewardship program could promote the conservation of wetlands functions to store and release water on private property by establishing agreements not to fill, drain, or dredge wetlands. Under the acquisition program, the city's management of setbacks could return streamside areas to native forest conditions and thereby improve water infiltration to soils. Impervious areas within the basin can be reduced by working with existing landowners during redevelopment to incorporate strategies to reduce impervious area using various LID methods, such as replacing pavement with more porous materials or forest landscape.

BAS Based Alternative: Under the BAS Based Alternative, the risk to the current status of the change in peak/base flows indicator will be maintained in the near given the existing degree of development and will improve in the long term.

All of Bellevue's basins have a moderate to high level of total impervious area due to past development in the city. Cover by impervious surfaces in some of the city's drainage basins exceeds 60 percent, posing substantial challenges for restoring pre-development hydrologic characteristics (Bellevue 2003b). In the near term, only 310 acres, or 1.5 percent of Bellevue, is expected to be redeveloped and its stormwater systems retrofitted to better standards. Therefore, the benefits of this retrofit will maintain this indicator in the near term but would improve it in the long term as redevelopment occurs.

5.5.2 Increase in Drainage Network

The drainage area network indicator is not properly functioning. An increase in the natural drainage network of streams has occurred due to the construction of road, ditches, culverts, retention and detention ponds, and stormwater pipes within the basin (Bellevue 2003b).

No Action Alternative: Under the No Action Alternative, the risk to the current status of the increase in drainage network indicator is unknown in the near and long term. The existing city regulations do not address changes in the existing drainage network.

Regulatory Alternative: Under the Regulatory Alternative, the risk to the current status of the increase in drainage network indicator is unknown in the near and long term. The Regulatory Alternative does not address changes in the existing drainage network.

City Programs Alternative: Under the City Programs Alternative, the risk to the current status of the increase in drainage network indicator is unknown in the near and long term. Nonetheless, localized improvements are expected to occur. Several drainage and stormwater management and maintenance activities will increase over current levels under the City Programs Alternative.

A drainage master plan will be revised or developed with objectives to provide an increase in drainage network capacity and in flood storage and improvements in natural channel conditions to establish equilibrium for flows.

BAS Based Alternative: Under the BAS Based Alternative, the risk to the current status of the change in increase in drainage network indicator is unknown in the near and long term given the existing degree of development.

5.6 Watershed Conditions

5.6.1 Road Density and Location

The road density indicator is not properly functioning. The Kelsey Creek watershed is urbanized and highly developed (Bellevue 2003b). Properly functioning streams have no valley bottom road and basin-wide road densities less than 2 miles per square mile area. Road densities are in excess of 3 miles per square mile within the Kelsey Creek basin.

No Action Alternative: The No Action Alternative will have a neutral effect on the current status of the road density and location indicator in the near and long term. The watershed is considered to have reached built-out conditions therefore future development will be predominantly redeveloping existing properties and not result increases in the number of roads (Kerwin 2001). The No Action Alternative will continue existing degraded conditions.

Regulatory Alternative: The Regulatory Alternative will maintain the current status of the road density and locations indicator in the near and long term. Minimal development and land-use within riparian and floodplain areas would occur under the Regulatory Alternative. The proposed code defines the channel migration zone as a portion of the floodplain and excludes improvements within the 100-year floodplain (LUC 20.25H.110.A6.1). The existing conditions of the indicator are expected to be maintained because the basin is considered at build-out conditions and no new road will be build within valley bottoms under this alternative.

City Programs Alternative: The City Programs Alternative will have a neutral effect on the current status of the road density and location indicator in the near and long term and will continue existing degraded conditions. As previously stated, the Kelsey Creek basin is considered at built-out conditions.

BAS Based Alternative: Under the BAS Based Alternative the road density and location indicator will have a neutral effect on the current status (i.e., not properly functioning) of this indicator in the near and long term, because the city is largely built out and no new roads will be built or existing roads removed within valley bottoms under this alternative. The BAS Based Alternative will continue existing degraded conditions.

5.6.2 Disturbance History

The disturbance history indicator is not properly functioning. The city's watersheds have been extensively disturbed by urbanization, which has directly and indirectly disturbed stream habitat. Urban disturbance is distributed throughout the city's watersheds and includes unstable areas, refugia, and riparian areas.

No Action Alternative: Under the No Action Alternative, the disturbance history indicator tends toward not properly functioning conditions in the near and long term. Disturbance within the watershed would likely continue to occur within and adjacent to streams resulting in continued degraded conditions.

Regulatory Alternative: The Regulatory Alternative would maintain the current not properly functioning status of the disturbance history indicator in the near term and improve it in the long term. This alternative will avoid development within unstable slopes, refugia, and riparian corridors through setbacks and land-use restrictions. Preventing human encroachment will preserve existing native riparian vegetation and refugia in the long term as redevelopment occurs.

City Programs Alternative: Under the City Programs Alternative, the disturbance history indicator tends toward not properly functioning conditions in the near term. Acquisitions and stewardship programs could protect existing vegetated riparian areas from disturbances. Additionally, restoration of stream segments could provide incremental local improvements in habitat conditions over the long term. However, these programs are not expected to reverse conditions of disturbances within the city's basin. Disturbances within riparian areas are expected to continue due to human intrusion and encroachment from existing properties within riparian areas in the near and long term.

BAS Based Alternative: Under the BAS Based Alternative, the disturbance history indicator tends toward not properly functioning and therefore will degrade the existing habitat conditions in the near term. In the long term, the current status of the disturbance history indicator will improve in the long term as redevelopment occurs.

5.6.3 Riparian Reserves

The riparian reserves indicator is not properly functioning. Properly functioning streams have riparian reserves which provide adequate shade, LWD recruitment, and habitat protection and connectivity in all subbasins (NOAA Fisheries 1996). All subbasins in the Kelsey Creek Basin have disrupted riparian conditions due to residential development, road crossings, and commercial development (Bellevue 2003b). Modified riparian conditions throughout the basin reduce LWD recruitment and connectivity of stream critical areas. A 1996 study found less than 5 percent mature riparian forests remaining along the mainstem of Kelsey Creek (May 1996). Riparian vegetation along Sturtevant Creek has been degraded by impervious surface, ornamental vegetation, and manicured lawns. Similarly, commercial development has resulted in highly modified riparian areas in the headwaters of Richards Creek and East Creek. The

riparian corridors of Sunset, Richards, and East Creeks are modified in the vicinity of Interstate 90 by road complexes and business parks (Bellevue 2003b). The lack of mature native forest conditions along the majority of the lengths of the streams located within the basins means that many of the habitat functions and values of the riparian corridor are reduced from a properly functioning condition.

No Action Alternative: Under the No Action Alternative, the riparian reserves indicator tends toward not properly functioning conditions in the near and long term. Riparian areas could continue to face encroachment from development and urbanization in the city's subbasins and result in continued degradation of the existing condition of the riparian reserves indicator in the near and long term.

Regulatory Alternative: The Regulatory Alternative will maintain the existing status of the riparian reserves indicator in the near and long term. Setbacks would limit the removal of the existing riparian vegetation from new development but it is not expected to improve this indicator in the near and long term.

City Programs Alternative: Under the City Programs Alternative, the riparian reserves indicator tends toward not properly functioning and is expected to continue degradation of existing habitat conditions in both the near and long term. Programs that initiate invasive and noxious weed control and establish native riparian vegetation could locally improve riparian habitat along stream segments. These local improvements will not provide connectivity between subbasins given the current degree of development.

BAS Based Alternative: Under the BAS Based Alternative, the riparian reserves indicator tends toward not properly functioning and therefore will degrade the existing habitat conditions in the near term. In the long term, the risk to the current status of the disturbance history indicator is unknown, given the existing degree of development which limits establishment of habitat connectivity within and between subbasins. Nonetheless, localized improvements will be expected with the implementation of the BAS Based Alternative.

5.6.4 Natural Disturbances

The natural disturbances indicator is functioning at risk. Urban development within the city of Bellevue has altered the frequency and magnitude of disturbance events for stream critical areas. Land uses such as short grass lawns suppress the natural processes that maintain diversity (Bellevue 2003b). Currently land management practices alter the natural disturbance regime of landslides, flooding, and fires from natural conditions. Natural disturbances are prevented or retarded for safety reasons. LWD is commonly removed from streams to reduce perceived hazards associated with flooding and fires occurring in forested areas extinguished. Roads and land use zoning have altered the scale of natural disturbances by making them smaller, less frequent and less intense.

No Action Alternative: Under the No Action Alternative, the risk to the current status of the natural disturbances indicator is unknown in the near and long term. The existing city code land-use codes do not address the regulation of disturbance regimes. Alterations to natural disturbance processes will continue to occur due to concerns for human safety and to protect land uses.

Regulatory Alternative: Under the Regulatory Alternative, the risk to the current status of the natural disturbances indicator is unknown in the near and long term. Although setbacks would limit the removal of riparian vegetation and maintain the existing conditions of riparian vegetation, existing development within the watershed could continue to impede natural disturbances. The Regulatory Alternative does not address natural disturbances; therefore, the risk to existing conditions for the natural disturbance indicator is unknown.

City Programs Alternative: Under the City Programs Alternative, the risk to the current status of the natural disturbances indicator is unknown in the near and long term. The City Programs Alternative does not address natural disturbances; therefore, the risk to existing conditions for the natural disturbance indicator is unknown.

BAS Based Alternative: In the near and long term, the effect of the BAS Based Alternative on the current status of the natural disturbances indicator is unknown, given the existing degree of development which limits opportunity for natural disturbance processes.

5.6.5 Total Impervious Area

The total impervious area (TIA) indicator is not properly functioning. TIA ranges from 30 to 68 percent within Kelsey Creek's subbasins. Sears and Sturtevant Creek subbasins have the highest TIA, while the Valley and Goff Creek subbasins have the lowest TIA (Bellevue 2003b). Properly functioning streams have less than 10 percent TIA (May et al. 1997).

No Action Alternative: Under the No Action Alternative, the TIA indicator tends toward not properly functioning conditions and therefore, the No Action Alternative will degrade the existing habitat conditions in both the near and long term. Bellevue's existing LUC does not set impervious surface limits for land use; therefore TIA would likely increase within the basin.

Regulatory Alternative: The Regulatory Alternative will have a neutral effect on the existing status of the TIA indicator in the near and long term. Baseline conditions for TIA would remain unchanged or increase slightly with the impervious surface area limits added to the city's LUC. Only a small increase in TIA is expected since the city's basins are largely at built-out conditions and future development will be predominantly redevelopment of existing properties. The Regulatory Alternative is expected to continue the degradation of existing conditions in the near and long term.

City Programs Alternative: Under the City Programs Alternative, the TIA indicator tends toward not properly functioning conditions in the near and long term.

All of Bellevue's basins have a moderate to high level of TIA due to past development in the city. Cover by impervious surfaces in some of the city's drainage basins exceeds 60 percent, posing substantial challenges for restoring pre-development hydrologic characteristics (Bellevue 2003b). City-sponsored stewardship programs could prevent increases in TIA or reduce existing levels of imperviousness within the basin by providing incentives to landowners. Additionally, TIA could also be reduced by educating landowners during redevelopment to incorporate strategies to reduce impervious area such as replacing pavement with more porous materials. In the absence of regulations, stewardship programs are not expected to prevent additional increases in TIA, therefore existing degraded conditions will remain.

BAS Based Alternative: Under the BAS Based Alternative, the TIA indicator tends toward not properly functioning and therefore the existing habitat conditions will continue to be degraded in the near term. In the long term, the risk to the current status of the TIA indicator is unknown, given the existing degree of development. Nonetheless, localized improvements will be expected with the implementation of the BAS Based Alternative, for the same reasons presented for the water temperature indicator.

5.6.6 Riparian Breaks

The riparian break indicator is functioning at risk. The longitudinal integrity of riparian corridors is fragmented by residential development, road crossings, and commercial development. TIA within 100 feet of streams is greater than 40 percent in the Goff Creek, Sears Creek and Sturtevant Creek subbasins. Within other subbasin, TIA within 100 feet of the stream channel ranges from 6 percent along Mercer Slough to 31 percent along Sunset Creek (Bellevue 2003b). Properly functioning streams have less than 10 percent TIA within 100 feet of the stream channel (May et al. 1997).

No Action Alternative: Under the No Action Alternative, the riparian breaks indicator tends toward not properly functioning conditions in the near and long term. Currently, riparian buffers are regulated through the city's riparian corridors (LUC 20.25.H.70.A2). Riparian corridor setback from the top of bank include: 50 feet for Type A corridors; 25 feet for Type B corridors; and 10 feet for Type C corridors. Uses within riparian corridor setbacks allowed under existing land-use regulations (LUC 20.25H.080B) such as parks and utility facilities have the potential to create additional riparian breaks within 100 feet of the stream channel. The existing conditions of riparian longitudinal connectivity within 100 feet of streams will continue to be degraded by the No Action Alternative.

Regulatory Alternative: The Regulatory Alternative will maintain the existing status of the riparian breaks indicator in the near and long term. Land-use regulations which designate the level of the setback are based on stream typing. Setbacks under the Regulatory Alternative include: 100 feet for Type S streams; 100 feet for Type F streams; 50 feet for Type N streams; and 25 feet for Type O streams. Over 50 percent of Bellevue's streams support fish and would be assigned a 100-foot setback (Bellevue Streams Inventory 2003b). The Regulatory Alternative will likely maintain the baseline longitudinal integrity of the riparian corridor in the near and

long term. Uses within the riparian corridor could still occur under land-use regulation LUC 20.25H.080B which allows uses of setbacks for utilities and parks.

City Programs Alternative: Under the City Programs Alternative, the riparian breaks indicator tends toward not properly functioning conditions in the near and long term. Educational and outreach programs coupled with the existing regulatory codes would result in continued degradation of existing conditions for riparian breaks. The riparian break indicator considers TIA within 100 feet of stream channels. The existing land-use regulations for setbacks apply to activity within 50 feet or less of a stream channel. Because the existing regulations only apply to activity within 50 feet of a stream TIA is likely to increase within 100 feet of streams due to development and redevelopment of properties.

BAS Based Alternative: Under the BAS Based Alternative, the riparian breaks indicator tends toward not properly functioning and therefore the existing habitat conditions will be degraded in the near term. In the long term, the risk to the current status of the riparian breaks indicator is unknown, given the existing degree of development. Nonetheless, localized improvements will be expected with the implementation of the BAS Based Alternative for the same reasons presented for the water temperature indicator.

5.7 Conclusion

Many indicators of existing environmental conditions of Bellevue's streams are not properly functioning, according to the NMFW (1996) criteria and based on best available science (Bellevue 2003a; Herrera 2005). The risk analysis performed on the proposed Bellevue's critical areas update indicates that although the Regulatory Alternative, the City Programs Alternative, and the BAS Based Alternative may lessen the current trend of degradation of critical areas, none of the alternatives would change the trajectory in a positive, or restorative, direction for all the indicators (Table 5-2). Consequently, in the near and long term, the overall stream conditions would continue to degrade under either alternative. The city should consider a combination of the Regulatory and the City Programs alternatives to maintain or improve stream and riparian area indicators.

Table 5-2. Streams environmental baseline and risk analysis matrix.

Pathways and Indicators		Existing Environmental Baseline Conditions			Risk Analysis Results															
					No Action Alternative				Regulatory Alternative				City Programs Alternative				BAS Based Alternative			
Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning	PFC	NPC	N	U	PFC	NPC	N	U	PFC	NPC	N	U	PPC	NPC	N	U
Water Quality:	Temperature		X			ST/LT				ST/LT			LT	ST			LT	ST		
	Sediment/Turbidity			X		ST/LT				ST/LT				ST/LT			LT	ST		
	Chemical Contamination or Excess Nutrients		X			ST/LT				ST/LT				ST/LT			LT	ST		
Habitat Access:	Physical Barriers			X			ST/LT				ST/LT		LT		ST		LT	ST		
Habitat Elements:	Substrate		X			ST/LT				ST/LT				ST/LT				ST/LT		
	Large Woody Debris			X		ST/LT					ST/LT		ST/LT				ST/LT			
	Pool Frequency: channel width # pools/mile 5 feet 184 10 feet 96 15 feet 70 20 feet 56 25 feet 47 50 feet 26 75 feet 23			X		ST/LT				ST/LT				ST/LT			ST/LT			
	Pool Quality*			X		ST/LT					ST/LT		ST/LT				ST/LT			
	Off-channel Habitat		X				ST/LT				ST/LT		LT		ST		LT		ST	
	Refugia (important remnant habitat for sensitive aquatic species) *		X			ST/LT					ST/LT		LT		ST		LT		ST	
Channel Condition & Dynamics:	Width/Depth Ratio	X				ST/LT				ST/LT					ST/LT				ST/LT	
	Streambank Condition			X				ST/LT				ST/LT			ST/LT				ST/LT	
	Floodplain Connectivity		X			ST/LT					ST/LT		LT		ST		LT		ST	
Flow/ Hydrology:	Change in Peak/Base Flows			X		ST/LT					ST/LT					ST/LT				ST/LT
	Increase in Drainage Network*			X				ST/LT				ST/LT				ST/LT				ST/LT
Watershed Conditions:	Road Density & Location*			X			ST/LT				ST/LT				ST/LT				ST/LT	
	Disturbance History*			X		ST/LT			LT		ST			ST/LT			LT		ST	

Table 5-2 (continued). Streams environmental baseline and risk analysis matrix.

Pathways and Indicators		Existing Environmental Baseline Conditions			Risk Analysis Results															
					No Action Alternative				Regulatory Alternative				City Programs Alternative				BAS Based Alternative			
Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning	PFC	NPC	N	U	PFC	NPC	N	U	PFC	NPC	N	U	PPC	NPC	N	U
Watershed Conditions (continued):	Riparian Reserves			X		ST/LT					ST/LT			ST/LT				ST		LT
	Natural Disturbances		X					ST/LT				ST/LT				ST/LT				ST/LT
	Total Impervious Area (TIA)			X		ST/LT					ST/LT			ST/LT				ST		LT
	Riparian Breaks		X			ST/LT					ST/LT			ST/LT				ST		LT

Source: Adapted from Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale (NOAA Fisheries 1996).
Notes:
*Watershed-scale data is limited, therefore data at the reach-scale maybe used for risk analysis.
ST: Short-term.
LT: Long-term.
PFC: Tends toward properly functioning condition.
NPC: Tends toward not properly functioning condition.
N: Neutral.
U: Unknown.
X: Existing condition.

6.0 Environmental Conditions and Risk Analysis for Wetlands

This chapter provides a discussion of Bellevue's existing wetland environmental conditions and an analysis of the expected environmental risk associated with the implementation of the proposed critical areas update alternatives. The risk analysis is based on best available science and includes an assessment of existing environmental conditions, and a comparison of the expected effects of a No Action, a Regulatory, and a City Programs alternative on wetland conditions in the city. The risk analysis includes a discussion of the near term (5 years) and long term (50 years) environmental effects of each of the three alternatives. The criteria used for this risk analysis were adapted for wetlands from *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFW 1996). Existing environmental conditions and the selected criteria are summarized in Table 6-1.

Westside riparian-wetland and other habitat areas in the city of Bellevue are surrounded by urban development. Roads and urban development separates large habitat areas throughout the city. Many of the riparian systems have disturbed and altered stream channels that are negatively affected by a lack of large woody debris and native vegetation cover, altered stream hydrology, and water quality problems. Substantial portions of Sturtevant Creek, Goff Creek, Valley Creek, and Sears Creek have been piped (see Section C, Stream Inventory, for additional discussion). The city's landscape is a matrix of high and medium intensity urban development.

Mercer Slough is considered by the U.S. Environmental Protection Agency to be a wetland of national importance, and it is considered a shoreline of state-wide significance by the state Shoreline Management Act. It is a regionally significant wetland, the largest wetland area in Bellevue, which provides habitat to a large number of species (likely the highest diversity of species in Bellevue), many of which are special status species (City of Bellevue 1990).

6.1 Water Regime

6.1.1 Average Water Level Fluctuation

Rapid water level fluctuations can be detrimental to birds and amphibians breeding in or near shallow water areas and can affect the diversity of plant species inhabiting a wetland (Azous and Horner 2001). Stormwater runoff from new urban development and from existing urban areas contributes to alterations in wetland hydroperiods that result in wildlife habitat loss and degradation of wetland resources in this basin.

No Action Alternative: The No Action Alternative would maintain the not properly functioning status of the average water level fluctuation indicator in the near and long term as no changes in land development practices would occur. The No Action Alternative will continue to degrade protection for wetland functions in the near and long term.

Table 6-1. Wetlands risk criteria.

Pathway	Indicator	Properly Functioning	At Risk	Not Properly Functioning
Water Regime	Average Water Level Fluctuation	0.1 to 1.54 foot average annual water level fluctuation [a]		> 1.54 foot average annual water level fluctuation [a]
	Watershed Impervious Area	< 10% impervious area in watershed [b]	10 - 30% impervious area in watershed [b]	>30% impervious area in watershed [b]
Water Quality	Conductivity	< 100 µS/cm [c]		> 100 µS/cm [c]
	Total Phosphorus (TP)	20-50 µg/L [c]		> 50 µg/L [c]
	Total Suspended Solids (TSS)	2-5 mg/L [c]		> 5 mg/L [c]
	NH_3-N	<50 µg/L [c]		> 50 µg/L [c]
	Zinc (Zn)	< 10 µg/L [c]		> 10 mg/L [c]
Habitat	Coverage of Non-Native Species	< 15% Coverage of non-native species in wetlands. [a]		> 15% Coverage of non-native species in wetlands. [a]
	Wetland Area (acres)	Equal or greater wetland area per year.		Less wetland area per year.
	Area of Upland Habitat Adjacent to a Wetland	Increased acres of buffers, Native Growth Protection Areas (NGPA), Retained Vegetation Areas (RVA) and Other city Owned Property that is undeveloped.		Decreased acres of buffers, Native Growth Protection Areas (NGPA), Retained Vegetation Areas (RVA) and Other city Owned Property that is undeveloped.
Physical Modifications	Acres of Wetlands Filled	Decreased acres of wetlands filled per year.		Increased acres of wetlands filled per year.

[a] Azous, A.L, M.B. Bowles, and K.O. Richter. 1998. Reference Standards and Project Performance Standards for the Establishment of Depressional Flow-Through Wetlands in the Puget Lowlands of Western Washington. King County Department of Development and Environmental Services, Renton, Washington.

[b] Horner, R.R., D.B. Booth, A. Azous, and C.W. May. 1996. Watersheds Determinants of Ecosystem Functioning. *In* Effects of Watershed Development and Management on Aquatic Ecosystems. Proceedings of an Engineering Foundation Conference, Edited by L.A. Roesner, pp 251-274, American Society of Civil Engineers, New York.

[c] Azous, A.L. and R.R. Horner (editors). 2001. Wetlands and Urbanization: Implications for the Future. CRC/Lewis Press, Boca Raton, Florida.

Regulatory Alternative: The Regulatory Alternative affecting wetlands will rely on increasing buffer widths and improving the standards for allowed alterations to wetlands and buffers and to mitigation ratios and requirements**.** New limits on impervious surfaces and incentives for using low impact development practices will be implemented. The Regulatory Alternative will improve properly functioning conditions in the long term as redevelopment occurs but not in the near term due to past development practices. The Regulatory Alternative will improve protection for wetland functions in the long term and will result in continued degradation in the near term.

City Programs Alternative: The City Programs Alternative would include acquiring lands that would increase the area of protected wetlands and buffers, increasing current levels of effort for stewardship, education, and outreach programs with an action component to involve schools, neighborhoods, and businesses in the protection and restoration of habitat. The City Programs Alternative would maintain the not properly functioning status of the average water level fluctuation indicator in the near and long term as no requirements for decreasing impervious area or managing stormwater flows to protect wetland hydroperiods are proposed.

BAS Based Alternative: The BAS Based Alternative would improve regulations protecting water discharged to wetlands, improve maintenance of stormwater facilities, implement mitigation to reduce water level fluctuation, and develop effective educational and stewardship programs directed at reducing non-point source pollutants. This alternative would result in continued degraded conditions in the near term but would improve conditions in the long term.

6.1.2 Watershed Impervious Area

Large amounts of impervious surfaces in the urban matrix increase surface water runoff, causing rapid and high water level fluctuations, especially in the smaller and more constrained portions of the city's riparian-wetland habitats. Examples of likely problem areas include riparian-wetland habitat associated with Valley Creek, Richards Creek, and constrained portions of Kelsey Creek.

No Action Alternative: The No Action Alternative would maintain the not properly functioning status of the watershed impervious area indicator in the near and long term as no changes in land development practices would occur. The No Action Alternative will continue to degrade protection for wetland functions in the near and long term.

Regulatory Alternative: The Regulatory Alternative affecting wetlands implements new limits on impervious surfaces and incentives for using low impact development practices. The Regulatory Alternative will improve properly functioning conditions in the long term as redevelopment occurs but not in the near term due to past development practices. The Regulatory Alternative will improve protection for wetland functions in the long term and will continue degraded conditions in the near term.

City Programs Alternative: The City Programs Alternative would include acquiring lands that would increase the area of protected wetlands and buffers, increasing current levels of effort for stewardship, education, and outreach programs that will involve schools, neighborhoods, and

businesses in the protection and restoration of habitat. The City Programs Alternative would maintain the not properly functioning status of the watershed impervious area indicator in the near and long term as no requirements for decreasing impervious area or managing stormwater flows to protect wetland hydroperiods are proposed.

BAS Based Alternative: The city's proposed regulatory measures to limit impervious surfaces and incentives for using low impact development practices meet BAS recommendations for improving management of water level fluctuations. The BAS Based Alternative will improve properly functioning conditions in the long term as redevelopment occurs but not in the near term due to past development practices. The BAS Based Alternative will improve protection for wetland functions in the long term and will maintain existing degraded conditions in the near term.

6.2 Water Quality

Roads and urban development separate large wetland areas in this basin. Many of the riparian and associated wetland systems are disturbed and altered and have been negatively affected by a lack of large woody debris and native vegetation cover, altered wetland hydrology, and water quality problems. Continued urban development in and adjacent to remaining lowland forest and riparian-wetland areas will continue to contribute to water quality problems, aquatic habitat loss, and degradation in this basin. Water quality indicators found to be indicative of wetland health include conductivity, total phosphorus, total suspended solids, nitrogen ammonia (NH_3-N), and zinc (Azous and Horner 2001).

No Action Alternative: The No Action Alternative would maintain the not properly functioning status of the water quality indicators in the near and long term as no changes in land development practices would occur. The No Action Alternative will continue to degrade protection for wetland water quality in the near and long term.

Regulatory Alternative: The Regulatory Alternative affecting wetland water quality will impose increased performance standards for runoff discharged to wetlands. The Regulatory Alternative would maintain the not properly functioning status of the water quality indicators in the near term and improve properly functioning conditions in the long term as redevelopment occurs. The Regulatory Alternative will continue to degrade protection for wetland functions in the near term for all water quality parameters and improve protection in the long term for total phosphorus, total suspended solids, and zinc.

City Programs Alternative: The City Programs Alternative would include programs to clean catchbasins and maintain oil/water separators to improve water quality conditions in wetlands and streams. These measures will have an immediate effect, primarily on particulate bound total phosphorus and zinc, and total suspended solids (TSS). These measures are not likely to improve conductivity or nitrogen. The City Programs Alternative will improve water quality in

wetlands in the near and long term for total phosphorus, TSS, and zinc, but not for conductivity or nitrogen.

BAS Based Alternative: The city's proposed regulatory measures to impose increased performance standards for runoff and restrictions on pesticides meet BAS recommendations for improving management of water quality. The city's programmatic initiatives to increase education and stewardship efforts meet BAS standards as do the city's programs to clean catchbasins and maintain oil/water separators to improve water quality conditions in wetlands and streams. The BAS Based Alternative will improve properly functioning conditions in the long term as redevelopment occurs and in the near term as maintenance of stormwater facilities is improved. Overall, the BAS Based Alternative will improve water quality in wetlands in both the near and long term.

6.3 Habitat

6.3.1 Coverage of Non-Native Species

Human disturbances in habitat areas can increase the spread of non-native invasive plants. Invasive non-native plants are already well established in Kelsey Creek wetlands including Japanese knotweed, reed canarygrass, and Himalayan blackberry. Invasive, non-native plant species can rapidly supplant natives and decrease populations of wildlife adapted to live in native habitats. Non-native invasive plants are continuing to displace native habitats in the Mercer Slough and Richards Creek riparian areas.

No Action Alternative: The No Action Alternative would continue the degradation of habitat and the not properly functioning status of the coverage of non-native species indicator in the near and long term as no changes in land development practices would occur. The No Action Alternative will continue to degrade wetland habitat functions.

Regulatory Alternative: The Regulatory Alternative will create an allowed use for habitat enhancement projects in buffers and setbacks for wetlands. The use of supplemental planting will be revised to allow for habitat enhancement and to support critical area improvement projects, subject to performance standards. Property owners will be able to suggest improvements to wetlands and buffers, such as enhancing native vegetation in return for increased flexibility in the amount of development allowed outside the wetland and its buffer.

The Regulatory Alternative would maintain the not properly functioning condition of the non-native species indicator in the near term and is likely to improve it in the long term. Although habitat enhancement will be allowed in setbacks and buffers, it is not required. The Regulatory Alternative will maintain existing conditions in the near term and improve them in the long term as redevelopment occurs.

City Programs Alternative: The City Programs Alternative includes stewardship programs and incentive programs to restore native habitats. In addition, the city would acquire at least 30 acres

of wetlands over a 50 year period that could be rehabilitated as needed. These initiatives would tend to maintain the current status of the non-native species indicator in the near term and tend to move the indicator towards properly functioning in the long term. The City Programs Alternative will continue existing degraded conditions in the near term and improve them in the long term as programs are implemented and acquisitions occur.

BAS Based Alternative: The city's proposed regulatory measures and the city's programmatic initiatives to increase education and stewardship efforts, acquire wetlands and buffers, and rehabilitate them as needed meet BAS standards. The BAS Based Alternative will improve properly functioning conditions in the long term as redevelopment occurs and wetlands are acquired. Properly functioning conditions will improve as educational and stewardship programs are implemented. Overall, the BAS Based Alternative will maintain existing degraded conditions in the near term and improve them in the long term as redevelopment occurs, programs are implemented, and lands are acquired.

6.3.2 Wetland Area

No Action Alternative: The No Action Alternative would maintain the not properly functioning status of the wetland area indicator in the near and long term as no changes in land development practices would occur. The No Action Alternative will continue to remove wetland habitat through development and further degrade wetland habitat functions.

Regulatory Alternative: The Regulatory Alternative affecting wetland area will increase buffer widths, increase setbacks, continue to allow enhancement of wetlands as mitigation for permanent losses as long as it is done in conjunction with wetland creation or restoration, allow modifications to wetlands and buffers under restricted conditions, and increase wetland mitigation requirements.

The Regulatory Alternative would maintain the not properly functioning status of the wetland area indicator in the near and long term as losses of small wetlands will still be permitted, although potentially at a lower rate. The Regulatory Alternative will continue to remove wetland habitat through development practices and therefore incrementally degrade the extent of remaining wetland habitat.

City Programs Alternative: The City Programs Alternative would include acquiring 30 acres of wetlands over 50 years and would increase the area of permanently protected wetland habitat. The City Programs Alternative will not likely affect current conditions in the near term but would tend to maintain the not properly functioning status of the wetland area indicator in the long term based on the implementation of the acquisition program designed to permanently protect wetlands. The City Programs Alternative will continue existing degraded conditions in the near term and maintain conditions in the long term.

BAS Based Alternative: In addition to the regulatory and programmatic measures proposed by the city, the BAS Based Alternative would improve requirements for documenting the losses and

gains in wetland functions, eliminate the use of enhancement for compensating wetland losses and would increase accountability for regulatory follow-up and enforcement. These measures would maintain the not properly functioning condition of wetland area in the near term and would move it towards properly functioning in the long term as redevelopment occurs. The BAS Based Alternative will maintain existing degraded conditions in the near term and improve conditions in the long term.

6.3.3 Area of Upland Habitat Adjacent to a Wetland

No Action Alternative: The No Action Alternative would maintain the not properly functioning status of the area of upland habitat adjacent to a wetland indicator in the near and long term as no changes in land development practices would occur. The No Action Alternative will continue to remove wetland buffers through development and further degrade wetland habitat functions.

Regulatory Alternative: The Regulatory Alternative affecting wetland area will increase buffer widths based on wetland functions and will allow modifications to wetlands and buffers under restricted conditions where a clear improvement in functions is shown.

The Regulatory Alternative would maintain the not properly functioning status of the area of upland habitat adjacent to a wetland indicator in the near term and improve it in the long term as redevelopment is subject to revised wetland buffer requirements. The Regulatory Alternative will maintain existing degraded conditions in the near term and improve them in the long term.

City Programs Alternative: The City Programs Alternative would include acquiring lands that would increase the area of permanently protected wetlands and buffers, increasing current levels of effort for stewardship, education, and outreach programs directed towards the protection and restoration of wetlands. In the near term, the City Programs Alternative is not likely to improve existing conditions to a measurable degree. The City Programs Alternative would tend to move the city towards a properly functioning status of the area of upland habitat adjacent to a wetland indicator in the long term based on the implementation of an acquisition program designed to permanently protect wetlands and improve landscape connectivity with other natural areas. The City Programs Alternative will maintain existing degraded conditions in the near term and help improve them in the long term.

BAS Based Alternative: The regulatory measures and city programs proposed by the city meet BAS recommendations for buffer protection. These measures would maintain the not properly functioning condition of wetland area in the near term and would move it towards properly functioning in the long term as redevelopment occurs. The BAS Based Alternative will maintain existing degraded conditions in the near term and improve conditions in the long term.

6.4 Physical Modifications

6.4.1 Acres of Wetlands Filled

No Action Alternative: The No Action Alternative would maintain the not properly functioning status of the acres of wetlands filled indicator in the near and long term as no changes in land development practices would occur. The No Action Alternative will continue to fill small wetlands for development and further degrade wetland functions.

Regulatory Alternative: The Regulatory Alternative will continue to allow filling of wetlands as long as long as the losses are at least partially mitigated by wetland creation or restoration. The Regulatory Alternative would maintain the not properly functioning status of the wetland fill indicator in the near and long term as losses of small wetlands will still be permitted, although potentially at a lower rate. The Regulatory Alternative will continue to remove wetland habitat through development practices and therefore further degrade the extent of the city's wetland habitats in the near and long term.

City Programs Alternative: The City Programs Alternative will not likely affect current conditions in the near term but would tend to move the city towards a properly functioning status of the wetland fill indicator in the long term based on the implementation of the acquisition program designed to permanently protect wetlands. The City Programs Alternative will maintain existing degraded conditions in the near term and improve conditions in the long term.

BAS Based Alternative: In addition to the regulatory improvements and city program strategies, BAS recommendations for this indicator suggest that jurisdictions should not allow fill within wetlands until a completed, successful mitigation project is in place. This is because the vast majority of mitigation projects are still poorly designed, maintained, and monitored. Mitigation continues to produce a net loss in wetland area, even when enforcement is provided. The BAS Based Alternative would improve current conditions in the near term and would tend to move the city towards a properly functioning status of the wetland fill indicator in the long term by not allowing wetland fills until completed successful mitigation projects have been constructed. The BAS Based Alternative will improve existing degraded conditions in the near term as well as the long term.

6.5 Conclusions

Table 6-2 summarizes the effect of each alternative on the wetland indicators characterizing existing conditions.

Table 6-2. Wetlands environmental conditions and risk analysis matrix.

Pathways and Indicators		Existing Environmental Conditions			Risk Analysis Results															
					No Action Alternative				Regulatory Alternative				City Programs Alternative				BAS Based Alternative			
Pathways	Indicators	Properly Functioning	At Risk	Not Properly Functioning	PFC	NPC	N	U	PFC	NPC	N	U	PFC	NPC	N	U	PFC	NPC	N	U
Water Regime	Average Water Level Fluctuation			X		NT/LT			LT		NT		LT		NT		LT		NT	
	Watershed Impervious Area			X		NT/LT			LT		NT		LT		NT		LT		NT	
Water Quality	Conductivity	X				NT/LT					NT/LT				NT/LT				NT/LT	
	Total Phosphorus (TP)		X			NT/LT			LT		NT		NT/LT				NT/LT			
	Total Suspended Solids (TSS)	X				NT/LT			LT		NT		NT/LT				NT/LT			
	NH_3-N		X			NT/LT					NT/LT				NT/LT				NT/LT	
	Zinc (Zn)			X		NT/LT			LT		NT		NT/LT				NT/LT			
Habitat	Coverage of Non-Native Species		X			NT/LT				NT/LT										
	Wetland Area (acres)			X		NT/LT					NT/LT		LT		NT			NT	LT	
	Area of Upland Habitat Adjacent to a Wetland			X		NT/LT			LT		NT		LT		NT		LT		NT	
Physical Modifications	Acres of Wetlands Filled			X		NT/LT					NT/LT		LT		NT		NT/LT			

PFC: Tends toward properly functioning condition.
NPC: Tends toward not properly functioning condition.
N: Neutral.
U: Unknown.

7.0 Environmental Conditions and Risk Analysis for Shorelines

This document provides a discussion of the environmental conditions of Bellevue's shorelines and an analysis of the expected environmental risk associated with proposed alternatives for updating critical areas protection. Environmental conditions are described based on a model using pathways and indicators, and the data is derived from a summary of two recent Best Available Science (BAS) reviews (Bellevue 2003; Herrera 2005). The risk analysis uses best available science (BAS) to determine the short term (5 years) and long term (50 years) environmental effects of each of four alternatives: No Action Alternative, Regulatory Alternative, City Programs Alternative, and a BAS Based Alternative.

The criteria used for this risk analysis were adapted from the draft *Lake Matrix of Pathways and Indicators for Lake Washington, Lake Sammamish, and the Ship Canal, including Lake Union* (NOAA Fisheries 2003), which was originally derived from *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFW 1996).

Bellevue's Shoreline Overlay District includes both lake shorelines (i.e., Lake Washington, Lake Sammamish and Phantom Lake) and stream shorelines (i.e., lower Kelsey Creek). However, the focus of this analysis is on lake shorelines and specifically emphasizes Lake Washington and Lake Sammamish.

Existing environmental conditions are characterized in the Shoreline Criteria Matrix (Table 7-1). The results of the risk analysis for each of the four alternatives are discussed below for each pathway and associated indicators.

7.1 Water Quality

7.1.1 Temperature/Dissolved Oxygen

Under existing conditions, the water temperature indicator in Lake Washington and Lake Sammamish is not properly functioning. According to King County (2002a) water quality data, portions of these lakes experience water temperature between 57.2^{o} to 60.8^{o} Fahrenheit (14^{o}-18^{o} Celsius) and bottom dissolved oxygen concentrations between 3 to 5 mg/l from late May through mid October. In fact, annual water temperatures along the shorelines of Lake Washington and Lake Sammamish typically exceed the range of water temperature preferred by juvenile Chinook and coho salmon (53.6^{o} to 57.2^{o} Fahrenheit [12^{o} to 14^{o} Celsius]; Brett 1952). In addition, surface water temperatures in the lakes have been steadily increasing, probably as a result of global warming (Kerwin 2001).

No Action Alternative: Under the No Action Alternative, near and long term water temperature in Lake Washington and Lake Sammamish will tend toward not properly functioning conditions. Therefore, the No Action Alternative will degrade existing shoreline habitat conditions.

Table 7-1. Shoreline criteria matrix.

Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning
Water Quality	Temperature/Dissolved Oxygen (DO)	At least 50% of water column is <14 C and >5mg/l [c]	Entire water column between 14-18 C and DO between 3-5 mg/l [c]	No portion of water column <18 C or DO less than 3 mg/l [c]
	pH	6.5-8.5 [a]	–	Does not met standards for properly functioning
	Chemical Contamination	Low levels of chemical contamination from agricultural, industrial or private residences, and watercraft, no creosoted or treated wood on site, no pesticide use [b]	Moderate levels of chemical contamination from agricultural, industrial or private residences and watercraft, low amount creosoted or treated wood on site, low amount pesticide use [b]	High levels of chemical contamination from agricultural, industrial or private residences and watercraft, medium to high amount creosoted or treated wood on site, medium to high pesticide use [b]
	Nutrients Total Phosphorous (TP)	No excess nutrients <10 ppm TP in epilimnion [b]	Some excess nutrients 10-15 TP in epilimnion [b]	High levels of excess nutrients >15TP in epilimnion [b]
Habitat Access	Physical Barriers	Fish passage is unimpeded into, through or out of lake at all lake levels [b]	Any man-made barrier that does not allow fish passage through the lake or upstream and /or downstream at any lake level [b]	Any man-made barrier that does not allow fish passage through the lake or upstream and/or downstream at any lake level [b]
Habitat Elements	Non-Native Species (in water-plants and animals)	Diverse plant community dominated by native species/no non-native predation pressure [c]	Co dominance (50%) of non-native and native species/some non-native predation pressure [c]	Non-native plants >80%, moderate non-native predation pressure [c]
	Shoreline Upwelling	No reduction of shorezone upwelling [c]	Any reduction of shorezone upwelling [c]	Elimination of shorezone upwelling [c]
	Overhanging Vegetation	Abundant overhanging, submergent, and emergent vegetation [d]	Scarce overhanging, submergent, or emergent vegetation [d]	Absent overhanging, submergent, or emergent vegetation [d]
	Substrate Composition	No change from natural state, no contaminated sediments [e]	Altered from natural substrate, no contaminated sediments [e]	Significantly altered substrate and/or contaminated sediments [e]
	Large Woody Debris	> 895 pieces/mile [d, e]	Currently meets standards for properly functioning, but lacks potential sources from riparian areas of woody debris recruitment to maintain that standard does not met standards for properly functioning and lacks potential large woody debris recruitment [d, e]	Does not met standards for properly functioning and lacks potential large woody debris recruitment [d, e]

Table 7-1 (continued). Shoreline criteria matrix.

Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning
Shoreline Conditions	Shoreline vegetation, riparian structure, and total impervious area (TIA)	1 site potential tree height of mixed native trees and shrubs (200 feet), no lawns, if site appropriate – emergent vegetation [b, c, f]	Any reduction from 1 site potential tree height of mixed native trees and shrubs, 0-4% TIA, lawns within 120 feet of lake [b, c, f]	<20 feet mixed native trees and shrubs, >4% TIA, lawns to shoreline [b, c, f]
	Shoreline profile	Natural beach elevation and substrate, no artificial armoring [c, g]	Any bulkhead or structure that disrupts maintenance of a natural beach [c, g]	Any bulkhead at or within the OHW line [c, g]
	Shoreline ambient light	No over-water structures present in the littoral zone [e, f]	One over-water structure every 300 feet	Continue occurrence of over-water structures along the shoreline [e, f]

Source: Adapted from the Lake Matrix of Pathways and Indicators for Lake Washington, Lake Sammamish, and the Ship Canal, including Lake Union (NOAA Fisheries Draft 3/11/03).

[a] Washington State Water Quality Standards.

[b] NMFW. 1996. Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale. National Marine Fisheries Service, Environmental and Technical Services Division, Habitat Conservation Branch, Lacey, Washington.

[c] NOAA Fisheries. 2003. Lake Matrix of Pathways and Indicators for Lake Washington, Lake Sammamish, and the Ship Canal, including Lake Union (Draft 3/11/03)

[d] Bowers, George. 1898. Bulletin of the United States Fish Commission for 1897. Washington: Government Printing Office.

[e] Christensen, David L., Brian R. Herwig, Daniel E. Schindler, and Stephen R. Carpenter. 1996. Impacts of lakeshore residential development on coarse woody debris in north temperate lakes. Ecological Applications 6(4):1143–1149.

[f] May ,C.W., E.B. Welch, R.R. Horner, J.R. Karr, and B.W. Mar. 1997. Quality indices for urbanization effects in Puget Sound lowland streams. Washington Department of Ecology, Seattle, Washington. p229.

[g] Herrera. 2005. Marine Shoreline Sediment Survey and Assessment. Thurston County, Washington. Prepared for Thurston Regional Planning Council by Herrera Environmental Consultants, Inc., Seattle, Washington. February 2005.

[h] Tabor, R. and Richard M. Piaskowski. 2002. Nearshore Habitat Use By Juvenile Chinook Salmon In Lentic Systems Of The Lake Washington Basin, Annual Report, 2001.

[i] Piaskowski, R. and Roger A. Tabor. 2001 Nocturnal Habitat Use By Juvenile Chinook Salmon In Nearshore Areas Of Southern Lake Washington, A Preliminary Investigation, 2000.

In the long term it is likely that summer water temperatures will increase above the lethal threshold for salmonid fish (73.4^{o} Fahrenheit [23^{o} Celsius]; Brett [1952]) partially due to further encroachment within the riparian corridor of stream tributaries, which is allowed under current ordinances (LUC 20.25H.070.A2), and partially due to global warming. The overall thermal condition of these lakes is likely regulated by air temperature and the water temperature of stream tributaries. Streams and surface water runoff into these lakes can create localized temperature gradients. Therefore, deforestation of riparian areas associated with stream tributaries to Lake Washington and Lake Sammamish likely adversely affects water temperature in these lakes.

Regulatory Alternative: In the near term, the Regulatory Alternative will have little effect on water temperatures and therefore, this indicator will continue to tend toward not properly functioning conditions. Therefore, the Regulatory Alternative will degrade existing shoreline habitat conditions in the near term.

In the long term, the effect of the Regulatory Alternative on the temperature indicator is unknown. Stream temperature is the result of complex interactions between geomorphology, soil, hydrology, vegetation, and climate within a watershed (IMST 2000). Because many variables influence stream temperature, it is uncertain if any measurable changes in stream temperature would result from regulations that protect existing vegetation (short grass lawns in many reaches) within the riparian corridors. Furthermore, the Regulatory Alternative does not require full restoration of the shoreline riparian areas (i.e., creation of a riparian area composed of multiple vegetation strata) and the predominant existing vegetation (short grass) does not provide adequate water quality functions to treat non-point source stormwater runoff that enters the lakes.

Long term monitoring of the lake water temperature will be required to assess whether the implementation of the Regulatory Alternative helps to moderate this indicator. Additional regulations may be needed to move this indicator toward properly functioning conditions if monitoring data show a continued increase in lake water temperature.

City Programs Alternative: The City Programs Alternative will tend toward not properly functioning and therefore will degrade existing habitat conditions in the near term. However, in the long term the City Programs Alternative may help to moderate lake summer water temperatures by improving stream riparian conditions thus moving the indicator toward properly functioning conditions. The City Programs Alternative may improve summer water temperatures by restoring riparian areas that provide shade to protect stream surfaces from direct solar radiation. It may also improve water temperatures by restoring wetlands and existing detention ponds thus promoting greater stormwater infiltration and groundwater recharge. Unlike the Regulatory Alternative, which would only preserve existing vegetation (grassy lawns in many reaches), the City Programs Alternative would restore vegetation that provides cover for streams. Additionally, the monitoring program on buffer performance would provide data that could be used in future city actions to restore riparian buffers, providing information such as the degree of water temperature reduction achieved as a function of buffer width and structure.

BAS Based Alternative: To improve shoreline riparian functions such as water temperature moderation based on BAS, it is recommended to establish riparian areas (i.e., planting multi-strata vegetation) along the lake shorelines and implement riparian structure setbacks. Based on BAS, a shoreline buffer ranging from 50 to 100 feet wide may be adequate to provide for the ecological functions of Bellevue's lake shorelines.

An additional structure 25-foot-wide setback to protect the shoreline buffer area is required to maintain and protect shoreline functions occurring in the buffer. The structure setback to protect the shoreline buffer is needed in order to prevent disturbance of the riparian functions that are integral to the shorelines of Lake Washington, Lake Sammamish, and Phantom Lake.

Both the Regulatory and the City Programs alternatives contain elements that are consistent with BAS. For example, through the acquisition program, the city could acquire shoreline buffer areas for restoration and preservation. In addition, implementation of the rehabilitation/monitoring program will restore areas to optimum conditions by restoring native vegetation and providing on-going maintenance to remove invasive plant species through stewardship programs.

Consequently, under the BAS Based Alternative the temperature indicator tends toward not properly functioning conditions in the near term. In the long term, the BAS Based Alternative moves the temperature indicator toward properly functioning conditions by establishing multi-strata vegetation layers were only grassy lawns exist and improving and protecting existing shoreline areas. Therefore, the BAS Based Alternative will result in degraded habitat conditions in the near term, but will improve conditions in the long term.

7.1.2 PH

The pH indicator is functioning at risk and existing water quality data indicate a degrading trend. Alkalinity levels in the Lake Washington increased from an annual mean of 28.6 mg of calcium carbonate/L in 1963 to over 40 mg calcium carbonate/L by 1990. It is thought that the long-term change in alkalinity in Lake Washington has been caused, at least in part, by urbanization that has altered the chemistry of runoff from the land to the streams. In addition, pH spikes as high as 9.4 have been observed recently in nearshore areas at night during late spring and summer (Kerwin 2001).

No Action Alternative: Under the No Action Alternative, the pH indicator will continue the current degrading trend, thus tending toward not properly functioning conditions both in the near and long term. Therefore, the No Action Alternative will degrade existing shoreline habitat conditions.

Regulatory Alternative: The Regulatory Alternative includes increasing the setbacks and buffers and setting limits for impervious surfaces. The pH indicator will not improve due to the implementation of the Regulatory Alternative. It will tend toward not properly functioning conditions both in the near and the long term. The current and proposed regulations will not restore riparian functions that could help to moderate the pH of streams and lakes. Therefore, the

Regulatory Alternative will degrade existing shoreline habitat conditions both in the near and the long term.

City Programs Alternative: Under the City Programs Alternative, pH will tend toward not properly functioning and therefore will degrade existing habitat conditions in the near term. In the long term, the City Programs Alternative may improve water pH by restoring riparian areas in stream tributaries and restoring wetlands that promote stormwater infiltration and increase groundwater/hyporheic discharge to streams. Increased groundwater/hyporheic flows may help to moderate water pH. Likewise, restored riparian functions may help to moderate the chemistry of runoff to the streams. In addition, the planned utilities maintenance programs are likely to help to improve existing water quality conditions in the stream tributaries and lakes. However, because many variables influence water pH, it is uncertain to what degree the implementation of the City Programs Alternative would influence lake water pH. Furthermore, the City Programs Alternative does not include restoration of the shoreline riparian areas (i.e., creation of a riparian area composed of multiple vegetation strata) and the predominant existing vegetation (short grass) does not provide adequate water quality functions to treat non-point source stormwater runoff that enters the lakes.

Consequently, the long-term effect of the City Programs Alternative on the pH indicator is unknown. Long-term monitoring of the lake water pH would be required to assess whether the implementation of the City Programs Alternative helps to improve this indicator. Additional actions may be needed to move this indicator toward properly functioning conditions if monitoring data shows a continued increase in lake water alkalinity.

BAS Based Alternative: Under the BAS Based Alternative, the pH indicator will tend toward not properly functioning in the near term and therefore will degrade existing habitat conditions. In the long term, the effect of the BAS Based Alternative is known.

Long-term monitoring of the lake water pH will be required after the BAS Based Alternative is implemented to assess whether this alternative helps to improve the pH indicator.

7.1.3 Chemical Contaminants

The chemical contaminants indicator is functioning at risk. Under existing conditions, Lake Washington and Lake Sammamish receive numerous non-point source pollutants from stormwater runoff (King County 2002b). As a result of the urban nature of the lakeshores, the streams that drain into them, and the point and non-point contaminant sources within the watershed, both Lake Washington and Lake Sammamish likely receive a significant contaminant load. In addition, the use of treated lumber (e.g., creosote, chromated copper arsenate) and localized increases in internal combustion powered watercraft (hydrocarbon spillage and exhaust) have been identified as pollutant sources (Kerwin 2001).

In Lake Sammamish, there is a concern that contaminants (e.g., pesticides, metals) are being discharged into the lake from non-point sources (e.g., non-point runoff, stormwater). Key non-

point source of pollutants include drainage from road surfaces and the city's drainage network. To further aggravate these problems, the lack of a riparian zone along the lake shoreline precludes most water quality functions that otherwise could help eliminate some of the chemical contaminants. For example, the lake is surrounded primarily by suburban homes with large landscaped yards. As such, the opportunity for commonly used pesticides to enter the lake is significant (Kerwin 2001).

No Action Alternative: Under the No Action Alternative, the chemical contamination indicator will tend toward not properly functioning and therefore will degrade existing habitat conditions in the near and long term. Existing city code under LUC 20.25H.70 does not set impervious surface limits for land use; therefore total impervious area (TIA) would likely increase within the lake basins. Although existing regulatory codes provide guidelines for stormwater runoff, these guidelines have not yielded properly functioning conditions for chemical contaminants. Additional allowed development and increased TIA will likely increase non-point source pollution resulting in an increasing concentration of chemical pollutants within the city's surface waters further degrading this indicator.

Regulatory Alternative: In the near term, the chemical contaminant indicator will degrade as a result of the implementation of the Regulatory Alternative, thus continuing to tend toward not properly functioning conditions. In the long term, the risk of implementing the Regulatory Alternative is unknown. Nonetheless, conditions will be expected to improve rather than degrade due to the implementation of the Regulatory Alternative. It is uncertain whether, natural regrowth of vegetation within critical areas will improve the chemical contaminants indicator in stream tributaries and lakes.

Monitoring chemical contaminants will be required to assess whether the implementation of the Regulatory Alternative helps to improve this indicator. Additional regulations may be needed to move this indicator toward properly functioning conditions if monitoring data show a continued increase of chemical contaminants in the lakes.

City Programs Alternative: Under the City Programs Alternative, the chemical contaminants indicator will tend toward not properly functioning and therefore will degrade habitat conditions in the near and long term. This is in part due to the fact that the City Programs Alternative does not include restoration of the shoreline riparian areas and the predominant existing vegetation does not provide adequate water quality functions to eliminate or significantly minimize chemical pollutants. Programmatic actions may reduce some chemical contaminants within the watershed; however, the proposed programs are not expected to affect many chemical contaminants.

BAS Based Alternative: Under the BAS Based Alternative, the chemical contaminants indicator will tend toward not properly functioning in the near term and therefore will degrade existing habitat conditions. In the long term, the BAS Based Alternative will move the chemical contaminants indicator toward properly functioning and therefore will improve existing habitat conditions for the same reason previously discussed for the water temperature indicator.

7.1.4 Nutrients/Total Phosphorous

The nutrients/total phosphorous indicator is functioning at risk. The WRIA 8 Technical Committee identified high concentrations of phosphorous in Lake Washington and nutrients in Lake Sammamish as one of the factors responsible for salmonid populations declining in those lakes (Kerwin 2001). According to King County (2002a) there is no single source of phosphorus coming into these lakes. Instead, nutrients including phosphorus are generated by almost every land use activity in the watershed: forests, logging practices, farms, homes, gardens, construction sites, natural erosion processes, stormwater runoff, commercial developments, car washing, septic tanks, and more. Nonetheless, most of phosphorus enters the lakes via the tributary streams (Kerwin 2001).

No Action Alternative: Under the No Action Alternative, the nutrients/total phosphorous indicator will tend toward not properly functioning and therefore will degrade the habitat conditions both in the near and long term.

Regulatory Alternative: In the near and long term, the nutrients/total phosphorous indicator will tend toward not properly functioning and therefore will degrade the existing habitat conditions.

In the long-term, the Regulatory Alternative will likely eliminate some nutrients/total phosphorous within the watershed, particularly tributary streams. However, this alternative does not include full restoration of the shoreline riparian areas and the predominant existing vegetation does not provide adequate water quality functions to eliminate or significantly minimize the introduction of nutrients/total phosphorous to the lakes. Although the WRIA 8 Technical Committee has identified potential restoration projects (Kerwin 2001), the overall effects of these projects would not be expected to move this indicator toward properly functioning conditions.

City Programs Alternative: Under the City Programs Alternative, the nutrients/total phosphorous indicator will tend toward not properly functioning and therefore will degrade existing habitat conditions in the near and long term, for the same reasons provided under the Regulatory Alternative.

BAS Based Alternative: Under the BAS Based Alternative, the nutrients/total phosphorous indicator will tend toward not properly functioning in the near term and therefore will degrade existing habitat conditions. In the long term, the BAS Based Alternative will move the nutrients/total phosphorous indicator toward properly functioning and therefore will improve existing habitat conditions for the same reason previously discussed for the water temperature indicator.

7.2 Habitat Access

7.2.1 Physical Barriers

The physical barriers indicator is not properly functioning. Man-made barriers block potential natural spawning and/or rearing habitat for salmonid fish within stream tributaries to Lake

Washington and Lake Sammamish (King County 2002b). The WRIA 8 Technical Committee identified fish access and passage barriers among the factors responsible for salmonid fish population decline in Lake Sammamish (King County 2002b). The weir located at the outlet of the lake (at Marymoor Park) may impede access and migration of salmonids (Kerwin 2001). In addition, man-made barriers preclude access to Phantom Lake, including an impassable culvert under West Lake Sammamish Parkway (Bellevue 2003).

No Action Alternative: Bellevue's current regulatory code does not require the removal of fish passage barriers and some of the fish barriers affecting these lakes are located outside Bellevue's city limits. Additionally, further degradation of this indicator is not expected because projects with in-water components will require Hydraulic Project Approval from the Washington Department of Fish and Wildlife, which requires that fish passage be provided. Therefore, the No Action Alternative will maintain the current status (i.e., not properly functioning) of this indicator, both in the near and the long term.

Regulatory Alternative: Under the Regulatory Alternative, the physical barrier indicator will be maintained at its current status (i.e., not properly functioning) both in the near and the long term. The proposed amendments to the regulatory code include language requiring blockage avoidance in natural watercourses, and compliance with fish and wildlife habitat conservation policies. However, the amendments do not require the removal of existing fish passage barriers.

City Programs Alternative: Under the City Programs Alternative, the existing physical barrier conditions would be maintained in the near term. The City Programs Alternative includes capital improvement projects to improve fish passage conditions by removing existing barriers within stream tributaries to Lake Washington and Lake Sammamish, and at the outlet of Lake Sammamish. Although culvert replacement projects may open up or improve access to upstream habitat, the rate of replacement is too low to allow for improvements that improve conditions at the watershed scale in the near term. In the long term, the City Programs Alternative will improve the physical barrier conditions.

BAS Based Alternative: Under the BAS Based Alternative, the physical barrier indicator will be properly functioning and therefore will improve existing habitat conditions both in the near and the long term by removing existing fish barriers.

7.3 Habitat Element

7.3.1 Non-Native Species (In-water Plants and Animals)

The non-native species indicator is not properly functioning. The WRIA 8 Technical Committee identified altered trophic interactions (predation, competition) and invasive exotic plants among the factors responsible for salmonid population decline in Lake Washington and Lake Sammamish (King County 2002b). Many non-native fish species have been identified in Lake Washington and Lake Sammamish, some of which are known to prey on juvenile salmon. In addition, Eurasian water milfoil (*Myriophyllum spicatum*), a non-native invasive macrophyte,

has replaced native aquatic vegetation in many areas and has decreased available littoral habitat for some aquatic organisms (Kerwin 2001).

No Action Alternative: Under the No Action Alternative, the non-native species indicator will further tend toward not properly functioning and therefore will degrade habitat conditions in both the near and the long term.

Regulatory Alternative: Under the Regulatory Alternative, the non-native species indicator will tend toward not properly functioning conditions and therefore will degrade habitat both in the near and the long term. The proposed new regulations do not address removal or control of existing invasive non-native aquatic plant and fish species.

Programmatic Alternative: Under the City Programs Alternative, the non-native species indicator would continue to tend toward not properly functioning and therefore will degrade habitat conditions both in the near and the long term. The City Programs Alternative does not address removal or control of existing invasive non-native aquatic plant or fish species.

BAS Based Alternative: The effect of the BAS Based Alternative the non-native species indicator is unknown both in the near and the long term. Given the extent of invasive non-native aquatic plant and fish species in the lakes, it is very unlikely that the BAS Based Alternative could move the status of this indicator toward properly functioning conditions.

7.3.2 Shoreline Upwelling

The status of the shoreline upwelling indicator is unknown.

No Action Alternative: The No Action Alternative is not expected to affect the shoreline upwelling indicator, therefore the near and long term effects are unknown.

Regulatory Alternative: The Regulatory Alternative is not expected to affect the shoreline upwelling indicator, therefore the near and long term effects are unknown.

City Programs Alternative: The City Programs Alternative is not expected to affect the shoreline upwelling indicator, therefore the near and long term effects are unknown.

BAS Based Alternative: The status of the shoreline upwelling indicator is unknown. The city should study the existing conditions of this habitat indicator to obtain BAS information on this indicator. This study should be performed in coordination with NOAA Fisheries to ensure the incorporation of the study results in the *Lake Matrix of Pathways and Indicators for Lake Washington, Lake Sammamish, and the Ship Canal, including Lake Union* (NOAA Fisheries 2003).

7.3.3 Overhanging Vegetation

The overhanging vegetation indicator is not properly functioning. Overhanging and emergent vegetation are almost absent along Bellevue's Lake Washington and Lake Sammamish shorelines and the existing submergent vegetation is almost exclusively composed of non-native invasive species (Eurasian water milfoil). Extensive shoreline armoring and the construction of over-water structures have contributed to the elimination of natural shoreline. The hardstem bulrush and willow that once dominated the shoreline community have been replaced by developed shorelines with landscaped yards (Kahler et al. 2001). As a result, the loss of natural shoreline has changed and reduced the amount of complex shoreline features such as overhanging vegetation, submerged root systems, and emergent vegetation (Kahler 2000; Carrasquero 2001).

No Action Alternative: Under the No Action Alternative, the overhanging vegetation indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and the long term.

Regulatory Alternative: Under the Regulatory Alternative, the overhanging vegetation indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and the long term, for the same reasons discussed under the Water Quality indicators.

City Programs Alternative: Under the City Programs Alternative, the overhanging vegetation indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and long term. The City Programs Alternative will likely improve this indicator at some limited locations where city programs may include planting along the shoreline. However, this alternative does not include extensive restoration of the shoreline riparian areas and the predominant existing vegetation does not provide adequate overhanging vegetation. Although the WRIA 8 Technical Committee has identified potential restoration projects (Kerwin 2001), the overall effects of these projects would not be expected to move this indicator toward properly functioning conditions.

BAS Based Alternative: Under the BAS Based Alternative, the overhanging vegetation indicator will tend toward not properly functioning in the near term and therefore will degrade existing habitat conditions. In the long term, the BAS Based Alternative will move the overhanging vegetation indicator toward properly functioning and therefore will improve existing habitat conditions for the same reasons provided for many of the water quality indicators.

7.3.4 Substrate Composition

The substrate composition indicator is not properly functioning. Under existing conditions, sand is the dominant substrate type within Bellevue's Lake Washington shoreline (Toft 2001). Historic substrate composition data are not available, but alteration of the natural sediment in front of armored shoreline segments has been reported (Kerwin 2001). According to Toft

(2001), shallow littoral areas with natural substrate are rare in Lake Washington in comparison to armored shorelines.

Substrate composition data for Lake Sammamish are not available at this time. However, the presence of contaminated sediments has been documented both in Lake Washington and Lake Sammamish (King County 2002b). Historic practices and discharges into these lakes have contributed to the chemical contamination of bottom sediments at various locations (Kerwin 2001).

No Action Alternative: Under the No Action Alternative, the substrate composition indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and long term.

Regulatory Alternative: Under the Regulatory Alternative, the substrate composition indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and long term. Although new bulkheads would be generally prohibited under the Regulatory Alternative there will be exceptions to protect structures and repair and maintenance of existing nonconforming bulkheads would be allowed. Also, while new allowed bulkheads must be bioengineered, this requirement would only apply when feasible. Consequently, although more restricted than under the No Action Alternative, the Regulatory Alternative will continue to allow the construction of new bulkheads and the repair of existing bulkheads. In addition, the Regulatory Alternative does not require the removal of contaminated sediments.

City Programs Alternative: Under the City Programs Alternative, the substrate composition indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and long term. No program action is proposed to remove contaminated sediments. In addition, the existing extensive shoreline armoring will continue to affect sediment in front of the armoring structures.

BAS Based Alternative: Under the BAS Based Alternative the substrate composition indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and long term. This alternative is unlikely to remove contaminated sediments and the existing shoreline armoring will continue to affect sediment in front of the armoring structures.

7.3.5 Large Woody Debris

The large woody debris indicator is not properly functioning. Under existing conditions, Bellevue's shorelines do not met the standards for properly functioning (> 895 pieces/mile) and lack the potential for large woody debris recruitment. Sources of the large woody debris that was once associated with the shoreline of Lake Washington have been eliminated. The remaining area of natural shoreline in Lake Washington is in the vicinity of St. Edwards Park and represents less then 5 percent of the lake's total shoreline length (Kerwin 2001). In Lake Sammamish, the natural shoreline community has been replaced by developed shorelines with

landscaped yards. This loss of natural shoreline has almost completely eliminated large woody debris from this lake (Kahler 2000; Kerwin 2001).

No Action Alternative: Under the No Action Alternative, the large woody debris indicator will continue to tend toward not properly functioning and therefore will degrade habitat conditions both in the near and the long term.

Regulatory Alternative: In the near and long term, the current status of the large woody debris indicator will degrade under the Regulatory Alternative, and it will continue to tend toward not properly functioning conditions. The Regional General Permit (USACE undated) will require the planting of a 10-foot wide buffer along the entire length of shoreline properties that construct a new dock or maintain an existing dock. Also, the Regional General Permit (USACE undated) would require large woody debris to be retained at sites proposed for dock construction. This could improve localized lake riparian conditions and provide for long-term large woody debris recruitment. However, these measures are not expected to substantially alter this indicator in the near and long term.

City Programs Alternative: Under the City Programs Alternative, the large woody debris indicator will continue to tend toward not properly functioning conditions and therefore will degrade habitat both in the near and the long term. Although the City Programs Alternative includes planting native vegetation (including 5-year monitoring) at sites where new bulkheads and/or docks are constructed, it does not include extensive restoration of the shoreline riparian areas, which under existing conditions lack potential for large woody debris recruitment. Hence, the overall effects of the City Programs Alternative will not be expected to move this indicator toward properly functioning conditions at the whole lake scale.

BAS Based Alternative: Under the BAS Based Alternative, the large woody debris indicator will tend toward not properly functioning in the near term and therefore will degrade existing habitat conditions. In the long term, the BAS Based Alternative will move the large woody debris indicator toward properly functioning and therefore will improve existing habitat conditions for the same reason previously discussed for many of the water quality indicators.

7.4 Shoreline Conditions

7.4.1 Shoreline Vegetation, Riparian Structure, and Total Impervious Area (TIA)

Shoreline vegetation, riparian structure, and the TIA indicator is not properly functioning. Under existing conditions, Bellevue's shorelines have less than 20 feet of mixed native trees and shrubs, greater than 4 percent TIA, and lawns extending to the water.

No Action Alternative: Under the No Action Alternative, the shoreline vegetation, riparian structure, and TIA indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and long term. In addition, existing city code under LUC

20.25H.70 does not set impervious surface limits for land use therefore TIA would likely continue to increase.

Regulatory Alternative: Under the Regulatory Alternative, this indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and long term. This is because TIA would continue to increase even with the addition of the proposed amendments to LUC 20.25H, which will set impervious surface limits for all land use districts for new development and redevelopment.

City Programs Alternative: Under the City Programs Alternative, this indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and long term, as the City Programs Alternative is not expected to substantially affect TIA.

BAS Based Alternative: Under the BAS Based Alternative, the shoreline vegetation, riparian structure, and TIA indicator will tend toward not properly functioning in the near term and therefore will degrade existing habitat conditions. In the long term, the effect of the BAS Based Alternative is unknown due to uncertainties associated with the effect of this alternative on TIA.

7.4.2 Shoreline Profile

The shoreline profile indicator is not properly functioning. Of an estimated 39,187 feet of shoreline, 32,054 feet (82 percent) of Bellevue's Lake Washington shoreline was armored as of 1999, all of which appears to have been constructed below the OHWM. Likewise, of an estimated 26,190 feet of the Lake Sammamish shoreline in Bellevue, 21,206 feet (81 percent) was armored as of 1999 and 6,438 feet (30 percent) was constructed below the OHWM (Herrera 2005). This represents an important physical habitat loss in these lakes, and although the current extent of shoreline armoring is unknown, it has likely increased since 1999. In particular, there has been a loss of habitat areas associated with the shoreline profile (i.e., fringe area and the shallow water portion of the littoral zone). These shallow littoral areas are utilized by juvenile salmon (Fresh 2000; Piaskowski and Tabor 2001; Tabor and Piaskowski 2002). Because juvenile Chinook salmon may select littoral habitats according to the predation risk associated with the substrate and depth of a given location (Piaskowski and Tabor 2001), the loss of shallow water habitat caused by bulkheads has likely affected juvenile Chinook salmon survival, by eliminating their preferred habitat and migration corridor and by increasing their predation risk.

No Action Alternative: Under the No Action Alternative, the shoreline profile indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and long term.

Regulatory Alternative: Under the Regulatory Alternative, the shoreline profile indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and long term. Although the new regulations will generally prohibit the construction of new bulkheads and would require the construction of bioengineered structures, exceptions will be given to protect structures and when bioengineering may not be feasible. In addition, the new regulation will not require the removal of existing bulkheads.

City Programs Alternative: Under the City Programs Alternative, the shoreline profile indicator would tend toward not properly functioning and therefore will degrade habitat conditions in the near term. Although the City Programs Alternative includes the removal of hardened shorelines projects concomitant with beach nourishment activities to restore eroded beaches, these projects would likely be associated with redevelopment activities. The expected rate of implementation for shoreline parcels is too low (0.3 percent) to have a significant benefit within five years.

In the long term, the shoreline profile indicator will tend toward properly functioning and therefore will improve habitat conditions. The program actions will include the implementation of pilot projects in order to obtain data on the technical feasibility and effectiveness (from the habitat rehabilitation viewpoint) of alternative shoreline protection measures. If the data indicate that the pilot projects work, then the information will be made available to property owners in order to:

1. Implement use of prototype armoring structures (i.e., "prototype bulkheads") when needing to retrofit existing structures, or

2. Convert existing structures, in which case the program will provide a financial incentive for a predetermined number of years.

Where bulkheads are removed, shoreline erosion prevention will be addressed through marsh creation (bioengineering vegetation measures), which will help to regain a natural shoreline profile. Structural bioengineering techniques will be tested as alternatives for stabilizing and restoring shorelines. This includes the implementation of bioengineering vegetation measures and alternative engineered shoreline armoring through the use the prototype bulkheads. Concurrent beach nourishment activities will be implemented in those areas where existing bulkheads have caused beach erosion. These restoration actions will focus on evaluating potential solutions for reducing upper beach loss along armored shorelines by increasing the elevation at which bulkheads are built and roughening the structures to dissipate wave and boat wake energy and to trap sediment. The program actions will also include the implementation of lake buffer studies, land acquisition for recreational and conservation purposes, shoreline restoration projects, and proactive code enforcement.

Long-term monitoring of the lake's shoreline profile will be required to assess whether the implementation of the City Programs Alternative helps to improve this indicator. Additional city programs actions such as the implementation of an adaptive management plan may be needed to move this indicator toward properly functioning conditions if monitoring data show a continued degradation of the shoreline profile in the lakes.

BAS Based Alternative: Under the BAS Based Alternative, the shoreline profile indicator will tend toward not properly functioning in the near term and therefore will degrade existing habitat conditions. In the long term, the BAS Based Alternative will move the shoreline profile indicator toward properly functioning and therefore will improve existing habitat conditions for the same reasons previously discussed for the shoreline profile indicator for the City Programs

Alternative, which are BAS based. In addition, under the BAS Based Alternative no additional dock and bulkhead structures will be allowed.

7.4.3 Shoreline Ambient Light

The shoreline ambient light indicator is functioning at risk. In 1942, there were an estimated 1,122 docks along the shoreline of Lake Washington. As of the year 2000, there were 2,737 piers and docks, which represent an increase of 1,615 docks from 1942 (Kerwin 2001). The majority of these structures are recreational docks constructed less than 2 meters above the water (Toft 2001). These structures collectively cover about 4 percent of the lake's surface within 100 feet of the shore, which represents an overall frequency of 36 docks per mile. Boats moored to these piers and docks shade an additional area not considered in this calculation (Kerwin 2001).

The number of docks along Bellevue's Lake Washington shoreline almost doubled from 1960 to 2000 (Toft 2001). Within Bellevue's city limits, along both Lake Washington and Lake Sammamish shorelines, residential docks are typically located between 30 feet to 100 feet apart.

No Action Alternative: Under the No Action Alternative, the shoreline ambient light indicator will continue to tend toward not properly functioning and therefore will degrade habitat conditions both in the near and long term.

Regulatory Alternative: Under the Regulatory Alternative, the shoreline ambient light indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and long term. Although the new regulations would require new residential and commercial docks to follow the standards in the Regional General Permit (USACE undated), which typically minimize the permitted structure size, there will continue to be an incremental increase in dock structures and over-water coverage.

City Programs Alternative: Under the City Programs Alternative, the shoreline ambient light indicator will tend toward not properly functioning and therefore will degrade habitat conditions both in the near and long term. The City Programs Alternative will include the implementation of tax break incentives for those property owners voluntarily retrofitting their dock structures to meet the design specifications set forth in the Regional General Permit (USACE undated). However, new docks will be constructed under the existing regulations thus offsetting the potential beneficial effect of the City Programs Alternative.

BAS Based Alternative: Under the BAS Based Alternative, the ambient light indicator will tend toward not properly functioning in the near term and therefore will degrade existing habitat conditions. In the long term, the BAS Based Alternative will move the ambient light indicator toward properly functioning and therefore will improve existing habitat conditions for the same reasons previously discussed for the shoreline profile indicator of the City Programs Alternative. In addition, under the BAS Based Alternative no additional dock and bulkhead structures will be allowed.

7.5 Conclusion

Under existing conditions, the ecological functions of Bellevue's shorelines are not properly functioning or functioning at risk, according to the NOAA Fisheries (2003) criteria and based best available science (Bellevue 2003; Herrera 2005). The risk analysis performed on the proposed alternatives for updating critical areas protection in Bellevue indicates that although the Regulatory Alternative, the City Programs Alternative, and the BAS Based Alternative may lessen the current trend of degradation of critical areas, none of the alternatives will change the trajectory toward properly functioning conditions for most indicators (Table 7-2). Consequently, in the near and long term, the overall shoreline conditions will continue to degrade, likely contributing to further imperiling the remaining salmonid populations that utilize and depend upon Bellevue's shoreline. The city should consider a combination of the Regulatory and the City Programs alternatives or the BAS Based Alternative to minimize the environmental risk associated with the implementation of the proposed critical areas update.

The single most influencing action that will likely help to change the current trend of degradation, thus placing the ecological functions of Bellevue's shorelines in a trajectory toward properly functioning conditions, is the creation of a functional multi-strata riparian zone along the Lake Washington and Lake Sammamish shorelines. This action is not included in the Regulatory Alternative or City Programs Alternative.

Monitoring the effectiveness of the indicators will be needed to determine whether actions triggered by the selected alternative are improving habitat conditions.

Table 7-2. Shoreline environmental baseline and risk analysis matrix.

Pathways and Indicators		Existing Environmental Baseline Conditions			Risk Analysis Results															
					No Action Alternative				Regulatory Alternative				City Programs Alternative				BAS Based Alternative			
Pathway	Indicators	Properly Functioning	At Risk	Not Properly Functioning	PFC	NPC	N	U	PFC	NPC	N	U	PFC	NPC	N	U	PFC	NPC	N	U
Water Quality	Temperature/ Dissolved Oxygen (DO)			X		ST/LT				ST		LT	LT	ST			LT	ST		
	pH		X			ST/LT				ST/LT				ST		LT		ST		LT
	Chemical Contamination		X			ST/LT				ST		LT		ST/LT			LT	ST		
	Nutrients Total Phosphorous (TP)		X			ST/LT				ST/LT				ST/LT			LT	ST		
Habitat Access	Physical Barriers			X			ST/LT				ST/LT		LT		ST		ST/LT			
Habitat Elements	Non-Native Species (In-water Plants and Animals)			X		ST/LT				ST/LT				ST/LT						ST/LT
	Shoreline Upwelling	U	U	U				ST/LT				ST/LT				ST/LT				ST/LT
	Overhanging Vegetation			X		ST/LT				ST/LT				ST/LT			LT	ST		
	Substrate Composition			X		ST/LT				ST/LT				ST/LT				ST/LT		
	Large Woody Debris			X		ST/LT				ST/LT				ST/LT			LT	ST		
Shoreline Conditions	Shoreline vegetation, riparian structure, and total impervious area (TIA)			X		ST/LT				ST/LT				ST/LT				ST		LT
	Shoreline profile			X		ST/LT				ST/LT			LT	ST			LT	ST		
	Shoreline ambient light		X			ST/LT				ST/LT				ST/LT			LT	ST		

Source: Adapted from the Lake Matrix of Pathways and Indicators for Lake Washington, Lake Sammamish, and the Ship Canal, including Lake Union (NOAA Fisheries Draft 3/11/03).
Notes:
ST: Short-term. LT: Long-term. PFC: Tends toward properly functioning condition.
NPC: Tends toward not properly functioning condition. N: Neutral. U: Unknown.
X: Existing condition.

8.0 Environmental Conditions and Risk Analysis for Wildlife Habitat Conservation Areas

This chapter provides a discussion of Bellevue's existing wildlife habitat conditions and an analysis of the expected environmental risk associated with the implementation of the proposed critical areas update alternatives. The risk analysis is based on best available science and includes an assessment of existing environmental conditions, and a comparison of the expected effects of a No Action, a Regulatory, a City Programs Alternative, and a BAS Based Alternative on wildlife habitat conditions in the city. The risk analysis includes a discussion of the near term (5 years) and long term (50 years) environmental effects of each of the three alternatives. The criteria used for this risk analysis were adapted for wildlife habitat from the methods used in *Making Endangered Species Act Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFW 1996). Existing environmental conditions are characterized in the Wildlife Habitat Conservation Areas Risk Criteria matrix (Table 8-1).

There are important wildlife habitat core areas and linkages primarily located in the Kelsey Creek-Mercer Slough basin, including the Mercer Slough and Kelsey Creek riparian-wetland complexes and the Richards Creek-Sunset Creek, Goff Creek, and Valley Creek riparian areas. Smaller blocks of westside lowland forest are scattered throughout the city and are not well linked to larger habitat areas. Some forested slopes remain, though most are separated from riparian areas by major arterial roads, which constitute barriers to non-avian wildlife movement. The landscape matrix in the city is medium-density urban, with some forested cover, high-density urban (commercial district), and lower density single family residential.

The city has protected and manages, through park master planning and site-specific natural resource plans, the Kelsey Creek Community Park and the Lake Hills Greenbelt Park for public recreation. These parks, though linked by Kelsey Creek, are not well connected with vegetated habitat on private lands due to numerous roads, urban development, and a narrow vegetated riparian area. This condition is typical throughout the city. The parks consist of a mosaic of lowland forest, riparian-wetland, herbaceous wetland (including farmed wetland pastures), open water, and agriculture (blueberry fields and grazed pastures). This mix of structurally diverse habitats provides potential breeding and foraging opportunities for many wildlife species, especially generalist species adapted to agricultural and urban environments.

Riparian, wetland, and other habitat areas in the city are surrounded by urban development. Many of the riparian systems, including Kelsey Creek and its tributaries, have disturbed and altered stream channels that are negatively affected by a lack of large woody debris and native vegetation cover, altered stream hydrology, and water quality problems.

8.1 Road Density

Roads create a disturbance zone in which the value of habitat for wildlife is meaningfully reduced by human and vehicle activity. A meaningful reduction in value occurs whenever an

Table 8-1. Wildlife habitat conservation areas risk criteria.

Pathway	Indicator	Indicator Definition	Properly Functioning	Not Properly Functioning
Habitat Availability	Road Density	Miles of road/mi² [a]	Equal or lesser Road Density	Increased Road Density
	Area of Habitat	Acres of forested, riparian, wetland, open water, agriculture and pasture lands.	Equal or greater Area of Habitat	Decreased Area of Habitat
	Average Core Area [c]	Average Area of Cores	Equal or greater Average Core Area	Decreased Average Core Area
	Ratio of Core Area to Core Edge Length [a,b]	Total Area of Cores/Total Linear Distance Of Edge Around Cores [b]	Equal or greater Ratio of Core Area to Core Edge Length	Decreased Ratio of Core Area to Core Edge Length
	Landscape Connectivity [a,b]	Number of links (L)/ Number of possible links (L_{max}) = L/3(V-2) where V is the number of cores. [b]	Equal or greater Landscape Connectivity	Decreased Landscape Connectivity
	Priority Habitat Area	Acres of Priority Habitats	Equal or greater Acres of Priority Habitats	Decreased Acres of Priority Habitats
	Coverage of Non-native Species	Percent cover of non-native species in habitat areas	< 15% Coverage of non-native species in habitat areas. [a]	> 15% Coverage of non-native species in habitat areas. [a]

[a] Duerksen, C.J., .N.T. Hobbs, D.L. Elliott, E. Johnson, and J.R. Miller. 2005. Managing Development for People And Wildlife, A Handbook for Habitat Protection by Local Governments. Clarion Associates of Colorado, LLC and Colorado Division of Wildlife for the Great Outdoors Colorado Trust Fund. January 2005.
[b] Forman, R.T. and M. Godron. 1986. Landscape Ecology. John Wiley and Sons, Inc., New York, New York.
[c] Cores include: Wetlands, Buffers, Native Growth Protection Areas (NGPA), Retained Vegetation Areas (RVA) and other city-owned property that is undeveloped.

area is avoided by native wildlife or when the ability of individual animals to survive and/or reproduce declines in the area.

Road kills of animals by vehicles are the most obvious impact on wildlife from road crossings in the landscape. Lalo (1987) estimated that 1,000,000 vertebrates per day are killed on roads in the United States. Populations of most small vertebrates tend to recovery rather rapidly from such losses, but the impact on populations of larger animals or rare species may be substantial. Roads also serve as barriers to dispersal for a variety of animals that are reluctant to cross them.

The road density indicator is not properly functioning within the city of Bellevue. The city's watersheds are largely developed (Bellevue 2003). A properly functioning landscape for supporting wildlife habitat would have road densities less than 2 miles per square mile area. Road densities are in excess of 3 miles per square mile within the Kelsey Creek basin.

No Action Alternative: The No Action Alternative would maintain the current degree of road density in the near and long term. The watershed is considered to be largely built-out therefore future development will be predominantly redeveloping existing properties and not result in increases in the number of roads (Kerwin 2001). The No Action Alternative will continue to degrade existing conditions in the near and long term.

Regulatory Alternative: The Regulatory Alternative affecting the road density indicator, includes increasing setbacks and setting impervious surface limits. Incentives will be provided to developers to preserve habitat linkages. Wildlife habitat overlays will be required to identify and protect mature and valuable habitat types.

The Regulatory Alternative would maintain the not properly functioning status of the road density indicator in the near term and will likely improve it in the long term as newer projects and redevelopment are regulated under the revised regulations. The Regulatory Alternative will maintain degraded conditions in the near term and improve them in the long term.

City Programs Alternative: The City Programs Alternative would not have a significant effect on road density and therefore would maintain the not properly functioning status of the road density indicator in the near and long term. As previously stated, much of the city of Bellevue is considered at close to built-out conditions and none of the proposed city programs would reverse existing trends. The City Programs Alternative will further degrade road density conditions in the near and long term.

BAS Based Alternative: The city's proposed Regulatory and City Programs alternatives are consistent with BAS recommendations for the protection of wildlife habitat conservation areas. Measures to improve conditions related to road density are somewhat limited due to the build-out conditions within most of the city. The BAS Based Alternative would utilize both the Regulatory and City Programs strategies to improve the not properly functioning status towards properly functioning in the long term. In the near term, the BAS Based Alternative would maintain existing road density conditions but would improve them in the long term as redevelopment occurs.

8.2 Area of Habitat

To maintain the quality of habitat and thereby enable native species to continue to persist, habitat alterations associated with development should be minimized. Urban areas that have been designed with little regard for wildlife generally reflect this lack of planning in the assemblages of animals that live there. These faunas typically consist of species that are omnipresent in human-dominated environments and often become pests, including for example, non-native birds such as the house sparrow, European starling, and rock dove. With some planning and attention to landscaping, the presence of more desirable species can be maintained or increased.

The area of habitat indicator is not properly functioning. The availability of native undisturbed habitat within the city of Bellevue has continued to decrease over time.

No Action Alternative: The No Action Alternative would maintain the not properly functioning status of the habitat area indicator in the near and long term as no changes in land development practices would occur. The No Action Alternative will continue to degrade the availability of habitat in the near and long term.

Regulatory Alternative: The Regulatory Alternative affecting wildlife habitat areas will rely on regulated critical areas such as riparian corridors, shorelines, wetlands, frequently flooded areas, geologic hazards, buffers and setbacks) to support habitat functions. New regulations will require a wildlife habitat overlay and habitat protection measures will be implemented to protect valued and mature habitat types. Incentives will be provided aimed at preserving habitat linkages. If special status species are present, a habitat management plan must be submitted that will ensure long term protection of the area.

The Regulatory Alternative would maintain the not properly functioning status of the habitat area indicator in the near and improve it in the long term as redevelopment occurs. The Regulatory Alternative will maintain existing degraded conditions in the near term and improve them in the long term.

City Programs Alternative: The City Programs Alternative would include acquiring lands and restoring habitat as needed to increase the area of protected wildlife habitat, increasing current levels of effort for stewardship, education, and outreach programs that would involve schools, neighborhoods, and businesses in the protection and restoration of habitats. The City Programs Alternative would also authorize completion of a landscape analysis that identified habitats and connecting links in order to better target important lands and protection measures. The City Programs Alternative would tend to maintain the not properly functioning condition of habitat area in the near term but would move the city towards a properly functioning status of the habitat area indicator in the long term based on the implementation of acquisition, stewardship, and educational programs designed to protect and restore wildlife habitat. The City Programs Alternative will maintain existing degraded conditions in the near term and improve them in the long term.

BAS Based Alternative: The city's proposed Regulatory and City Programs alternatives are consistent with BAS recommendations for the protection of wildlife habitat conservation areas. Recommended measures to improve conditions related to habitat area would utilize both the Regulatory and City Programs strategies to improve the not properly functioning status of habitat towards properly functioning in the long term. In the near term, the BAS Based Alternative would maintain existing habitat area conditions but would improve them in the long term as redevelopment occurs.

8.3 Average Core Area

The value of protecting large, intact patches of habitat is supported by many studies documenting that the area of a habitat patch exerts a strong influence on wildlife population size. Population size, in turn, influences the persistence of populations such that populations with large habitat patches tend to persist longer than those populations restricted to small ones. Core-area effects are those that result from differential use or reproductive success associated with core habitat areas of different sizes.

The average core area indicator is not properly functioning. Portions of remaining core areas of native vegetation continue to be disturbed and/or developed.

No Action Alternative: The No Action Alternative would maintain the not properly functioning status of the average core area indicator in the near and long term as no changes in land development practices would occur. The No Action Alternative will continue to degrade the size of the average core area in the near and long term.

Regulatory Alternative: The Regulatory Alternative affecting core area will rely on regulated critical areas such as riparian corridors, shorelines, wetlands, frequently flooded areas, geologic hazards, buffers and setbacks) to provide core habitat areas. New regulations will require a wildlife habitat overlay and habitat protection measures will be implemented to protect valued and mature habitat types. Incentives will be provided, aimed at preserving habitat linkages. If special status species are present, a habitat management plan must be submitted that will specify measures for long term protection of the habitat.

The Regulatory Alternative would maintain the not properly functioning status of the average core area indicator in the near term but would improve it in the long term as redevelopment occurs. The Regulatory Alternative will maintain existing degraded conditions in the near term and improve them in the long term as redevelopment occurs.

City Programs Alternative: The City Programs Alternative would include acquiring lands and restoring habitat as needed to increase the size of core areas of protected wildlife habitat, increasing current levels of effort for stewardship, education, and outreach programs that would involve schools, neighborhoods, and businesses in the protection and restoration of habitats. The City Programs Alternative would also authorize completion of a landscape analysis that

identified important habitats and connecting links in order to better target important lands and protection measures.

The City Programs Alternative will maintain existing not properly functioning conditions in the near term but would tend to move the city towards a properly functioning condition of the average core area indicator in the long term based on the implementation of an acquisition program designed to increase the number and size of core habitat areas. Educational and stewardship programs will also contribute to the long term improvement in the number and size of core habitats within the city. The City Programs Alternative will maintain existing conditions in the near term and improve them in the long term.

BAS Based Alternative: The city's proposed Regulatory and City Programs alternatives are consistent with BAS recommendations for improving protection of core wildlife habitat conservation areas. Recommended measures to improve conditions related to average core area would utilize both the Regulatory and City Programs strategies to improve the not properly functioning status towards properly functioning in the long term. In the near term, the BAS Based Alternative would maintain existing degraded average core area conditions but would improve them in the long term as redevelopment occurs.

8.4 Ratio of Core Area to Core Edge Length

Habitat fragmentation involves the division of large, contiguous areas of habitat into smaller patches isolated from one another. One of the three types of fragmentation effects on wildlife habitat is associated with edge effects (e.g., Faaborg et al. 1993). Different species are known to prefer the edge of a habitat core (usually generalist species) and others the interior of a core (e.g., Faaborg et al. 1993; Winter and Faaborg 1999). Edge effects can affect the occurrence, density, and reproductive success of animals that prefer or require the interior habitat of a core area. Minimizing edge effects can improve habitat suitability for rarer species.

The ratio of core area to core edge length indicator is not properly functioning. There continues to be an increase in edge habitat at the expense of core area habitat.

No Action Alternative: The No Action Alternative would maintain the not properly functioning status of the ratio of core area to core edge length indicator in the near and long term as no changes in land development practices would occur. The No Action Alternative will continue to degrade the ratio of core area to core length in the near and long term.

Regulatory Alternative: The Regulatory Alternative affecting the ratio of core area to core length will rely on regulated critical areas to decrease the edge length of core habitat areas. New regulations will require a wildlife habitat overlay and habitat protection measures will be implemented to protect valued and mature habitat types. Incentives will be provided, aimed at preserving habitat linkages. If special status species are present, a habitat management plan must be submitted that will specify measures for long term protection of the habitat.

The Regulatory Alternative would maintain the not properly functioning status of the ratio of core area to core length indicator in the near term and improve it in the long term as redevelopment occurs. The Regulatory Alternative will maintain existing degraded conditions in the near term and improve them in the long term.

City Programs Alternative: The City Programs Alternative would include acquiring lands and restoring habitat as needed to increase the ratio of core area to core length of protected wildlife habitat. The City Programs Alternative would also authorize completion of a landscape analysis that would identify important habitat cores that could be expanded in order to improve the ratio of core area to core length.

The City Programs Alternative will maintain existing not properly functioning conditions in the near term but would tend to move the city towards a properly functioning condition of the ratio of core area to core length indicator in the long term based on the implementation of an acquisition program designed to increase the size of core habitat areas and decrease the edge length. Educational and stewardship programs will also contribute to the long term improvement in the ratio of core area to core length within the city. The City Programs Alternative will maintain existing degraded conditions in the near term and improve them in the long term.

BAS Based Alternative: The city's proposed Regulatory and City Programs alternatives are consistent with BAS recommendations for improving the ratio of core area to core length in wildlife habitat conservation areas. Recommended measures to improve conditions related to the ratio of core area to core length would utilize both the Regulatory and City Programs strategies to improve the not properly functioning status of this indicator towards properly functioning in the long term. In the near term, the BAS Based Alternative would maintain existing degraded conditions for the ratio of core area to core length but would improve them in the long term as redevelopment occurs.

8.5 Landscape Connectivity

Habitat fragmentation results in a reduction in the area of a habitat core that can decrease its suitability for animals to a disproportionately greater degree than the actual reduction in area. Isolation from similar habitats can influence use of a particular habitat core because of reduced dispersal opportunities and can affect the occurrence, density, or reproductive success of animals in a habitat patch. Such effects can be mitigated in part by increasing landscape connectivity.

Connectivity in the native landscape is important because connected areas of native vegetation facilitate movement among species populations. Such movement is valuable for three reasons. First, many species must move among seasonal ranges in order to meet their requirements for food and cover at different times of the year. Eliminating movement routes for these migratory species can prevent them from meeting their seasonal needs for feeding and/or reproduction. Populations that are connected to each other by the process of dispersal are more likely to persist than isolated populations. Successful dispersal among populations enhances persistence because

a large population can rescue a small one from extinction by providing a source of immigrants. Third, successful dispersal among populations prevents inbreeding and helps to maintain genetic variability within populations. Such variability is associated with enhanced vigor, survival, and reproduction.

The landscape connectivity indicator is not properly functioning. Portions of remaining core areas of native vegetation continue to be fragmented through development practices.

No Action Alternative: The No Action Alternative would maintain the not properly functioning status of the landscape connectivity indicator in the near and long term as no changes in land development practices would occur. The No Action Alternative will continue to degrade landscape connectivity in the near and long term.

Regulatory Alternative: The Regulatory Alternative will require a wildlife habitat overlay and habitat protection measures will be implemented to protect valued and mature habitat types. Incentives will be provided, aimed at preserving habitat linkages. If special status species are present, a habitat management plan must be submitted that will specify measures for long term protection of the habitat.

The Regulatory Alternative would maintain the not properly functioning status of the landscape connectivity indicator in the near term and improve it in the long term as redevelopment occurs. The Regulatory Alternative will maintain existing degraded conditions in the near term and improve them in the long term.

City Programs Alternative: The City Programs Alternative would include acquiring lands and restoring habitat as needed to increase landscape connectivity between protected wildlife habitats and increasing current levels of effort for stewardship, education, and outreach programs that would involve schools, neighborhoods, and businesses in the protection and restoration of habitats. The City Programs Alternative would also authorize completion of a landscape analysis that would identify important habitat areas that could be connected by native habitat within the city's landscape.

The City Programs Alternative will maintain existing not properly functioning conditions in the near term but would tend to move the city towards a properly functioning condition of the landscape connectivity indicator in the long term based on the implementation of an acquisition program designed to acquire lands connecting valuable wildlife resources. The City Programs Alternative will maintain existing degraded conditions in the near term and improve them in the long term.

BAS Based Alternative: The city's proposed Regulatory and City Programs alternatives are consistent with BAS recommendations for improving landscape connectivity between wildlife habitat conservation areas. Recommended measures to improve conditions related to landscape connectivity would utilize both the Regulatory and City Programs strategies to improve the not properly functioning status of this indicator towards properly functioning in the long term. In the near term the BAS Based Alternative would maintain existing conditions for the landscape

connectivity indicator but would improve them in the long term as redevelopment and habitat acquisitions occur.

8.6 Priority Habitat Area

Priority habitat areas are areas set aside for protection of special species and are managed to promote the distribution and abundance of those species.

The priority habitat indicator is not properly functioning. There are few remaining areas of undisturbed priority habitats in the Kelsey Creek watershed.

No Action Alternative: The No Action Alternative would maintain the not properly functioning status of the priority habitat indicator in the near and long term as no changes in land development practices would occur. The No Action Alternative will continue to reduce the availability of priority habitats in the city for both the near and long term.

Regulatory Alternative: The Regulatory Alternative affecting protection of priority habitats will require a wildlife habitat overlay and habitat protection measures will be implemented to protect valued and mature habitat types. If special status species are present, a habitat management plan must be submitted that will specify measures for long term protection of the habitat.

The Regulatory Alternative would maintain the not properly functioning status of the landscape connectivity indicator in the near term and the long term as redevelopment occurs and is not expected to increase areas of priority habitat. The Regulatory Alternative will maintain existing degraded conditions in the near term and in the long term.

City Programs Alternative: The City Programs Alternative would include acquiring lands and restoring habitat as needed and could focus on acquiring and protecting priority habitats. The City Programs Alternative would also authorize completion of a landscape analysis that would identify important priority habitat areas within the city so protective measures could be applied.

The City Programs Alternative will maintain existing not properly functioning conditions in the near term but would tend to move the city towards a properly functioning condition if remaining priority habitats were protected and increased in size as acquisitions occur. The City Programs Alternative will maintain existing degraded conditions in the near term and improve them in the long term.

BAS Based Alternative: Recommended measures to improve protection for remaining priority habitats and expansion of those habitats through rehabilitation initiatives would utilize both the Regulatory and City Programs strategies to improve the not properly functioning status of this indicator towards properly functioning in the long term. In the near term the BAS Based Alternative would maintain existing degraded conditions for the protection of priority habitats, but would improve them in the long term as redevelopment and acquisitions occur.

8.7 Coverage of Non-native Species

Continued urban development decreases the amount of native wildlife habitat. In addition, human disturbances in habitat areas can increase the spread of nonnative invasive plants. These species can rapidly supplant natives, decreasing populations of wildlife adapted to live in native habitats.

The coverage of non-native species indicator is not properly functioning. The city is highly urbanized (Bellevue 2003). Invasive non-native plants already established in the city's natural areas include bamboo, Japanese knotweed, Scot's broom, reed canarygrass, and Himalayan blackberry. Non-native invasive plants are continuing to displace native habitats in the Mercer Slough and Richards Creek riparian areas.

No Action Alternative: The No Action Alternative would maintain the not properly functioning condition of the non-native species indicator in the near and long term. The No Action Alternative will continue to increase the coverage of non-native species in the city for both the near and long term.

Regulatory Alternative: The Regulatory Alternative will create an allowed use for habitat enhancement projects in buffers and setbacks. The use of supplemental planting will be revised to allow for habitat enhancement and to support critical area improvement projects, subject to performance standards.

The Regulatory Alternative would maintain the not properly functioning condition of the non-native species indicator in the near and long term. Although habitat enhancement will be allowed in setbacks and buffers, it is not required and no incentives are provided. The Regulatory Alternative will continue the expansion of non-native species coverage and will further degrade existing conditions in the near and long term.

City Programs Alternative: The City Programs Alternative includes education and stewardship programs to educate landowners and to encourage them to restore native habitat. It also includes funding for rehabilitation projects that could be used to reduce non-native species cover within important habitats. These initiatives would maintain existing conditions in the near term and tend to move the current status of the non-native species indicator towards properly functioning in the long term. The City Programs Alternative would maintain existing degraded conditions in the near term and improve them in the long term as acquisitions occurred and programs began to take more widespread effect.

BAS Based Alternative: The City Programs Alternative is in compliance with the recommendations of best available science. These initiatives would maintain existing conditions in the near term and tend to move the current status of the non-native species indicator towards properly functioning in the long term. The BAS Based Alternative would maintain existing degraded conditions in the near term and improve them in the long term as acquisitions occurred and programs began to take more widespread effect.

8.8 Conclusion

Table 8-2 summarizes the results of this analysis of risk to the structure, functions, and values of wildlife habitat conservation areas.

Table 8-2. Wildlife habitat conservation areas environmental conditions and risk analysis matrix.

Pathways and Indicators		Existing Environmental Conditions		Risk Analysis Results															
				No Action Alternative				Regulatory Alternative				City Programs Alternative				BAS Based Alternative			
Pathway	Indicator	Properly Functioning	Not Properly Functioning	PFC	NPC	N	U	PFC	NPC	N	U	PFC	NPC	N	U	PFC	NPC	N	U
Habitat Availability	Road Density		X			NT/LT		LT		NT				NT/LT		LT		NT	
	Area of Habitat		X			NT/LT		LT		NT		LT		NT		LT		NT	
	Average Core Area		X			NT/LT		LT		NT		LT		NT		LT		NT	
	Ratio of Core Area to Core Edge Length		X			NT/LT		LT		NT		LT		NT		LT		NT	
	Landscape Connectivity		X			NT/LT		LT		NT		LT		NT		LT		NT	
	Increased Acres of Priority Habitats		X			NT/LT		LT		NT		LT		NT		LT		NT	
	Coverage of Non-native Species		X			NT/LT				NT/LT		LT		NT		LT		NT	

PFC: Tends toward properly functioning condition.
NPC: Tends toward not properly functioning condition.
N: Neutral.
U: Unknown.
NT: Near-term (5 years).
LT: Long-term (50 years).

9.0 Summary and Conclusions

The four alternatives evaluated in this analysis vary in their ability to maintain and improve protection of natural resources in critical areas. With the exception of the No Action Alternative all others will maintain or improve many indicators in the long term and some in the near term.

Tables 9-1 through 9-6 compare the effects each alternative would have on existing conditions for each critical area indicator. The tables are based on the analyses conducted within each chapter to determine whether an alternative would tend towards properly functioning, at risk or not properly functioning critical area functions, or public health and safety in the near and long term. This data was translated to describe the effect an alternative will have on existing conditions in terms of whether it would degrade, maintain, or improve existing conditions. The summary assessments in Tables 8-1 through 8-6 describe the trends of each alternative on existing conditions.

The analysis of natural resource impacts in this risk analysis derives conclusions about the effects of the alternatives relative to standards from a best available science (BAS) review of literature relating to protection for and from a critical area. The results indicate the effect of the alternatives on objective measures of properly functioning ecological systems. Because Bellevue is a largely urbanized area, many ecological functions have already been impaired by development. While the action alternatives, in most cases, will at least maintain existing conditions, even the BAS Based Alternative is not always able to demonstrate it would improve existing conditions.

The risk analysis shows that neither the proposed Regulatory Alternative nor the City Programs Alternative alone would have the effect of reversing the trend toward degradation of some critical area functions. Because the proposed alternatives would not reverse most of the effects of urbanization, many ecological functions would remain at risk or not properly functioning, even though the regulations would protect from further degradation, and may even improve conditions to a degree. The determination that a particular ecological function would remain at risk or not properly functioning should not be read as meaning that the alternatives would cause an adverse impact.

For geologically hazardous areas, critical area regulations are intended to protect human welfare, including occupied structures, utilities, and roads that people depend upon, as well as to prevent damage to natural resources. For theses areas, the conclusion is that the proposed Regulatory/City Programs alternatives generally provide sufficient protection to ensure that the risk of harm to essential public facilities and other development would be minimized; in other words, that they would be "properly protected", and no adverse impacts are expected from the implementation of the new proposed regulations.

For streams, wetlands, and shorelines, particularly areas that historically have provided habitat for salmonid species, neither action alternative alone would provide adequate protection to reverse the current trends toward degradation of some ecological functions. This is due largely

Table 9-1. Comparison of the trends for geologic hazards conditions by alternative.

Geological Hazards	Near Term (5 Years)			Long Term (50 Years)		
	No Action Alternative	Regulatory Alternative/ City Programs Alternative	BAS Based Alternative	No Action Alternative	Regulatory Alternative/ City Programs Alternative	BAS Based Alternative
Ground Shaking	⊖	⊖	⊖	⊖	⊖	⊖
Surface Rupture	●	●	⊖	●	●	O
Liquefaction	⊖	⊖	⊖	⊖	⊖	⊖
Tsunami and Seiche Hazards	●	●	O	●	●	O
Erosion	●	O	O	●	O	O
Landsliding	●	O	O	●	O	O
Volcanic Eruption	⊖	⊖	⊖	⊖	⊖	⊖
Coal Mines	⊖	⊖	⊖	⊖	⊖	⊖

⊖ = Critical area functions and public health and safety would be maintained as properly protected or at risk.

O = Critical area functions and public health and safety would improve relative to current conditions.

● = Degraded conditions would result for critical area functions and public health and safety.

Table 9-2. Comparison of the trends for frequently flooded area conditions by alternative.

Frequently Flooded Areas	Near Term (5 Years)				Long Term (50 Years)			
	No Action Alternative	Regulatory Alternative/ City Programs Alternative	Delete column	BAS Based Alternative	No Action Alternative	Regulatory Alternative/ City Programs Alternative	Delete column	BAS Based Alternative
Development Standards	⊖	⊖	⊖	⊖	⊖	⊖	⊖	O
Floodway Conditions	⊖	⊖	⊖	⊖	⊖	O	⊖	O
Channel Migration	⊖	⊖	⊖	⊖	⊖	⊖	⊖	O

⊖ = Critical area functions and public health and safety would be maintained as properly protected or at risk.

O = Critical area functions and public health and safety would improve relative to current conditions.

● = Degraded conditions would result for critical area functions and public health and safety.

Table 9-3. Comparison of the trends for streams and riparian area conditions by alternative.

		Near Term (5 Years)				Long Term (50 Years)			
		No Action Alternative	Regulatory Alternative	City Programs Alternative	BAS Based Alternative	No Action Alternative	Regulatory Alternative	City Programs Alternative	BAS Based Alternative
Water Quality	Temperature	●	●	●	●	●	●	○	○
	Sediment and Turbidity	●	●	●	●	●	●	●	○
	Chemical Contaminants and Nutrients	●	●	●	●	●	●	●	○
Habitat Access	Physical Barriers	●	●	●	○	●	●	○	○
Habitat Element	Substrate	●	●	●	●	●	●	●	●
	Large Woody Debris (LWD)	●	●	○	○	●	●	○	○
	Pool Frequency	●	●	●	○	●	●	●	○
	Pool Quality	●	⊖	○	○	●	⊖	○	○
	Off-channel Habitat	⊖	⊖	⊖	⊖	⊖	⊖	○	○
	Refugia	●	⊖	⊖	⊖	●	⊖	⊖	○
Channel Condition and Dynamics	Width/Depth Ratio	●	●	⊖	⊖	●	●	⊖	⊖
	Streambank Conditions	Unknown	Unknown	⊖	⊖	Unknown	Unknown	⊖	⊖
	Floodplain Connectivity	●	⊖	⊖	⊖	●	⊖	○	○

Table 9-3 (continued). Comparison of the trends for streams and riparian area conditions by alternative.

		Near Term (5 Years)				Long Term (50 Years)			
		No Action Alternative	Regulatory Alternative	City Programs Alternative	BAS Based Alternative	No Action Alternative	Regulatory Alternative	City Programs Alternative	BAS Based Alternative
Flow and Hydrology	Change in Peak/Base Flows	●	●	⊖	⊖	●	●	O	O
	Increase in Drainage Network	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
Watershed Condition	Road Density & Location	●	●	●	●	●	●	●	●
	Disturbance History	●	●	●	●	●	O	●	O
	Riparian Reserves	●	●	●	●	●	●	●	Unknown
	Natural Disturbances	●	Unknown	Unknown	Unknown	●	Unknown	Unknown	Unknown
	Total Impervious Area	●	●	●	●	●	●	●	Unknown
	Riparian Breaks	●	⊖	●	●	●	⊖	●	Unknown

⊖ = Critical area functions and public health and safety would be maintained as properly protected or at risk.

O = Critical area functions and public health and safety would improve relative to current conditions.

● = Degraded conditions would result for critical area functions and public health and safety.

Table 9-4. Comparison of the trends for wetland conditions by alternative.

		Near Term (5 Years)				Long Term (50 Years)			
		No Action Alternative	Regulatory Alternative	City Programs Alternative	BAS Based Alternative	No Action Alternative	Regulatory Alternative	City Programs Alternative	BAS Based Alternative
Water Regime [a]	Average Water Level Fluctuation	●	●	●	●	●	○	●	○
	Watershed Impervious Area	●	●	●	●	●	○	●	○
Water Quality	Conductivity	●	●	●	○	●	●	●	○
	Total Phosphorus (TP)	●	●	○	○	●	○	○	○
	Total Suspended Solids (TS)	●	●	○	○	●	○	○	○
	Ammonia (NH3-N)	●	●	●	○	●	●	●	○
	Zinc (Zn)	●	●	○	○	●	○	○	○
Habitat	Coverage of Non-Native Species	●	●	●	●	●	○	○	○
	Wetland Area (acres)	●	●	●	●	●	●	⊖	○
	Area of Upland Habitat Adjacent to a Wetland	●	●	●	●	●	○	○	○
Physical Modifications	Acres of Wetlands Filled	●	●	●	○	●	●	○	○

[a] Note that the city plans to revise their stormwater regulations on 2006 to provide incentives for low impact development projects and to place additional limitations on allowed impervious area. These actions will benefit hydrologic indicators but they are not considered here as they are not proposed as part of the critical areas update.

⊖ = Critical area functions and public health and safety would be maintained as properly protected or at risk.

○ = Critical area functions and public health and safety would improve relative to current conditions.

● = Degraded conditions would result for critical area functions and public health and safety.

Table 9-5. Comparison of the trends for shoreline conditions by alternative.

		Near Term (5 Years)				Long Term (50 Years)			
		No Action Alternative	Regulatory Alternative	City Programs Alternative	BAS Based Alternative	No Action Alternative	Regulatory Alternative	City Programs Alternative	BAS Based Alternative
Water Quality	Temperature/ Dissolved Oxygen	●	●	●	●	●	Unknown	○	○
	PH	●	●	●	●	●	●	Unknown	Unknown
	Chemical Contaminants	●	●	●	●	●	Unknown	●	○
	Nutrients/Total Phosphorus	●	●	●	●	●	●	●	○
Habitat Access	Physical Barriers	●	●	●	○	●	●	○	○
Habitat Element	Non-Native Species (In-water Plants and Animals)	●	●	●	Unknown	●	●	●	Unknown
	Shoreline Upwelling	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
	Overhanging Vegetation	●	●	●	●	●	●	●	○
	Substrate Composition	●	●	●	●	●	●	●	●
	Large Woody Debris	●	●	●	●	●	●	●	○
Shoreline Conditions	Shoreline Vegetation, Riparian Structure, and Total Impervious Area (TIA)	●	●	●	●	●	●	●	Unknown
	Shoreline Profile	●	●	●	●	●	●	○	○
	Shoreline Ambient Light	●	●	●	●	●	●	●	○

⊖ = Critical area functions and public health and safety would be maintained as properly protected or at risk.

○ = Critical area functions and public health and safety would improve relative to current conditions.

● = Degraded conditions would result for critical area functions and public health and safety.

Table 9-6. Comparison of the trends for wildlife habitat conservation area conditions by alternative.

	Near Term (5 Years)				Long Term (50 Years)			
	No Action Alternative	Regulatory Alternative	City Programs Alternative	BAS Based Alternative	No Action Alternative	Regulatory Alternative	City Programs Alternative	BAS Based Alternative
Road Density	●	●	●	●	●	○	●	○
Area of Habitat	●	●	●	●	●	○	○	○
Average Core Area	●	●	●	●	●	○	○	○
Ratio of Core Area to Core Edge Length	●	●	●	●	●	○	○	○
Landscape Connectivity	●	●	●	●	●	○	○	○
Priority Habitat Area	●	●	●	●	●	●	○	○
Coverage of Non-native Species	●	●	●	●	●	●	○	○

⊖ = Critical area functions and public health and safety would be maintained as properly protected or at risk.

○ = Critical area functions and public health and safety would improve relative to current conditions.

● = Degraded conditions would result for critical area functions and public health and safety.

to the fact that the regulations would not reverse past impacts, and not because future development under either alternative would have adverse impacts. Both action alternatives would have an overall positive effect on streams, wetlands, and shorelines relative to what would occur under the No Action Alternative. Furthermore, although some adverse affects would still be allowed in some instances (e.g., filling of wetlands for road projects), the overall positive effect would more than offset these continued adverse impacts.

A combination of the Regulatory and the City Programs alternatives would be the most effective way to minimize the environmental risk associated with the implementation of the proposed critical areas update. In addition, stewardship programs could be designed to facilitate the gradual development of a multistrata buffer areas along the city's many valuable wetlands, streams and shorelines along Lake Washington and Lake Sammamish.

The cumulative effects of the proposed Regulatory Alternative, together with other regulatory programs such as the storm and surface water utility code, would generally be positive. Over a 50-year period, redevelopment would bring more properties into compliance with the new regulations thus reducing the risks to protected resources. The City Programs Alternative would also have benefits in the long run, in some cases even reversing previous effects of urbanization through such practices as placing woody debris in streams, acquiring wildlife habitat, and rehabilitating critical areas.

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APPENDIX A

City of Bellevue
Proposed Regulatory Amendments

CITY OF BELLEVUE, WASHINGTON
ORDINANCE NO. _____

AN ORDINANCE amending the Bellevue Land Use Code to update critical areas regulations considering best available science, local policies and Growth Management Act requirements; repealing Part 20.25H of the Bellevue Land Use Code and Resolution 5712; and creating a new Part 20.25H of the Bellevue Land Use Code; and establishing an effective date.

WHEREAS, [insert a number of whereas clauses that describe why the City is processing the amendment, based on BAS, public comment and the Comprehensive Plan]; and

WHEREAS, the Coal Mine Hazard regulations adopted in 1993 by Resolution 5712 represent the best available information and techniques for development within identified coal mine hazards areas, and should be included in the Land Use Code; and

WHEREAS, the Planning Commission held a public hearing on July 6, 2005 with regard to such proposed Land Use Code amendment; and

WHEREAS, the Planning Commission recommends that the City Council approve such proposed amendment; and

WHEREAS, the City of Bellevue has complied with the State Environmental Policy Act (SEPA), Chapter 43.21C RCW, and the City's Environmental Procedures Code, BCC 22.02; now, therefore,

THE CITY COUNCIL OF THE CITY OF BELLEVUE, WASHINGTON, DOES ORDAIN AS FOLLOWS:

Section 1. Resolution 5712 is hereby repealed.

Section 2. Part 20.25H of the Bellevue Land Use Code is hereby repealed.

Section 3. A new Part 20.25H of the Bellevue Land Use Code is hereby adopted as follows:

Critical Areas Overlay District

Part 20.25H

I. SCOPE AND PURPOSE

20.25H.005 Scope.

This Part 20.25H establishes standards and procedures that apply to development within the "Critical Areas Overlay District," which includes any site that is in whole or in part designated as a critical area or critical area buffer. All development within the Critical Areas Overlay District must be reviewed and approved pursuant to this Part in addition to being subject to all other relevant standards of the Bellevue City Code. The Critical Areas Overlay District does not apply to the Downtown.

20.25H.010 Purpose.

The Critical Areas Overlay District is a mechanism by which the City recognizes the existence of natural conditions which affect the use and development of property. Through this part, the City designates and classifies ecologically sensitive and hazard areas and imposes regulations on the use and development of affected property in order to protect the functions and values of these areas and the public health, safety and welfare, and to allow the reasonable use of private property.

20.25H.015 Applicable procedure.

The Critical Areas Overlay District consists of two parts:(A) that part of a site that is not contained within a critical area or critical area buffer, and (B) that part of a site that is within a critical area or critical area buffer.

A. If a proposal avoids all disturbance or modification of the critical area and critical area buffer, the proposal is subject to the provisions of this Part 20.25H through the review process for the underlying permit or approval required for the development, and a decision on such application may be appealed according to the appeal process applicable to the underlying permit or approval.

B. If a proposal involves disturbance to or modification of the critical area or critical area buffer, then in addition to the review process for the underlying permit or approval required for the development, the proposal shall require a critical areas land use permit, LUC Part 20.30P.

20.25H.020 Submittal Requirements.

A. The Director shall specify the submittal requirements, including type, detail and number of copies, for a use or development application to be deemed complete and accepted for filing.

B. The Director may waive specific submittal requirements determined to be unnecessary for review of an application.

II. DESIGNATION OF CRITICAL AREAS AND DIMENSIONAL STANDARDS

20.25H.025. Designation of Critical Areas.

The following areas are hereby designated as critical areas. For additional information about identifying each critical area, see the specific sections noted.

Critical Area Category or Type	Additional Information Identifying Critical Area
Stream Corridors	
Type S Water	LUC 20.25H.075
Type F Water	LUC 20.25H.075
Type N Water	LUC 20.25H.075
Type O Water	LUC 20.25H.075
Closed corridor, regardless of type; Kelsey Creek drainage basin	LUC 20.25H.075
Closed corridor, regardless of type; all other drainage basins	LUC 20.25H.075
Wetlands	
Category I	LUC 20.25H.095
Category II	LUC 20.25H.095
Category III	LUC 20.25H.095
Category IV over 2500 square feet	LUC 20.25H.095
Shorelines	
Shorelines	LUC 20.25E.017.D
Geologic Hazard Areas	
Landslide Hazards	LUC 20.25H.120
Steep Slopes	LUC 20.25H.120
Coal Mine Hazard Areas	LUC 20.25H.120
Habitat for Species of Local Concern	
Habitat for species of local concern	LUC 20.25H.150
Areas of Special Flood Hazard	
Areas of Special Flood Hazard	LUC 20.25H.175

20.25H.030 Identification of Critical Area.

A. Determining Presence of Critical Area. A determination of whether a site contains a critical area or critical area buffer shall be made as part of the review process for the proposal, based on information provided by the applicant. The director may specify the information required to determine the presence and extent of a critical area or buffer, including, but not limited to: site surveys, topographic maps, technical environmental analysis, peer reviews, or other

information the Director deems necessary. The location and extent of critical areas and buffers may be required to be surveyed and marked in the field.

B. Recording required. The property owner receiving approval of a use or development pursuant to this Part 20.25H shall record a site plan or other instrument clearly delineating the critical area and critical area buffer with the King County Division of Records and Elections. The site plans must include a statement that the provisions of this Part 20.25H as now or hereafter amended control use and development of the subject property. The Director may also require recording of the delineation of, and restrictions of, Native Growth Protection Areas or Native Growth Protection Easements designated as part of the approval. Single lot residential development in single-family residential land use districts is exempt from this recording requirement, except where explicitly required in this Part 20.25H.

20.25H.035 Critical Area Buffers and Structure Setbacks.

A. Standard Buffer. The following critical area buffers and structure setbacks are established for each critical area set forth below. For information about modifying required critical area buffers and structure setbacks, see the referenced sections noted in the table. If a designated critical area is not listed below, that critical area does not have an associated critical area buffer or structure setback.

Critical Area Category or Type	Critical Area Buffer Width	Structure Setback	Modification of Buffer or Setback
Stream Corridors			
Type S Water	100 ft	20 ft	LUC 20.25H.075
Type F Water	100 ft	20 ft	LUC 20.25H.075
Type N Water	50 ft	15 ft	LUC 20.25H.075
Type O Water	25 ft	10 ft	LUC 20.25H.075
Closed corridor, regardless of type; Kelsey Creek drainage basin	50 ft or buffer required by stream type, whichever is less	None	LUC 20.25H.075
Closed corridor, regardless of type; all other drainage basins	10 ft	None	LUC 20.25H.075
Wetlands			
Category I		20 ft	LUC 20.25H.095
Natural Heritage wetland	190 ft		
Bogs	190 ft		
Forested wetland	Based on score for habitat or water quality		
Habitat score of 29 to 36	225 ft		
Habitat score of 20 to 28	110 ft		
Water quality score of 24 to 32 and habitat score of less than 20	75 ft		
All others	75		
Category II		20 ft	LUC 20.25H.095
Habitat score of 29 to 36	225 ft		
Habitat score of 20 to 28	110 ft		

Critical Area Category or Type	Critical Area Buffer Width	Structure Setback	Modification of Buffer or Setback
Water quality score of 24 to 32 and habitat score of less than 20	75 ft		
All others	75 ft		
Category III		15 ft	LUC 20.25H.095
Habitat score of 20 to 28 points	110 ft		
All others	60 ft		
Category IV over 2500 square feet	40 ft	None	LUC 20.25H.095
Shorelines			
All shorelines	50 ft	None	LUC 20.25H.115
Geologic Hazard Areas			
Landslide Hazards	Toe-of-slope: 75 ft	None	LUC 20.25H.120
	Top-of-slope: 50 ft		
Steep Slopes	Toe-of-slope: 75 ft	None	LUC 20.25H.120
	Top-of-slope: 50 ft		
Coal Mine Hazard Areas	None	None	LUC 20.25H.120
Habitat for Species of Local Importance			
Habitat for species of local importance	Only if required for known species on site	None	LUC 20.25H.150
Areas of Special Flood Hazard			
Areas of Special Flood Hazard	None	None	N/A

B. Buffer on Sites with Existing Development. [Note: The language of this subsection is being suggested by staff, and has not been endorsed by the Planning Commission]

Where a structure legally established on a site prior to December 1, 2005 encroaches into the critical area buffer established in subsection A, the critical area buffer shall be modified to

exclude the footprint of the existing structure. Expansion of an existing structure into the critical area buffer shall be allowed only pursuant to the provisions of LUC 20.25H.060.

20.25H.040 Standards for modifying non-critical area setbacks.

A. When Applicable. Certain provisions of this Part 20.25H allow disturbance within a critical area or critical area buffer. This section applies when, pursuant to another section of this Part 20.25H, the applicant must demonstrate that non-critical area setbacks have been modified to the maximum extent allowed under this section.

B. Allowed Modifications to General Dimensional Chart. The required dimensions of 20.20.010 for non-critical area setbacks may be reduced to no less than the minimums set forth in this subsection, provided that the modification shall be the minimum necessary to allow avoidance of impacts in the critical area and critical area buffer. All other provisions of 20.20.010 shall apply, including the applicable footnotes from the general dimensional chart.

Land Use District	R-1	R-1.8	R-2.5	R-3.5 R-4 R-5 R-7.5*	R-10; R-15; R-20	R-30
Front Yard (ft) (1)	25	20	10	10	10	10
Rear Yard (ft)	20	20	20	15	20	20
Side Yard (ft)	5	5	5	5	5	5(2)
2 Side Yards (ft)	15	10	10	10	10	10

**Not effective within the jurisdiction of the East Bellevue Community Council.*

Notes:

1. Any garage or other structure shall be set back the minimum necessary to allow on-site parking on any driveway without blocking a sidewalk, for proposals without garages, there shall be sufficient area on the site to allow for required on-site parking without blocking a sidewalk.

2. A side yard setback in R-30 Districts increases to 20 feet on any side yard where the structure exceeds 30 feet above finished grade.

C. Allowed Modifications to Transition Area Requirements. The minimum structure setback established in 20.25B.040.B.1 may not be modified under this section 20.25H.040. The minimum separation between structures established in LUC 20.25B.040.B.2 shall be reduced to no less than six feet between structures when the requirements of this section apply.

20.25H.045 Development Density/Intensity.

A. General. For development in the Critical Areas Overlay District, the number of dwelling units per acre and the maximum floor area ratio for office space is determined pursuant to this section.

B. Dwelling Units per Acre. The maximum density allowed for a site in the Critical Areas Overlay District is equal to the number of dwelling units per acre as specified in LUC 20.20.010, times the buildable area in acres, plus the dwelling units per acre times the total area of critical area and critical area buffer in acres times the Development Factor derived from subsection D below:

[(DU/acre)(Buildable Area in acres) + (DU/acre)(Total critical area and critical area buffer in acres)(Development Factor)]=Maximum dwelling unit potential

C. Floor Area Ratio for Office Space.

a. The maximum allowable office floor area for a site which contains a critical area or critical area buffer is equal to 0.5 times the buildable area in square feet plus 0.5 times the total area in critical area and critical area buffer in square feet times the Development Factor derived from subsection D below:

[(0.5)(Buildable Area in sq. ft.) + (0.5)(total critical area and critical area buffer in sq. ft.)(Development Factor)]=Maximum Office Development Potential

b. A property within the Critical Areas Overlay District is exempt from the sliding scale FAR requirement of LUC 20.20.010, Note 8. The applicable maximum floor area ratio to the buildable area is 0.5 regardless of building square footage.

D. Development Factor. The development factor is a percent credit to be used in computing the number of allowed dwelling units or the maximum allowed office floor area for a site within the Critical Areas Overlay District. The development factor is determined by figuring the percentage of the total site that is buildable area, divided by 100. The result should be rounded to the nearest hundredth. The following table illustrates the Development Factor:

Total Site (as %)	Critical area and critical area buffer total (as % of total site)	Buildable Area (as % of total site)	Development Factor (% BA/100)
100	10	90	.9
100	35	65	.65
100	50	50	.5
100	75	25	.25
100	90	10	.1

III. USE AND DEVELOPMENT IN THE CRITICAL AREAS OVERLAY DISTRICT

20.25H.050 Uses in the Critical Areas Overlay District.

A. General. Except as set forth in subsection B of this section, the uses established by LUC 20.10.440 for the applicable land use district may be undertaken in the Critical Areas Overlay District as allowed for the underlying land use district. All development associated with the use shall comply with the provisions of this Part 20.25H.

B. Shorelines. Where the Critical Areas Overlay District and Shorelines Overlay District apply to the same site, the uses established by LUC 20.10.440 for the applicable land use district may be undertaken. The applicable permitting process to establish that use is set forth in 20.25E.070.

20.25H.055 Development in the Critical Areas Overlay District.

A. Coal Mine Hazard Areas and Habitat for Species of Local Importance. The coal mine hazard areas and habitat for species of local importance designated as critical areas by this Part 20.25H do not include absolute restrictions on development or activity. Instead, uses allowed under LUC 20.25H.050 may be undertaken in such critical areas, so long as the performance standards of LUC 20.25H.130 (coal mine hazard areas) or LUC 20.25H.160 (habitat for special status species) are satisfied.

B. Other Critical Areas. Except as set forth in section A above, all development, use, land alteration or other activity within the Critical Areas Overlay District shall be located outside of the critical area and the critical area buffer, unless otherwise allowed under one of the circumstances or processes described in subsection C.

B. Development Allowed within Critical Area or Critical Area Buffer. Development, land alteration or other disturbance within a critical area or critical area buffer may be allowed in compliance with the sections described below:

1. Existing allowed activities, as set forth in 20.25H.060;

2. Repair, maintenance and certain expansions of existing structures, as set forth in 20.25H.065;

3. New or expanded allowed uses or activities, as set forth in 20.25H.070;

4. Critical area buffer modifications for the following critical areas:

    a. Stream corridors, see 20.25H.075;

    b. Wetlands, see 20.25H.095;

    c. Shorelines, see 20.25H.115;

    d. Geologic Hazards, see 20.25H.120.

5. Uses and Activities in the Area of Special Flood Hazard, see 20.25H.180

6. Modifications allowed through a Critical Areas Report, see 20.25H.230;

7. Reasonable use exceptions, as allowed in 20.25H.190;

8. Variances, see Part 20.30G and 20.30H; or

9. Shoreline specific uses and activities, where allowed under LUC 20.25E.080.

20.25H.060 Existing Allowed Uses and Activities. The uses and activities described in subsection B may be undertaken in a critical area or critical area buffer if all of the requirements

of this section are met. The provisions of this section will be applied through the review process applicable to the underlying use or activity, and will not require a critical areas land use permit. This section shall not apply to the Areas of Special Flood Hazard. See LUC 20.25H.180

A. Hierarchy of Alteration. Where an activity is proposed on a site with more than one type of critical area, preference shall be given to disturbing those critical areas with the least sensitivity to human disturbance, based on a consideration of both existing functions and values, and future functions and values if left undisturbed.

B. Allowed Uses and Activities.

1. Repair and maintenance of city and public park facilities, utility facilities, utility systems, and essential public facilities;
2. Repair and maintenance of public rights of way, private roads, access easements, and driveways;
3. Repair and maintenance of bridges and culverts;
4. Repair and maintenance of private non-motorized trails;
5. Repair and maintenance of private parks; and
6. Existing agricultural and aquaculture activities.

For purposes of this section, repair and maintenance includes replacement of facilities and systems, or expansion so long as the area of permanent disturbance of the critical area or critical area buffer is not expanded. As applicable to public rights of way, private roads, access easements and driveways, repair and maintenance also includes removing and replacing improvements within the area of permanent disturbance, and expansion of paved areas, so long as the area of permanent disturbance within the critical area or critical area buffer is not expanded.

C. Performance Standards.

1. General. Any use or activity approved pursuant to this section 20.25H.060 shall comply with the following performance standards:

   a. Work shall be consistent with all applicable City of Bellevue codes and standards;
   b. Removal of significant trees is prohibited; and
   c. Areas of temporary disturbance associated with the work shall be restored to pre-project conditions, pursuant to a restoration plan meeting the requirements of LUC 20.25H.210.

2. Specific Standards. In addition to the above generally-applicable standards the following standards may also apply. In the event of a conflict between the generally-applicable performance standards and specific standards, those more protective of critical area functions and values shall prevail.

   a. Existing agricultural uses:

      i. Erosion control measures, such as crop rotation, mulching, strip cropping and contour cultivation must be used in conformance with guidelines and standards established by the Natural Resources Conservation Service, U.S. Department of Agriculture;

ii. Wetland areas must be protected from significant impacts of agricultural chemicals and pesticides as required by the Storm and Surface Water Utility Code, BCC 24.06.195, now or as hereafter amended, and must meet the water quality standards of BCC 24.06.060K, now or as hereafter amended;
iii. All activities shall be consistent with the City of Bellevue's "Environmental Best Practices Manual" now or as hereafter amended.

b. Standards applicable to uses and activities in the area of special flood hazard. See 20.25H.180.

c. Standards applicable to uses and activities in geologic hazards areas. See 20.25H.120.

d. Standards applicable to uses and activities in stream corridors. See 20.25H.080.

e. Standards applicable to uses and activities in wetlands. See 20.25H.100.

f. Standards applicable to uses and activities in shorelines. See 20.25E.080.

20.25H.065 Existing Nonconforming Development.

This Section applies to development and uses legally established within the critical area or critical area buffer prior to December 1, 2005 and not included as an existing allowed use or activity in Section 20.25H.060 above, except that Section 20.25E.055 applies to development and uses nonconforming to requirements for the shoreline critical area and shoreline critical area buffer. See performance standards at 20.25H.180 for provisions relating to the repair, remodeling, expansion or reconstruction of structures located in the Area of Special Flood Hazard. Any alterations to existing structures allowed under this Section 20.25H.065 shall also comply with those provisions. In the event of conflict, the provisions that result in most protection for the critical area or critical area buffer shall govern.

A. Existing Single-Family Residential Development. If no modifications to an existing structure or use are proposed, then the structure or use may continue without coming into compliance with the regulations of this Part 20.25H. Compliance may in whole or in part be required when changes to a structure or use are proposed, as follows:

1. Primary Structures.

a. Repair of an existing nonconforming primary structure is permitted.

b. Remodeling of an existing primary structure is permitted provided the fair market value of the remodel does not exceed 100 percent of the replacement value of the structure over any three-year period. If remodeling exceeds 100 percent of the replacement value over any three-year period, the structure shall be brought into compliance with existing Land Use Code requirements, including requirements of Part 20.25H.

c. An existing primary structure may not be expanded unless the expansion conforms to the regulations of this Code or unless the expansion is an expansion upwards within the existing footprint of the structure. However, expansion into the critical area buffer may be allowed, pursuant to a Critical Areas Land Use permit, where

expansion outside of the critical area buffer is not feasible and where the purpose of the expansion is to serve a function that is an essential component of a single-family residence. Expansion into the critical area is prohibited.

i. Where allowed, expansions into the critical area buffer shall be limited as follows:

(A) The expansion shall be along the existing line of nonconformity, unless such expansion is not feasible. Only when such expansion is not feasible may expansion encroach further into the critical area buffer.
(B) Expansions into the critical area or critical area buffer shall be the minimum necessary to achieve the intended functions of the expansion, but in no event may the footprint expansion within the critical area buffer exceed 500 square feet over the life of the structure. Expansions into stream corridor critical areas and critical area buffers allowed pursuant to the City's previous critical areas regulations (prior LUC Section 20.25H.085.B) shall be included in determining the allowed lifetime expansion;
(C) Areas of new permanent disturbance and all areas of temporary disturbance within the critical area buffer shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210; and
(D) Work within the critical area buffer shall comply with the applicable performance standards Part 20.25H for such critical area.

ii. For purposes of this section, expansion outside of the critical area buffer shall be considered not feasible only when, considering the function to be served by the expansion and the existing structure's layout and infrastructure (including plumbing, drainage and electrical systems):

(A) expansion away from the critical area buffer within the buildable area of the site will not realize the intended functions of the expansion; and
(B) expansion away from the critical area buffer, including into non-critical area setbacks modified pursuant to LUC 20.25H.040 will not realize the intended functions of the expansion; and
(C) expansion upwards to the maximum building height of the underlying land use district, within the existing footprint, or together with expansions permitted under subsections (ii)(A) and (B) above, will not realize the intended functions of the expansion.

d. If an existing primary structure or any portion thereof is destroyed by fire, explosion, or other unforeseen circumstance, it may be reconstructed to substantially the same condition as and within the footprint existing at the time of destruction; provided that such reconstruction is commenced within one year of the date of destruction and diligently pursued. Any proposal to improve the condition of the primary structure in connection with such reconstruction shall be subject to the limitations of subsection ii above. Additional disturbance outside of the area of previous nonconformity resulting from the reconstruction shall be restored pursuant to a mitigation plan approved by the Director under LUC 20.25H.210**.**

2. Non-primary Structures.

a. Repair and remodeling of an existing structure other than the primary structure is limited to minor, non-structural repairs, and repairs of mechanical systems within or supporting the accessory structure. If repair or remodeling exceeds these limits, the structure shall be brought into compliance with existing Land Use Code requirements, including requirements of Part 20.25H.

b. Expansion of existing structures, other than the primary structure, into the critical area or critical area buffer is prohibited.

c. If an existing structure, other than the primary structure, is destroyed by fire, explosion or other unforeseen circumstance requiring repairs consistent with those allowed under subsection 2 above, it may be reconstructed within the footprint existing at the time of destruction; provided that such reconstruction is commenced within one year of the date of destruction and diligently pursued. If such a structure is destroyed and requires structural or other repairs more extensive than those allowed under subsection 2 above, then any reconstruction of such structure shall be in compliance with existing Land Use Code requirements, including requirements of Part 20.25H. Additional disturbance outside of the area of previous nonconformity resulting from the reconstruction shall be restored pursuant to a mitigation plan approved by the Director under LUC 20.25H.210**.**

3. Existing Landscaping. Routine maintenance of existing legally established landscaping and landscape features developed prior to December 1, 2005 in the critical area or critical area buffer may be continued in accordance with this section. For purposes of this section, routine landscape maintenance activities include mowing, pruning, weeding, planting annuals, perennials, fruits and vegetables, and other activities associated with maintaining a legally established ornamental or garden landscape and landscape features. Also, for purposes of this subsection, landscape features refers to fences, trellises, rockeries and retaining walls, pathways, arbors, patios, play areas and other similar improvements. To be considered routine maintenance, activities shall have been consistently carried out so that the ornamental species predominate over native or invasive species. Wholesale clearing of areas within 25 feet of a critical area may be allowed only as a habitat improvement project under LUC 20.25H.070. Maintenance shall be performed with hand tools only, and no trees may be removed, except in accordance with LUC 20.25H.070. Use of fertilizers, insecticides and pesticides is prohibited unless performed in accordance with the City of Bellevue's "Environmental Best Management Practices" now or as hereafter amended.

B. Existing Multifamily and Nonresidential Development. The director may allow proportional compliance with the following requirements as provided for in LUC 20.20.560.C.4.

1. Primary structures.

a. Repair of an existing primary structure is permitted.

b. Remodeling of an existing primary structure is permitted provided the fair market value of the remodel does not exceed 100 percent of the replacement value of the structure over any three-year period. If remodeling exceeds 100 percent of the replacement value over any three-year period, the structure shall be brought into

compliance with existing Land Use Code requirements, including requirements of this Part.

c. An existing primary structure within the shoreline critical area buffer may not be expanded unless the expansion conforms to the requirements of the Code, including requirements of this Part and Part 20.25H.

d. If an existing primary structure or any portion thereof is destroyed by fire, explosion, or other unforeseen circumstance, it may be reconstructed to substantially the same condition as and consistent within the footprint in existence at the time of destruction; provided that such reconstruction is commenced within one year of the date of destruction and diligently pursued. Any proposal to improve the condition of the primary structure in connection with such reconstruction shall be subject to the limitations of subsection ii above. Additional disturbance outside of the area of the previous footprint resulting from the reconstruction shall be restored pursuant to a mitigation plan approved by the Director under LUC 20.25H.210**.**

2. Non-primary structures.

a. Repair and remodeling of an existing structure, other than the primary structure, is limited to minor, non-structural repairs, and repairs of mechanical systems within or supporting the structure. If repair or remodeling exceeds these limits, the structure shall be brought into compliance with existing Land Use Code requirements, including requirements of this Part.

b. Expansion of existing structures, other than the primary structure, into the shoreline critical area and critical area buffer is prohibited.

c. If an existing structure, other than the primary structure, is destroyed by fire, explosion or other unforeseen circumstance requiring repairs consistent with those allowed under subsection (i) above, it may be reconstructed within the footprint existing at the time of destruction; provided that such reconstruction is commenced within one year of the date of destruction and diligently pursued. Additional disturbance outside of the area of the previous footprint resulting from the reconstruction shall be restored pursuant to a mitigation plan approved by the Director under LUC 20.25H.210**.** If such a structure is destroyed and requires structural or other repairs more extensive than those allowed under subsection (i) above, then any reconstruction of such structure shall be in compliance with existing Land Use Code requirements, including requirements of this Part and Part 20.25H.

3. Existing Landscaping. Routine maintenance of existing legally established landscaping and landscape features developed prior to December 1, 2005 in the critical area or critical area buffer may be continued in accordance with this section. For purposes of this section, routine landscape maintenance activities include mowing, pruning, weeding, planting annuals, perennials, fruits and vegetables, and other activities associated with maintaining a legally established ornamental or garden landscape and landscape features. Also, for purposes of this subsection, landscape features refers to fences, trellises, rockeries and retaining walls, pathways, arbors, patios, play areas and other similar improvements. To be considered routine maintenance, activities shall have been consistently carried out so that the ornamental species predominate over native or invasive species. Wholesale clearing of areas within 25 feet of a critical area may be

allowed only as a habitat improvement project under LUC 20.25H.070. Maintenance shall be performed with hand tools only, and no trees may be removed, except in accordance with LUC 20.25H.070. Use of fertilizers, insecticides and pesticides is prohibited unless performed in accordance with the City of Bellevue's "Environmental Best Management Practices" now or as hereafter amended.

20.25H.070 New Uses and Activities. The uses and activities described in subsection C may be undertaken in a critical area or critical area buffer if all of the requirements of this section are met. A critical areas land use permit shall be required, in addition to the permit requirements applicable to the underlying use or activity. This section shall not apply to the Areas of Special Flood Hazard.

A. Hierarchy of Alteration. Where an activity is proposed on a site with more than one type of critical area, preference shall be given to disturbing those critical areas with the least sensitivity to human disturbance, based on a consideration of both their current functions and values, and future functions and values if left undisturbed.

B. Performance Standards. In addition to the performance standards including in subsection C for each listed use or activity, the following additional performance standards may apply:

1. General. Any use or activity approved pursuant to this section 20.25H.070 shall comply with the following performance standards. As used in this section "facilities and systems" is a general term that encompasses all structures and improvements associated with the allowed uses and activities described in subsection C:

   a. New or expanded facilities and systems are allowed within the critical area or critical area buffer only where no technically feasible alternative with less impact on the critical area or critical area buffer exists. A determination of technically feasible alternatives will consider:

      i. the location of existing infrastructure;
      ii. the function or objective of the proposed new or expanded facility or system;
      iii. demonstration that no alternative location or configuration outside of the critical area or critical area buffer achieves the stated function or objective, including construction of new or expanded facilities or systems outside of the critical area;
      iv. whether the cost of avoiding disturbance is disproportionate as compared to the environmental impact of proposed disturbance; and
      v. the ability of both permanent and temporary disturbance to be mitigated.

   b. If the applicant demonstrates no technically feasible alternative with less impact on the critical area or critical area buffer exists, then the applicant shall comply with the following:

      i. location and design shall result in the least impacts on the critical area or critical area buffer;
      ii. Disturbance of the critical area and critical area buffer, including disturbance of vegetation and soils, shall be minimized;
      iii. Disturbance shall not occur in habitat used for salmonid rearing or spawning or by any species of local importance unless no other technically feasible location exists;

iv. Any crossing over of a wetland or stream corridor shall be designed to minimize critical area coverage and critical area disturbance, for example by use of bridge, boring, or open cut and perpendicular crossings, and shall be the minimum width necessary to accommodate the intended function or objective; provided that the Director may require that the facility to designed to accommodate additional facilities where the likelihood of additional facilities exists, and one consolidated corridor would result in fewer impacts to the critical area or critical area buffer than multiple intrusions into the critical area or critical area buffer;
v. All work shall be consistent with applicable City of Bellevue codes and standards;
vi. The facility or system shall not have a significant adverse impact on overall aquatic area flow peaks, duration or volume or flood storage capacity, or hydroperiod;
vii. Associated parking and other support functions, including, for example, mechanical equipment and maintenance sheds, must be located outside critical area or critical area buffer except where no feasible alternative exists; and
viii. Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210.

2. Specific Standards. In addition to the above generally-applicable standards the following standards may also apply. In the event of a conflict between the generally-applicable performance standards and specific standards, those more protective of critical area functions and values shall govern.

a. Standards applicable to uses and activities in stream corridors. See 20.25H.080.

b. Standards applicable to uses and activities in wetlands. See 20.25H.100.

c. Standards applicable to uses and activities in shorelines. See 20.25E.080.

d. Standards applicable to uses and activities in geologic hazards areas. See 20.25H.125.

e. Standards applicable to uses and activities in the areas of special flood hazard. See 20.25H.180.

C. Allowed Uses and Activities.

1. Emergency Actions. Emergency actions are those that must be undertaken immediately or within a time too short to allow full compliance with this Part 20.25H, to avoid an imminent threat to public health or safety, to prevent an imminent danger to public or private property, or to prevent an imminent threat of serious environmental degradation. The Director, or the designee thereof, shall designate when such an action constitutes an emergency action.

Emergency actions within the critical area or critical area buffer shall use reasonable methods to address the emergency; in addition, they must have the least possible impact to the critical area or critical area buffer. The person or agency undertaking such action shall notify the Director of the existence of the emergency and emergency actions within one (1) working day following commencement of the emergency activity. Within five (5) working days following completion of the emergency activity, the person or

agency undertaking such action shall provide a written description of the work undertaken, site plan, description of pre-emergency site conditions and such other information required by the Director to make the determination required under this subsection.

Within thirty (30) days, the Director shall determine if the action taken was within the scope of the emergency actions allowed in this subsection. If the Director determines that the action taken, or any part of the action taken, was beyond the scope of an allowed emergency action, then the applicant shall be subject to penalties and enforcement pursuant to BCC Chapter 1.18. If the Director determines that the action taken was within the scope of an allowed emergency action, the applicant shall submit a restoration and/or mitigation plan pursuant to LUC 20.25H.210 based on the impacts of the emergency action to the critical area or critical area buffer.

2. **New or Expanded Utility Facility or Systems (including stormwater facilities).** In the event of a conflict between this section and the utilities code, the utilities code shall prevail.

3. **Public Flood Protection Measures.** New public flood protection measures and expansion of existing ones may be permitted only in accordance with a design prepared by a qualified professional and reviewed and approved by the Director.

4. **Instream Structures.** Instream structures, such as, but not limited to, high flow bypasses, sediment ponds, instream ponds, retention and detention facilities, dams, and weirs, shall be allowed only as part of an approved watershed basin restoration project approved by the Director and upon acquisition of any required state or federal permits.

5. **New or Expanded Public Rights of Way, private roads, access easements, and driveways.**

6. **New or Expanded Bridges and Culverts.** New culverts shall be designed in accordance with the Washington State Department of Fish and Wildlife “Design of Road Culverts for Fish Passage” now or as hereafter amended.

7. **New or Expanded Essential Public Facilities.**

8. **Private Non-motorized Trails.** New non-motorized trails within the critical area or critical area buffer are limited to those serving nonresidential uses, multifamily residential uses and more than one single-family lot.

9. **New and Expanded City and Public Parks.** The technical feasibility analysis and general performance standards of subsection B.1 above shall not apply to the establishment of new or expanded city and public parks, unless otherwise noted in this subsection C.9.

    a. **Trails.** New non-motorized trails within the critical area or critical area buffer must meet following standards:

i. Trail location and design shall result in the least impacts on the critical area or critical area buffer;
ii. Trails shall be designed to compliment and enhance the environmental, educational, and social functions and values of the critical area with trail design and construction focused on managing and controlling public access and limiting uncontrolled access;
iii. Trails shall be designed to avoid disturbance of significant trees and to limit disturbance of native understory vegetation;
iv. Trails shall be designed to avoid disturbance of habitat used for salmonid rearing or spawning or by any species of local importance;
v. The trail shall be the minimum width necessary to accommodate the intended function or objective;
vi. All work shall be consistent with the City of Bellevue's "Environmental Best Management Practices" and all applicable City of Bellevue codes and standards;
vii. The facility shall not significantly change or diminish overall aquatic area flow peaks, duration or volume or flood storage capacity, or hydroperiod;
viii. Where feasible and consistent with any accessibility requirements, any trail shall be constructed of pervious materials;
ix. Crossings over and penetrations into wetlands and stream corridors shall be generally perpendicular to the critical area, and shall be accomplished by bridging or other technique designed to minimize critical area disturbance considering the entire trail segment and function; and
x. Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210.

b. Public Use Structures.

i. New or expanded permanent public use structures, including interpretative centers, community centers, and other structures designed for public use and access are allowed in the critical area or critical area buffer only if no technically feasible alternative with less impact on the critical area or critical area buffer exists. A determination of technically feasible alternatives will consider:

(A) the location of existing infrastructure;
(B) the function or objective of the proposed new or expanded structure;
(C) demonstration that no alternative achieves the stated function or objective;
(D) whether the cost of avoiding disturbance is disproportionate as compared to the environmental impact of proposed disturbance; and
(E) the ability of both permanent and temporary disturbance to be mitigated.

ii. If the applicant demonstrates no technically feasible alternative with less impact on the critical area or critical area buffer exists, then the applicant shall comply with the generally applicable performance standards of subsection B.1 above.

c. Other parks uses – Other parks uses proposed within the critical area or critical area buffer shall meet the generally applicable performance standards of B.1.b above, provided that active use playfields shall not be allowed in critical area or critical area buffers; and provided that parking supporting parks uses shall be allowed in a critical area buffer only if no feasible alternative exists.

10. Vegetation Management. The following vegetation removal activities are allowed within the critical area or critical area buffer, subject to meeting the required performance standards and obtaining a clearing and grading permit, BCC 23.76. The technical feasibility analysis and general performance standards of subsection B.1 above shall not apply to activities approved under this subsection:

a. **Noxious Species.** The removal of the following vegetation with hand labor and hand-operated equipment:

i. Invasive and noxious weeds;
ii. English Ivy (*Hedera helix*);
iii. Himalayan blackberry (*Rubus discolor, R. procerus*); and
iv. Evergreen blackberry (*Rubus laciniatus*);

b. **Hazard Trees.** The removal of trees from the critical area or critical area buffer that are hazardous, posing a threat to public safety, or posing an imminent risk of damage to an existing structure, public or private road or sidewalk, or other permanent improvement, provided that:

i. The applicant submits a report from a certified arborist, registered landscape architect, or professional forester that documents the hazard and provides a replanting schedule for the replacement trees;
ii. Tree cutting shall be limited to pruning and crown thinning, unless otherwise justified by a qualified professional. Where pruning or crown thinning is not sufficient to address the hazard, trees should be converted to wildlife snags and completely removed only where no other option removes the identified hazard;
iii. All vegetation cut (tree stems, branches, etc.) shall be left within the critical area or buffer unless removal is warranted due to the potential for creating a fire hazard or for disease or pest transmittal to other healthy vegetation;
iv. The landowner shall replace any trees that are removed with new trees at a ratio of two replacement trees for each tree removed (2:1) within one (1) year pursuant to a restoration plan meeting the requirements of LUC 20.25H.210. Replacement trees may be planted at a different, nearby location within the critical area buffer if it can be determined that planting in the same location would create a new hazard or potentially damage the critical area. Replacement trees shall be species that are native and indigenous to the site and a minimum of one (1) inch in diameter-at-breast height (dbh) for deciduous trees and a minimum of six (6) feet in height for evergreen trees as measured from the top of the root ball;
v. If a tree to be removed provides critical habitat, such as an eagle perch, a qualified wildlife biologist shall be consulted to determine timing and methods or removal that will minimize impacts; and
vi. Hazard trees determined to pose an imminent threat or danger to public health or safety, to public or private property, or of serious environmental degradation may be removed or pruned by the landowner on whose property the tree is located prior to receiving written approval from city, provided that the landowner makes reasonable efforts to notify the city, and within fourteen (14) days following such action, the landowner shall submit a restoration plan that demonstrates compliance with the provisions of this Title.

c. Forest Health. Measures to control a fire or halt the spread of disease or damaging insects, provided that the removed vegetation shall be replaced in-kind or with similar native species within one (1) year pursuant to a restoration plan meeting the requirements of LUC 20.25H.210. Replacement trees may be planted at a different, nearby location within the critical area buffer if it can be determined that planting in the same location would create a new fire hazard or potentially damage the critical area. Replacement trees shall be species that are native and indigenous to the site and a minimum of one (1) inch in diameter-at-breast height (dbh) for deciduous trees and a minimum of six (6) feet in height for evergreen trees as measured from the top of the root ball.

d. Fire Safety. Where required pursuant to the International Fire Code, Section 304.1.2, as adopted and amended by the City of Bellevue, vegetation may be removed from the critical area or critical area buffer, provided that the removed vegetation shall be replaced in-kind or with similar native species within one (1) year pursuant to a restoration plan meeting the requirements of LUC 20.25H.210. Replacement vegetation may be planted at a different, nearby location within the critical area buffer in order to maintain an appropriate cleared area around the primary structure as determined by the Fire Department. Replacement trees shall be species that are native and indigenous to the site and a minimum of one (1) inch in diameter-at-breast height (dbh) for deciduous trees and a minimum of six (6) feet in height for evergreen trees as measured from the top of the root ball.

e. Maintenance for other Allowed Activities. Vegetation may be periodically removed from the critical area or critical area buffer as part of an on-going routine maintenance plan for other allowed activities. Such removal shall be pursuant to a Vegetation Management Plan meeting the requirements of this subsection.

(i) The Vegetation Management Plan shall be prepared by a qualified professional.
(ii) The Vegetation Management Plan shall include:

(A) A description of existing site conditions;
(B) A site history;
(C) A discussion of the Plan objectives;
(D) A description of all sensitive features;
(E) Identification of soils, existing vegetation, and wildlife habitat present on the site;
(F) Allowed work windows;
(G) A clear delineation of the area within which clearing and other vegetation management practices are allowed under the plan; and
(H) Short and long term management prescriptions, including restoration and revegetation requirements. Cleared areas shall be restored and revegetated with native species to the extent such vegetation does not interfere with the function of the allowed structure, trail, facility or system.

11. Habitat Improvement Projects. Disturbance, clearing and grading is allowed in the critical area or critical area buffer for habitat improvement projects demonstrating an improvement to functions and values of a critical area or buffer. The technical feasibility analysis and general performance standards of subsection B.1 above shall not apply to activities approved under this subsection. Habitat improvement projects shall be:

a. sponsored or co-sponsored by a public agency or federally-recognized tribe and whose primary function is habitat restoration;
b. Prepared by a qualified professional; or
c. Approved by the Director pursuant to LUC 20.25H.230.

12. **Stewardship Projects – single-family residential lots.** Pursuant to a restoration plan approved under LUC 20.25H.210, the director may approve proposals to encroach into the first 35 percent (or first 10 feet, whichever is greater) of a required critical area buffer for certain passive recreational uses, in conjunction with an approved restoration plan for the remaining critical area buffer that enhances existing vegetation. Allowed encroachments shall be limited to non-structural improvements that utilize pervious surfaces, such as pervious patios or decks, trails, rockeries, trellises and pervious play areas. The Director may require that the restoration plan be recorded with the King County Division of Records and Elections, and may require allowed improvements to be removed if the restoration plan is violated.

13. **Forest Practices.** The technical feasibility analysis and general performance standards of subsection B.1 above shall not apply to activities approved under this subsection. Forest practices regulated and conducted in accordance with the provisions of Chapter 76.09 RCW, now or as hereafter amended, and forest practices regulations, Title 222 WAC, now or as hereafter amended, and those that are exempt from the City's jurisdiction, provided that forest practice conversions are not exempt.

14. **Aquaculture.** The technical feasibility analysis and general performance standards of subsection B.1 above shall not apply to activities approved under this subsection. Aquaculture Uses.

a. Aquaculture development must be conducted in a way which does not adversely affect the aesthetic or environmental quality of the wetland and interrelated stream habitat; and
b. Aquaculture must to the extent feasible use underwater structures for fish rearing facilities.

IV. STREAM CORRIDORS

20.25H.075 Designation of Critical Area and Buffers.

A. Designation of Stream Corridors. The following stream corridors are hereby designated as critical areas subject to the regulations of this Part 20.25H.

1**. "Type S Water"** means all waters, other than shoreline critical areas designated under LUC 20.25E.017, within their bankfull width, as inventoried as "shorelines of the state" under chapter 90.58 RCW and the rules promulgated pursuant to chapter 90.58 RCW including periodically inundated areas of their associated wetlands.

2. **"Type F Water"** means segments of waters that are not Type S Waters, and that contain fish or fish habitat, including waters diverted for use by a federal, state, or tribal fish hatchery from the point of diversion for one thousand five hundred feet or the entire tributary if the tributary is highly significant for protection of downstream water quality.

3. **"Type N Water"** means all segments of waters that are not type S or type F waters and that are physically connected to a type S or F waters by an above ground channel system, stream or wetland.

4. **"Type O Water"** means all segments of waters that are not type S, F or N waters and that are not physically connected to type S, F or N waters by an above ground channel system, stream, or wetland.

B. Designation of Stream Corridor Critical Area Buffers. The following critical areas buffers are established.

1. Standard Buffers:

a. Open Stream Corridors. Open stream corridors shall have the following critical area buffers, measured from the top-of-bank:

Type S	100 feet
Type F	100 feet
Type N	50 feet
Type O	25 feet

b. Closed Stream Corridors. Regardless of type, closed stream corridors shall have a setback of 10 feet; provided that closed stream segments in the Kelsey Creek drainage basin shall have a setback of 50 feet or the setback required for its stream type, whichever is less.

2. Buffer Modification. Modifications to the standard buffer may be approved pursuant to this section. Modifications to the standard buffer that do not meet the criteria of this subsection may be considered through a critical areas report, LUC 20.25H.230:

a. Buffer averaging. Buffer averaging may be allowed if all the following criteria are satisfied. Proposals to modify the standard buffer under this subsection shall require a critical areas land use permit, in addition to any permit or approval required for the underlying use or activity.

i. Buffer averaging may be approved only if the applicant demonstrates that a modification to non-protected area setbacks pursuant to LUC 20.25H.040 would not accommodate the proposed development in a manner consistent with its intended use and function.

ii. Through buffer averaging, the ecological structure and function of the resulting buffer is equivalent to or greater than the structure and function before averaging;

iii. The total buffer area is not reduced;

iv. The buffer area is contiguous;

v. Averaging does not result in the reduction of the minimum buffer for the buffer area waterward of the top of the associated steep slopes;

vi. At no point is the critical area buffer width less than 75% of the required buffer dimension.

b. Transportation or Utility infrastructure. Where a legally established right of way, railroad right of way or other similar infrastructure of a linear nature crosses a stream corridor critical area buffer, the edge of the right of way shall be the extent of the buffer, if the part of the critical area buffer on the other side of the roadway provides insignificant biological or hydrological function in relation to the portion of the buffer adjacent to the stream corridor.

C. Structure Setbacks.

1. General.

The requirements of this section apply along with any other dimensional requirements of the Land Use Code (see LUC 20.20.010, 20.20.130, 20.20.190 and Parts 20.25A – 20.25G). The most restrictive dimension controls. Structure setbacks are required in order to:

a. Minimize long-term impacts of development adjacent to critical areas and critical area buffers; and

b. Protect critical areas and critical area buffers from adverse impacts during construction.

2. Minimum Setback of Structures.

a. Open Stream Corridors. The following structure setbacks apply, measured from the edge of the critical area buffer:

Type S waters	20 feet
Type F waters	20 feet
Type N waters	15 feet
Type O waters	10 feet

b. Closed Stream Corridors. Structure setbacks are not required on closed stream segments.

3. Structure Setback Modification. The director may waive or modify the structure setback as part of the permit or approval for the underlying proposal if the applicant demonstrates that:

a. Water quality, or slope stability as documented in a geotechnical report, will not be adversely affected;

b. Encroachment into the structure setback will not disturb habitat of a species of local importance; and

c. Vegetation in the critical area and critical area buffer will not be disturbed by construction or maintenance activities and will be maintained in a healthy condition.

20.25H.080 Performance Standards.

A. General. Development on sites with a Types S or F stream corridor or associated critical area buffer shall be subject to the following performance standards.

1. Direct lights away from the stream corridor.

2. Locate the activity that generates noise away from the stream corridor such as parking lots, generators, and residential uses.
3. Route toxic runoff from new impervious area away from the stream corridor.
4. Allow treated water to enter the stream corridor buffer.

5. Plant the buffer with dense vegetation at the edge of the stream corridor buffer to limit pet or human use.

6. Use of pesticides, insecticides and fertilizers within 150 feet of the edge of the stream corridor buffer shall be in accordance with the City of Bellevue's "Environmental Best Management Practices, now or as hereafter amended.

B. Performance Standards – Reasonable Use Exception.

1. Where access over a stream corridor or stream corridor buffer is required, the crossing must be by bridging. Crossings shall occur at a location providing for the least impact to the critical area or critical area buffer.

2. Bridged structures must incorporate grating, wood slats or other techniques that will allow for a minimum of 50 percent light penetration. Structural supports, such as pilings, for the bridge structure shall be limited in number, size and material to provide the least impact on the critical area or critical area buffer. Utility infrastructure shall be incorporated into the bridge structure to the maximum extent technically feasible.

20.25H.085 Mitigation and Monitoring – Additional Provisions.

A. Mitigation Preference. In addition to the provisions of LUC 20.25H.210, mitigation plans for stream corridors and stream corridor critical area buffers shall provide mitigation for impacts to critical area functions and values in the following order of preference:

1. On-site;

2. Off-site, in the same sub-drainage basin;

3. Off-site, out of the sub-drainage basin but in the same drainage basin.

Mitigation off-site and out of the drainage basin shall not be permitted.

B. Buffer Mitigation Ratio. Critical area buffer disturbed or impacted under this Part 20.25H shall be replaced at a ratio of 2-to-1.

20.25H.090 Critical Areas Report – Additional Provisions. In addition to the provisions of LUC 20.25H.230, any modification to a stream corridor or stream corridor critical area buffer shall comply with the requirements of this section.

Limitation on Modification. In no event may a stream corridor be modified through a critical area report. A stream corridor buffer shall not be modified below the following widths, measured from the top-of-bank:

Type S waters	35 feet
Type F waters	35 feet
Type N waters	25 feet
Type O waters	10 feet

V. WETLANDS

20.25H.095 Designation of Critical Area and Buffers

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

B. Designation of Critical Area. The following wetlands are hereby designated as critical areas subject to the requirements of this Part 20.25H. Wetlands are classified into category I, category II, category III and category IV wetlands based on the adopted Washington State Wetland Rating System for Western Washington, Washington State Department of Ecology publication number 04-06-025, published August, 2004.

1. **Category I wetlands.** Category I wetlands are those that 1) represent a unique or rare wetland type; or 2) are more sensitive to disturbance than most wetlands; or 3) are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime; or 4) provide a high level of functions.

2. **Category II wetlands**. Category II wetlands are difficult, though not impossible, to replace, and provide high levels of some functions. These wetlands occur more commonly than Category I wetlands, but still need a relatively high level of protection. Category II wetlands in western Washington include: wetlands scoring between 51-69 points (out of 100) on the questions related to the functions present are Category II wetlands. Wetlands scoring 51-69 points were judged to perform most functions relatively well, or performed one group of functions very well and the other two moderately well.

3. **Category III wetlands.** Category III wetlands are wetlands with a moderate level of functions (scores between 30 -50 points). Wetlands scoring between 30 -50 points

generally have been disturbed in some ways, and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands.

4. **Category IV wetlands over 2500 square feet.** Category IV wetlands have the lowest levels of functions (scores less than 30 points) and are often heavily disturbed. These are wetlands that we should be able to replace, and in some cases be able to improve. However, experience has shown that replacement cannot be guaranteed in any specific case. These wetlands may provide some important functions, and also need to be protected.

C. Designation of Wetland Critical Area Buffer: The following critical area buffers are hereby established. Buffers are measured from the wetland boundary.

1. Standard Buffer

Category	Wetland Characteristic	Buffer
I	Natural Heritage wetlands	190 feet
	Bogs	190 feet
	Forested	Based on score for habitat or water quality functions
	Habitat score of 29 to 36	225 feet
	Habitat score of 20 to 28	110 feet
	Water quality score of 24 to 32 and habitat score of less than 20	75 feet
	Not meeting any of the above	75 feet
II	Habitat score of 29 to 36	225 feet
	Habitat score of 20 to 28	110 feet
	Water quality score of 24 to 32 and habitat score of less than 20	75 feet
	Not meeting any of the above	75 feet
III	Habitat score of 20 to 28 points	110 feet
	Not meeting any of the above	60 feet
IV over 2500 square feet	Score for functions less than 30 points	40

2. **Buffer Modification.** Modifications to the standard buffer may be approved pursuant to this section. Modifications to the standard buffer that do not meet the criteria of this subsection may be considered through a critical areas report, LUC 20.25H.230:

a. Buffer averaging. Buffer averaging may be allowed if all the following criteria are satisfied. Proposals to modify the standard buffer under this subsection shall require a critical areas land use permit, in addition to any permit or approval required for the underlying use or activity.

i. Buffer averaging may be approved only if the applicant demonstrates that a modification to non-protected area setbacks pursuant to LUC 20.25H.040 would not accommodate the proposed development in a manner consistent with its intended use and function.

ii. Through buffer averaging, the ecological structure and function of the resulting buffer is equivalent to or greater than the structure and function before averaging;

iii. The total buffer area is not reduced;

iv. The buffer area is contiguous;

v. Averaging does not result in the reduction of the minimum buffer for the buffer area waterward of the top of the associated steep slopes;

vi. At no point is the critical area buffer width less than 75% of the required buffer dimension.

b. Transportation or Utility infrastructure. Where a legally established right of way, railroad right of way or other similar infrastructure of a linear nature crosses a wetland critical area buffer, the edge of the right of way shall be the extent of the buffer, if the part of the critical area buffer on the other side of the roadway provides insignificant biological or hydrological function in relation to the portion of the buffer adjacent to the wetland.

D. Structure Setbacks.

1. General.

The requirements of this section apply along with any other dimensional requirements of the Land Use Code (see LUC 20.20.010, 20.20.130, 20.20.190 and Parts 20.25A – 20.25G). The most restrictive dimension controls. Structure setbacks are required in order to:

a. Minimize long-term impacts of development adjacent to critical areas and critical area buffers; and

b. Protect critical areas and critical area buffers from adverse impacts during construction.

2. Minimum Setback of Structures. The following structure setbacks apply, measured from the edge of the critical area buffer:

Category I wetlands	20 feet
Category II wetlands	20 feet
Category III wetlands	15 feet

Category IV wetlands	none required

3. **Setback Modification**. The director may waive or modify the structure setback as part of the permit or approval for the underlying proposal if the applicant demonstrates that:

   a. Water quality, or slope stability as documented in a geotechnical report, will not be adversely affected;

   b. Encroachment into the structure setback will not disturb habitat of a species of local importance; and

   c. Vegetation in the critical area and critical area buffer will not be disturbed by construction or maintenance activities and will be maintained in a healthy condition.

20.25H.100 Performance Standards.

A. General. Development on sites with a wetland or wetland critical area buffer shall be subject to the following performance standards.

1. Direct lights away from the wetland.

2. Locate the activity that generates noise away from the wetland such as parking lots, generators, and residential uses.
3. Route toxic runoff from new impervious area away from the wetlands.
4. Allow treated water to enter the wetland buffer.

5. Plant the buffer with dense vegetation at the edge of the wetland to limit pet or human use.

6. Use of pesticides, insecticides and fertilizers within 150 feet of the edge of the stream corridor buffer shall be in accordance with the City of Bellevue's "Environmental Best Management Practices, now or as hereafter amended.

B. Performance Standards – Reasonable Use Exception.

1. Where access over a wetland or wetland buffer is required, the crossing must be by bridging. Crossings shall occur at a location providing for the least impact to the critical area or critical area buffer.

2. Bridged structures must incorporate grating, wood slats or other techniques that will allow for a minimum of 50 percent light penetration. Structural supports, such as pilings, for the bridge structure shall be limited in number, size and material to provide the least impact on the critical area or critical area buffer. Utility infrastructure shall be incorporated into the bridge structure to the maximum extent technically feasible.

20.25H.105 Mitigation and Monitoring – Additional Provisions. In addition to the provisions of LUC 20.25H.210, mitigation plans designed to mitigate impacts to wetlands and wetland critical area buffers shall meet the requirements of this section.

A. Preference of Mitigation Actions. Mitigation actions that require compensation by replacing, enhancing, or substitution shall occur in the following order of preference:

1. Restoring wetlands on upland sites that were formerly wetlands.

2. Creating wetlands on disturbed upland sites such as those with vegetative cover consisting primarily of non-native introduced species. This should only be attempted when there is a consistent source of hydrology and it can be shown that the surface and subsurface hydrologic regime is conducive for the wetland community that is being designed.

3. Enhancing significantly degraded wetlands.

B. Type and Location of Mitigation. Unless it is demonstrated that a higher level of ecological functioning would result from an alternate approach, compensatory mitigation for ecological functions shall be either in-kind and on-site, or in-kind and within the same drainage sub-basin. Mitigation actions shall be conducted within the same sub-drainage basin and on the site as the alteration except when all of the following apply:

1. There are no reasonable on-site or in-subdrainage basin opportunities or on-site and in-subdrainage basin opportunities do not have a high likelihood of success, after a determination of the natural capacity of the site to mitigate for the impacts. Consideration should include: anticipated wetland mitigation replacement ratios, buffer conditions and proposed widths, hydrogeomorphic classes of on-site wetlands when restored, proposed flood storage capacity, potential to mitigate riparian fish and wildlife impacts (such as connectivity);

2. Off-site mitigation has a greater likelihood of providing equal or improved wetland functions than the impacted wetland; and

3. Off-site locations shall be in the same sub-drainage basin unless established watershed goals for water quality, flood or conveyance, habitat, or other wetland functions have been established and strongly justify location of mitigation at another site.

C. Mitigation Ratios

1. **Acreage Replacement Ratios.** The following ratios shall apply to creation or restoration that is in-kind, is on-site, is the same category, is timed prior to or concurrent with alteration, and has a high probability of success. The first number specifies the acreage of replacement wetlands and the second specifies the acreage of wetlands altered.

Category I	6-to-1
Category II	3-to-1
Category III	2-to-1
Category IV	1.5-to-1

2. Increased Replacement Ratio. The director may increase the ratios where proposed mitigation will result in a lower category wetland or reduced functions relative to the wetland being impacted.

3. **Buffer Mitigation Ratio.** Critical area buffer disturbed or impacted under this Part 20.25H shall be replaced at a ratio of 2-to-1.

E. Wetlands Enhancement as Mitigation. Impacts to wetland functions may be mitigated by enhancement of existing significantly degraded wetlands. Applicants proposing to enhance wetlands must produce a critical area report meeting the requirements of LUC 20.25H.110 and 20.25H.230 that identifies how enhancement will increase the functions of the degraded wetland and how this increase will adequately mitigate for the loss of wetland area and function at the impact site. An enhancement proposal must also show whether existing wetland functions will be reduced by the enhancement actions.

20.25H.110 Critical Area Report – Additional Provisions. In addition to the general critical area report requirements of LUC 20.25H.230, critical area reports for wetlands must meet the requirements of this section.

A. Limitation on Modification. In no event may a wetland be modified through a critical area report. A wetland buffer shall not be modified below the following widths, measured from the edge of the wetland:

Category I	50 ft
Category II	50 ft
Category III	35 ft
Category IV	10 ft

B. Area Addressed in Critical Area Report. In addition to the general requirements of LUC 20.25H.230, a critical areas report for wetlands shall include a written assessment and accompanying maps of the wetlands and buffers within three hundred (300) feet of the project area, including the following information at a minimum:

1. A discussion of measures, including avoidance, minimization, and mitigation, proposed to preserve existing wetlands and restore any wetlands that were degraded prior to the current proposed land use activity.

2. A habitat and native vegetation conservation strategy that addresses methods to protect and enhance on-site habitat and wetland functions.

3. Functional evaluation for the wetland and adjacent buffer using a local or state agency staff-recognized method and including the reference of the method and all data sheets.

VI. SHORELINES

20.25H.115 Designation of Critical Area and Buffers.

A. Designation of Shoreline Critical Areas. See LUC 20.25E.017 for designated shoreline critical areas.

B. Designation of Shoreline Critical Area Buffers. The following critical areas buffers are established. The shoreline critical area buffer on Lake Sammamish shall be measured from elevation 31.8 NAVD 88. The shoreline critical area buffer on all other shoreline critical areas shall be measured from the ordinary high water mark.

1. Standard Buffers:

All shoreline critical areas: 50 ft.

2. Buffer Modification. Modifications to the standard buffer may be approved pursuant to this section as part of the permit or approval for the underlying proposal. Modifications to the standard buffer that do not meet the criteria of this subsection may be considered through a critical areas report, LUC 20.25H.230:

a. Adjustment Based on Surrounding Development. The standard buffer may be modified to reflect the buffer existing on developed shoreline properties immediately abutting the site. Such modification shall allow only a primary structure to encroach into the standard buffer. The buffer adjustment shall be determined by connecting the portion of each adjacent primary structure that most encroaches into the standard buffer. The line established represents the shoreline critical area buffer for the site, however, in no event may the shoreline critical area buffer be less than 25 feet.

b. Transportation or Utility infrastructure. Where a legally established right of way, railroad right of way or other similar infrastructure of a linear nature crosses a shoreline critical area buffer, the edge of the right of way shall be the extent of the buffer, if the part of the critical area buffer on the other side of the right of way provides insignificant biological or hydrological function in relation to the portion of the buffer adjacent to the shoreline.

VII. GEOLOGIC HAZARD AREAS

20.25H.120 Designation of Critical Area and Buffers.

A. Designation of Critical Area. The following geologic hazard areas are hereby designated critical areas subject to the regulations of this Part 20.25H.

1. Landslide Hazards. Areas of slopes of 15 percent or more with more than 10 feet of rise, which also display any of the following characteristics:

a. Areas of historic failures, including those areas designated as Quaternary slumps, earthflows, mudflows, or landslides.
b. Areas that have shown movement during the Holocene Epoch (past 13,500 years) or that are underlain by landslide deposits.
c. Slopes that are parallel or subparallel to planes of weakness in subsurface materials.
d. Slopes exhibiting geomorphological features indicative of past failures, such as hummocky ground and back-rotated benches on slopes.
e. Areas with seeps indicating a shallow ground water table on or adjacent to the slope face.
f. Areas of potential instability because of rapid stream incision, stream bank erosion, and undercutting by wave action.

2. Steep Slopes. Slopes of 40 percent or more, provided that slopes of 40 percent or more that do not exceed 1000 square feet in area and do not exceed 10 feet in rise shall not be considered critical areas.

3. Coal Mine Hazards. Areas designated on the Coal Mine Areas maps or in the City's Coal Mine Area Regulations, LUC 20.25H**.**130, as potentially affected by abandoned coal mines; provided, that compliance with the Coal Mine Area Regulations shall constitute compliance with the requirements of this chapter in regard to coal mines.

B. Geologic Hazard Area buffers. The following critical area buffers are established.

1. Standard Buffers:

   a. Landslide Hazards.

      i. Top-of-slope setback of 50 feet
      ii. Toe-of-slope setback of 75 feet

   b. Steep Slopes.

      i. Top-of-slope setback of 50 feet
      ii. Toe-of-slope setback of 75 feet

2. Buffer Modification.

   a. Modifications to the standard buffer may be considered through a critical areas report, LUC 20.25H.230.

   b. Transportation or Utility infrastructure. Where a legally established right of way, railroad right of way or other similar infrastructure of a linear nature crosses a geologic hazard critical area buffer, the edge of the right of way shall be the extent of the buffer, if the part of the critical area buffer on the other side of the roadway provides insignificant biological or hydrological function in relation to the portion of the buffer adjacent to the wetland.

20.25H.125. Performance Standards – Landslide Hazards and Steep Slopes. In addition to generally applicable performance standards set forth in LUC 20.25H.060 and 20.25H.070, development within a landslide hazard or steep slope critical area or the critical area buffers of such hazards shall be designed to meet the following additional performance standards. The requirement for long-term slope stability shall exclude designs that require regular and periodic maintenance to maintain their level of function.

A. General.

1. Structures and improvements shall minimize alterations to the natural contour of the slope, and foundations shall be tiered where possible to conform to existing topography;

2. Structures and improvements shall be located to preserve the most critical portion of the site and its natural landforms and vegetation;

3. The proposed development shall not result in greater risk or a need for increased buffers on neighboring properties;

4. The use of retaining walls that allow the maintenance of existing natural slope area is preferred over graded artificial slopes; and

5. Development shall be designed to minimize impervious surfaces within the critical area and critical area buffer.

B. Reasonable Use Exception.

1. Where change in grade outside the building footprint is necessary, the site retention system should be stepped and regrading should be designed to minimize topographic modification. On slopes in excess of 25 percent, grading for yard area may be disallowed where inconsistent with this criteria;

2. Building foundation walls shall be utilized as retaining walls rather than rockeries or retaining structures built separately and away from the building wherever feasible. Freestanding retaining devices are only permitted when they cannot be designed as structural elements of the building foundation;

3. On slopes in excess of 25 percent, use of pole-type construction which conforms to the existing topography is required where feasible. If pole-type construction is not technically feasible, the structure must be tiered to conform to the existing topography and to minimize topographic modification;

4. On slopes in excess of 25 percent, piled deck support structures are required where technically feasible for parking or garages over fill-based construction types;

5. Areas of new permanent disturbance and all areas of temporary disturbance shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.210.

20.25H.130. Performance Standards -- Coal Mine Hazard Area.

A. Application of Regulation and Disclosure on Plats.

1. The subdivision or development of land potentially affected by abandoned coal mines, as described in these regulations or as designated on the Coal Mine Area (CMA) map, Exhibit A, or the Coal Seams map, Exhibit B, maintained by the Department of Community Development (DCD), shall be subject to the requirements of this Regulation. Development includes construction of buildings, utilities, and other infrastructure as defined in section B. The requirements of this Regulation are in addition to other pertinent City of Bellevue requirements.

   EXCEPTIONS:

   (1) Additions to existing single family residences, in CMS zone 1, that were not originally subject to this Regulation, are exempted as follows:

   (a) Additions of 500 square feet or less of new covered floor area are

completely exempted.

(b) Additions and replacements which are less than 50% of the total proposed floor area are exempted, except for subsections 1.1.e, l.4.c, l.4.d, and l.4.e.

(2) Detached uninhabited structures less than 500 square feet in CMS. zone 1, which are accessory to single family residences and on the same property, are completely exempted.

2. Any subdivision or short subdivision that includes property designated as within a CMS zone shall disclose the designation on the face of the plat and shall include a reference to the requirements of this Regulation.

B. Definitions

1. Angle of Draw (also termed Limit Angle): The angle of inclination from the vertical of the line connecting the edge of the coal mine workings with the outer limit of the trough subsidence area. For inclined coal seams (such as those in the Coal Creek area), downdip and updip limit angles (which in general will not be identical) are defined at the downdip and updip limits of the coal mine workings, respectively. See Figure 1.

2. Coal Mine Subsidence (CMS) Zones: Areas where there is a potential for future trough subsidence or sinkhole development due to collapse of abandoned coal mines as delineated on the Coal Mine Area (CMA) map.

3. Coal Mine Area (CMA) Map: A map (Exhibit A) delineating zones of possible mine subsidence and hazards due to abandoned coal mines based on calculated potential surface strains and tilts, and documented possible coal mine hazards.

4. Coal Mine Waste Dump: Also termed spoil piles, coal mine waste dumps are a loose-dumped mix of soil, rock, coal and any other materials that are produced as a waste product during mining.

5. Development: Any structure, habitable or non-habitable, or other modification of the natural landscape above and below ground or water.

6. Extraction Ratio: Ratio or percentage of extracted coal relative to total coal in a given area of a seam.

7. Gas Emissions: Explosive, poisonous, or suffocating gases emitted from coal seams.

8. Lithology: Type of rock, such as sandstone, siltstone, or shale.

9. Limit Angle: See Angle of Draw.

10. Mine Hazard: Any hazard associated with abandoned coal mines or prospects including but not limited to trough subsidence, coal mine waste dumps, and public safety mine hazards such as sinkholes and shafts.

11. Mine Subsidence: Lowering of the ground surface, with resulting tilts and strains, due to

movement of the underlying soil and/or rock into a void resulting from an underground mine or mine entry.

12. Outcrop: The exposure of bedrock or strata projecting through the overlying soil cover.

13. Panel: The area of a seam from which coal has been systematically extracted.

14. Prospect: An excavation used for exploration or sampling of coal seam.

15. Public Safety Mine Hazards: Mine hazards that may constitute a danger to public safety, including sinkholes, shafts, mine entries, slope entries, gas emissions, mine fires, and others identified as a public safety hazard by the qualified engineer or geologist.

16. Qualified Engineer or Geologist: A Washington State registered geotechnical (civil branch) or mining engineer, or an engineering geologist, who is experienced in evaluation of coal mine subsidence and coal mine hazards, and who is accepted by the City of Bellevue to undertake such evaluations for projects regulated by the City of Bellevue; engineers or geologists without such experience may not be considered to be qualified.

17. Remaining Mine Height: Current true thickness (measured perpendicular to the seam) of cumulative voids in and above mine workings, which corresponds approximately to the original coal seam thickness less the subsidence that has already occurred at depth.

18. Seam: A stratum or bed of coal or other mineral. Individual coal seams in the Coal Creek area are generally identified by name, such as the Primrose, Jones, and Muldoon seams.

19. Shaft: A vertical or inclined tunnel for access to, or ventilation of, mine workings.

20. Sinkhole: A type of subsidence consisting of collapse of the ground surface into an underground void in which the surface expression has a characteristic funnel or shaft shape. Also referred to as a collapse pit. See Figure 2.

21. Slope Entry: Mine entry where the mine access tunnel is inclined to horizontal or sloped.

22. Sphere of Influence: City of Bellevue's potential annexation area based on an agreement among the cities of Bellevue, Renton and Issaquah.

23. Spoil Pile: See Coal Mine Waste Dump.

24. Strain: Change in length per unit length, e.g., a change in length of 0.1 feet over a 100 foot length corresponds to a strain of 0.001.

25. Subcrop: Location of strata such as a coal seam beneath an overlying soil cover.

26. Subsidence Factor: Ratio of maximum surface subsidence to extracted coal seam thickness.

27. Tilt: Differential settlement per unit length, e.g., a tilt of 1 in 500 corresponds to a differential settlement of 0.2 feet over a length of 100 feet.

28. Trough Subsidence (also termed Regional Downwarping): A surface depression caused by mine subsidence that is generally characterized by a gentle and continuous dish shape that extends beyond the vertical projections of the limits of mining within the seam. See Figure 1.

C. Overview of Coal Mine Subsidence (CMS) Zones. The Coal Mine Area (CMA) map delineates areas within the City of Bellevue and associated potential annexation area (sphere of influence) that could be affected by subsidence of abandoned coal mines. The CMA map defines and identifies Coal Mine Subsidence (CMS) Zones based on potential surface tilts and strains and whether there is a potential for sinkhole development.

The CMS zones have been developed based on generalized evaluation of available mine maps and records. Direct subsurface information (boring data) on the condition of the mine workings was not available for development of these zones and regulations except for the Newcastle-King Mine. This Newcastle-King Mine information was used to evaluate potential coal mine impacts associated with the existing plat of The Woods. Alternative interpretations of potential subsidence effects could result from site-specific evaluation and analysis based on detailed review of historic data, direct subsurface information, or alternative assumptions.

A surface reconnaissance report and site-specific evaluations are required prior to permitting subdivision or development on any site in a CMS Zone. Methods of analysis shall be described as appropriate. Construction will be permitted in any CMS Zone after elimination of risk to public safety associated with abandoned coal mines,, and mitigation of coal mine waste dumps (if any) and potential trough subsidence.

1. CMS Zone 1 Strain Exceeds 0.003
   Tilt Exceeds 1:350

   Construction is permitted only after a site-specific evaluation of potential trough subsidence and incorporation of appropriate mitigation measures.

   Site-specific structural and civil design is required in all areas per Sections I & J.

2. CMS Zone 2 Areas directly underlain by coal mine workings at a depth of 200 feet or less, documented prospects and areas within 100 feet of such areas.

   There is a potential for sinkhole development, or for other public safety mine hazards. Construction is permitted only after potential public safety mine hazards are investigated and eliminated. A direct subsurface investigation program is required to investigate potential sink hole development. In addition, if any mine workings could potentially cause trough subsidence at the site, construction is permitted only after a site-specific evaluation of-potential trough subsidence and incorporation of project-specific mitigation measures as required for CMS zone 1.

3. Areas of Potential Undocumented Workings

   CMS Zones are based on an evaluation of documented workings. There is, however, some potential for undocumented workings to exist in the vicinity of outcropping or subcropping seams. The potential for undocumented workings

must be evaluated for any property within 100 feet of the subcrop lines of the Jones and Primrose seams between and beyond known coal mine workings, except for construction of attached additions to, or miscellaneous structures accessory to and within 50 feet of, existing residential buildings. The subcrop lines indicating those areas of potential undocumented workings are shown on the Exhibit B map.

NOTE: The Primrose seam subcrop through the plats of Forest Ridge Estates Divisions I and II, The Woods, and Forest Park No. 4, has not been shown on Exhibit B because geotechnical exploration and abandoned mine hazard assessments were completed and accepted by the City at the time these plats were developed. Therefore, as no undocumented workings were found by those investigations and subsequent development, the Primrose seam subcrop through those plats has not been shown on Exhibit B so that it is clear that future building permit applications for lots in those plats are not subject to these regulations.

4. Changing a CMS Zone Designation

The CMS Zone designation for a property in CMS Zone 1 may be removed if it is demonstrated by site-specific evaluation of trough subsidence that magnitudes of potential surface strains and tilts at the property are less than the levels specified above.

The site-specific evaluation of trough subsidence shall be completed by a Qualified Engineer or Geologist and shall be performed in accordance with the requirements of these regulations. The same or similar assumptions as were used in developing these regulations and the CMA map shall be used when undertaking the site-specific evaluation of trough subsidence. If the evaluation results in a proposed change to the CMS Zone designation based on additional information identified from mine records, or new information available from direct investigation of subsurface conditions by drilling or other means, then the engineer shall be required to demonstrate that the tilts and strains calculated represent the maximum tilts and strains at the site for all possible time sequences of mine collapse.

A CMS Zone 2 designation may be changed to a Zone 1 designation if a direct subsurface investigation demonstrates the absence of coal mine workings or that the coal mine workings, if present, are in a fully collapsed condition.

Any change in a CMS Zone designation must be accepted by the Director of the Department of Community Development or his or her designee.

D. Application/pre-permit Issuance Requirements

1. General Requirements: A surface reconnaissance shall be undertaken for the CMS Zones and for areas of potential undocumented workings. All surface reconnaissance and evaluation of coal mine hazards and potential trough subsidence shall be performed by, or under the direct supervision of, a Qualified Engineer or Geologist.

2. CMS Zone 1: Applicants shall:

a. Conduct a surface reconnaissance and submit at application a report identifying any public safety mine hazards, coal mine waste dumps, or evidence of mine subsidence.

b. If hazards other than trough subsidence are identified in the surface reconnaissance reports, mitigate the hazards after acceptance of an evaluation and remediation plan by the DOD.

c. Conduct a site-specific evaluation of potential trough subsidence.

d. Mitigate for trough subsidence including future surface settlements above collapsed mine workings by developing site-specific design that can accommodate calculated potential subsidence effects.

3. OMS Zone 2: Applicants shall:

a. Conduct a surface reconnaissance and submit at application a report identifying all public safety mine hazards, coal mine waste dumps, and evidence of mine subsidence.

b. Conduct site-specific evaluation of potential for sinkhole development, including subsurface investigation. Test pits may be used to investigate coal mine waste dumps and other shallow hazards such as slope entry portals and shaft collar areas. Drilling is required for coal mine workings or other hazards that cannot be adequately investigated by investigations from surface. Drilling may demonstrate that there is no risk of sinkhole development due to the absence or fully collapsed condition of mine workings. Alternatively, drilling may document sinkhole risks, and the applicant must then design a mitigation program to eliminate all such risks.

c. Eliminate risk of sinkhole development and mitigate other public safety mine hazards and/or coal mine waste dumps after acceptance of an evaluation and remediation plan by the Department of Community Development (DCD).

d. If the site could be subject to trough subsidence due to coal mine workings, conduct a site-specific evaluation of potential trough subsidence.

e. Mitigate for trough subsidence including future surface settlements above collapsed mine workings by developing site-specific design that can accommodate calculated potential subsidence effects as required for CMS zone 1.

4. Areas of Potential Undocumented Workings: If the property lies within 100 feet of a coal seam outcrop or subcrop shown on Exhibit B, but outside any CMS zones, applicants shall (except as exempted under subsection C.3):

a. Conduct a surface reconnaissance and submit at application a report identifying any public safety mine hazards, coal mine waste dumps, or evidence of mine subsidence.

b. If hazards other than trough subsidence are identified in the surface reconnaissance report, mitigate the hazards after acceptance of an evaluation and

remediation plan by the DCD.

5. Requirements for More Than One Zone: If a property lies within more than one CMS Zone and development will include construction of multiple structures, each structure shall be designed to meet the 'regulatory requirements for the zone in which the structure is located. Any structure except roads and utility lines that lies within more than one zone shall be designed in accordance with the requirements for the higher zone number. Roads and utility lines shall be designed in accordance with the requirements for each zone throughout the length of the facility located within that zone.

E. Surface Reconnaissance Reports. A surface reconnaissance shall be undertaken for all CMS Zones and for areas of potential undocumented workings.

The surface reconnaissance shall be undertaken following review of available geologic hazard maps, mine maps, mine hazard maps, and air photographs to identify any subsidence features or mine hazards including but not limited to surface depressions, sinkholes, mine shafts, mine entries, coal mine waste dumps, and any indication of combustion in underground workings or coal mine waste dumps that are present on or within 100 feet of the property. The surface reconnaissance shall include, but not be limited to, inspection, review, and documentation of any known hazards that have previously been documented by the Office of Surface Mining, Abandoned Mined Land program (Smelly and Loy, 1985), or that have been identified from review and interpretation of air photographs or other sources.

The surface reconnaissance report shall include:

1. Historical mining data, including available copies of original mine records for mine workings in coal seams.

2. A map showing property boundaries, CMS Zone boundaries, and any potential hazards identified on or within 100 feet of the property.

3. If hazards are identified; a proposed program of detailed site investigation to support engineering design for remediation.

4. For sites in CMS Zone 2, proposed subsurface investigation program, including exploratory test pit and drill hole locations, and mine plans for all seams that lie within 200 feet of the ground surface.

For sites where trough subsidence must be calculated, the surface reconnaissance report may also include proposed site evaluation and trough subsidence calculation methodology; alternatively, that can be submitted in a separate report.

F. Remediation or Mitigation of Hazards Other Than Trough Subsidence. If hazards are identified in the surface reconnaissance report:

1. Include a separate section in the surface reconnaissance report that proposes a program of detailed site investigation to support engineering for remediation of the hazards.

2. Upon acceptance of the site investigation approach by the DCD, conduct the evaluation.

Submit the results to the DCD along with a proposal for remediation design including the following types of mitigation:

a. Mine Entries and Shafts. Mine entries and shafts shall be permanently sealed using controlled backfill and/or grouting, or an approved, engineered seal. Acceptable seal construction consists of a tapered, reinforced concrete plug constructed within a steel form; a below grade reinforced concrete cap constructed over shaft collars; and a reinforced concrete plug for sealing horizontal mine entries.

   Site preparation prior to installation of the plug shall include permanently diverting surface drainage away from the shaft or mine entry, and excavating loose rock and soil away from the collar of the shaft or the mine entry portal.

   Shaft and slope entry seals shall be designed and installed so that they are bearing on competent bedrock or dense, competent till. The top of the tapered plug or the base of the cap shall extend a minimum of two feet in all directions beyond the shaft or slope entry. The length of any plug used to seal a horizontal mine entry shall not be less than the maximum dimension of the entry. The need for installing additional backfill behind the seal of a horizontal mine entry to prevent potential subsidence over the entry shall be determined on a case by case basis.

b. Existing Sinkholes and Shallow Prospect Excavations. Existing sinkholes and shallow prospect excavations shall be backfilled to surface using controlled placement of suitable backfill. Surface drainage shall be permanently diverted away from existing sinkholes and prospect excavations.

c. Potential Sinkholes. Demonstrate by direct subsurface investigation that coal mine workings either do not exist, or that the workings have fully collapsed so that there is no remaining potential for sinkhole development; or show that the hazards associated with any voids that are identified are fully mitigated by backfilling, grouting, or other approved means such that the potential for sinkhole development is eliminated.

   A fence may be required to be constructed along the CMS Zone 2 boundary, or around known hazards, to prevent access to the area if the potential for sinkhole development has not been eliminated. If a fence is required, signs shall be posted on it, at intervals of no more than 100 feet, warning of danger due to possible sinkholes.

   Any sinkholes that develop shall be promptly backfilled and surface drainage shall be diverted away from the sinkhole.

d. Coal Mine Waste Dumps. Any coal mine waste dump from which springs or seeps are discharging, or which shows evidence of seasonal discharge of springs or seeps, shall be removed or regarded to expose the source of the spring or seep.

   Unless the stability of the coal mine waste dump is verified by a slope stability analysis meeting the requirements of the Minimum Standards for Slope Stability Analysis of the City of Bellevue Development Standards, the coal mine-waste dumps shall be removed from the site, or shall be regarded as necessary such that no slope in the coal waste material exceeds 2(H):1 (V) and meets City of Bellevue stability

criteria.

All coal mine waste material shall be covered with a minimum of two feet of clean soil and shall be revegetated in accordance with the requirements for Vegetative Restoration of the City of Bellevue Development Standards.

No construction shall be permitted over coal mine waste material unless a geotechnical investigation is completed by a soils engineer, and specific design and construction criteria are developed to mitigate the potential impacts of the, coal mine waste on foundation stability and performance. Construction shall not be permitted within 100 feet of any coal mine waste dump that shows evidence of current or past combustion.

e. Mine Gases. Potential hazards associated with mine gases shall be mitigated by backfilling all mine entries, shafts, and sinkholes in accordance with these Regulations.

f. Mine Fires. Construction shall not be permitted over workings where surface or subsurface investigations indicate the possible presence of combustion in the underlying seam or seams.

3. Once the proposed remediation approach is accepted by the DCD, complete the engineering design drawings and specifications for the remediation. Upon acceptance by the DCD, complete the actual remediation.

4. Document the hazard mitigation by submitting as-builds and a remediation construction report. The DCD must agree that hazards have been mitigated before any construction is allowed on the site.

5. Any public safety mine hazards shall be eliminated prior to any other development activities on the site. Hazard mitigation shall be performed by or under the direction of a Qualified Engineer or Geologist. Any hazards found during any development activities shall be immediately reported to the DCD.

6. No construction shall be allowed within 100 feet of an existing public safety mine hazard, regardless of whether the hazard is located on the property for which the permit application is being submitted or not. The decision on whether to permit construction directly over a public safety mine hazard that has been mitigated will be made on a case by case basis based on the type of mitigation and the proposed construction.

G. Site-Specific Evaluation: Potential Trough Subsidence

1. Review of Available Records: The site-specific evaluation of potential trough subsidence shall include a detailed review of available copies of original mine records for mine workings in coal seams that could potentially influence the site by trough subsidence. The locations, depths, and thicknesses of such seams and workings shall be documented. Coal mine workings that could potentially influence the site shall be determined by projecting the downdip limit angle from the lowest limit of the documented workings to the ground surface. Mine workings are considered to potentially influence the property if the property lies within the line at which the limit angle intersects the ground surface.

2. Subsurface Investigations: Subsurface conditions may be evaluated by drilling. Although drilling is not compulsory, it is the most acceptable method for providing information that is acceptable for reducing the Remaining Mine Height value used in subsidence calculations.

   If the applicant wishes to conduct a subsurface investigation, the proposed approach must be submitted to the DCD for review and acceptance.

   Rotary drilling is an acceptable method of drilling provided it is used in combination with downhole geophysical logging, including caliper logs. Core drilling is preferred, but is not compulsory, immediately above and through the predicted coal seam locations to facilitate interpretation of the condition of the mine workings. Rotary drillholes shall be logged continuously from 100 feet above to 20 feet below mine workings, including lithology at 5-foot intervals, drill fluid circulation, penetration rate, and free fall of the drill string. Greater confidence will be placed in core drilling logs than rotary drilling logs.

   As a guideline, it is recommended that a minimum of one drillhole penetrating each coal seam that could potentially cause trough subsidence at the site should be drilled for each 200 foot length of the south property boundary.

   If a drillhole encounters solid or broken coal in an area that available mine maps indicates has been mined out, it shall be assumed that the true thickness of coal represents the thickness of intact or crushed pillars, and corresponds to the Remaining Mine Height for calculating potential trough subsidence affects at surface. If the drillhole encounters voids at or above the location of the coal seam, the cumulative length of the voids shall be used to calculate the true cumulative thickness of the voids, which shall be taken to correspond to the

   Remaining Mine Height. These assumptions can be modified based on additional drilling.

   Direct evidence of the condition of panels in the same seam with similar dimensions, similar extraction ratios, and at a similar or shallower depth, shall be accepted as evidence of the condition of mine workings at any point.

   Surface geophysics, or other indirect means, may be used to assist in projecting information between and beyond drillholes, but shall not be accepted as the sole method for evaluating the condition of underground mine workings and calculating Remaining Mine Height. Assumptions concerning the extent of collapse of mine workings based on recorded extraction ratios shall be conservative because of possible inaccuracies of mine records, the likely presence of remnant pillars and the lack of data to accurately locate them, and because uncollapsed mine workings have been documented under similar conditions in King County.

3. Calculation of Trough Subsidence Magnitudes, Tilts, and Strains: Proposed calculation methods, design parameters, and assumptions that will be used shall be submitted for review and acceptance by the Director of the Department of Community Development or his or her designee prior to calculating trough subsidence.

   The recommended method for calculating potential trough subsidence magnitudes,

strains, and tilts is the empirical function method of the British National Coal Board, as presented in their Subsidence Engineers' Handbook, adjusted to reflect the effects of inclined seams and a downdip limit angle of 45 degrees. Recommended calculation procedures are detailed in subsection K.1 of these regulations.

Calculations shall be based on a conservative evaluation of site conditions developed from the review of available records, site investigation or other acceptable means, such as previous documentation by subsurface exploration of the condition of the coal seam(s) in the immediate vicinity of the site and at an equivalent depth below the ground surface. A subsidence factor of 0.5, a downdip limit angle of 45 degrees, and a value of Remaining Mine Height equal to the seam thickness shall be used for the subsidence calculations unless direct field evidence or a review of detailed mine records is used to modify these values. The effects of individual panel widths and barrier pillar widths shall be considered in the calculation of potential tilts and strains. If direct subsurface investigation indicates that the mine workings are fully collapsed, an estimate of potential surface settlements due to consolidation of rubble and loose material shall be made for sites directly underlain by coal mine workings.

The subsidence analysis shall evaluate the cumulative effect of all seams that could induce trough subsidence at the site.

Alternative methods of calculating potential subsidence magnitudes, strains, and tilts may be used provided they incorporate similar assumptions to those specified in the preceding paragraphs. If alternative design parameters and assumptions are proposed, detailed justification must be provided to the DCD for consideration during their review and acceptance of the proposed calculation approach.

4. Documentation of trough subsidence evaluation: The results of the detailed site evaluation shall be documented. Site plans shall be prepared showing the proposed development and calculated magnitudes of potential subsidence, strains, and tilts at the property boundaries and at the locations of any proposed structures. In addition, a map showing contours of potential subsidence magnitudes, strains, and tilts throughout the property shall be submitted for use in design of roads and utilities.

   Appropriate recommendations shall be provided for structural and civil design requirements outlined in Sections I and J respectively.

H. Site-Specific Evaluation: Potential Sinkhole Development or Other Public Safety Mine Hazards

1. Review of Available Record: To evaluate the potential for sinkholes in CMS Zone 2, the applicant's Qualified Engineer or Geologist shall first conduct a detailed review of available copies of the original mine records for mine workings that could potentially influence the property. Coal mine workings that could potentially influence the site shall be determined by projecting the downdip limit angle from the lowest limit of the documented workings to the ground surface. Mine workings are considered to potentially influence the property if the property lies within the line at which the limit angle intersects the ground surface. The locations, depths, and thicknesses of such seams shall be documented.

2. Proposed Site Investigation: Based on the review of available mine records, the

qualified engineer or geologist shall then propose a site investigation program and submit it for review and acceptance by the DCD as part of the surface reconnaissance report. The proposed program shall include the items and meet the requirements listed below:

a. Drillhole locations. Subsurface conditions for coal seams located within 200 feet of the ground surface shall be investigated by drilling. Drillhole sites shall be selected at representative locations and at representative coal seam depths. Drillholes shall be located adjacent to, but not within, coal pillars that are shown on the mine plans. A minimum of five drillholes shall be drilled along the alignment of any linear structure, such as roads or utility lines designed to cross CMS Zone 2, or within the property boundary for other development of properties of five acres or less. The minimum number of drillholes for properties larger than five acres shall be one hole per acre or as determined by the City.

b. Method of drilling. Rotary drilling is an acceptable method of drilling provided it is used in combination with downhole geophysical logging, including caliper logs. Core drilling is preferred, but is not compulsory, immediately above and through the predicted coal seam locations to facilitate interpretation of the condition of the mine workings. Drillholes shall be logged continuously throughout their length, including lithology at 5-foot intervals for rotary drillholes, drill fluid circulation, penetration rate, and free fall of the drill stung. Greater confidence will be placed in core drilling logs than in rotary drilling logs; this may result in less drillholes being required if core drilling is used in the vicinity of coal seams instead of rotary drilling.

c. Shallow Public Safety Hazards. Shallow hazards such as slope entry portals, shaft collars, prospects and mine waste dumps may be investigated by test pits or trenching, providing the method enables investigation to an adequate depth for the hazard being investigated.

d. Any other site investigation techniques proposed. Indirect means of subsurface evaluation, including geophysics, geologic projection, and evaluation of mining records, may be used to supplement drilling results, but shall not be used as the sole source for evaluating subsurface conditions prior to construction in Zone 2 areas.

3. Investigation Results and Interpretation

Once the City has accepted the proposed site-evaluation, the applicant can proceed to the actual site-investigation and must submit the results and the interpretation of those results to the DCD.

The need for additional drilling shall be determined by the Director of the Department of Community Development or his/her designee based on the results of the initial five drillholes. If a drillhole encounters solid or broken coal in an area that available mine maps indicate has been mined out, it shall be assumed that the true thickness of coal represents the thickness of intact or crushed pillars. If true coal thickness approximately corresponds to the original seam thickness, it shall be assumed that the mine workings have not collapsed. If the drillhole encounters a void at the location of the coal seam, the true length of the void shall be taken to correspond to the Remaining Mine Height for evaluating the potential for sinkhole development. These assumptions can be modified based on additional drilling. If all drillholes verify that mine workings have effectively

collapsed at all depths, further subsurface investigation shall not be required.

I. Mitigation of Trough Subsidence: Buildings in CMS Zone 1.

These mitigation requirements apply to all new construction in CMS zone 1, except as exempted by subsection A.1.

1. GENERAL DESIGN REQUIREMENTS

a. Every building site shall be investigated by a Qualified Engineer or Geologist who shall calculate tilts and strains, and determine appropriate design values for the building site.

b. The foundation elements of each building or structure shall be designed by a Washington State licensed structural engineer, with consideration of the subsidence effects anticipated at the site. The requirements of section I are minimum standards. The structural engineer is responsible to ensure the adequacy of the foundation for the building or structure under consideration. The Building Official may accept alternate designs meeting the intent of these standards. Any portion of the building lateral system not meeting the conventional bracing requirements of the International Building Code, as adopted and amended by the City of Bellevue, must be designed by a structural engineer.

c. Building and structure foundations shall be designed for the loads and conditions specified in subsections 1.2, 1.3, and 1.4 below in conjunction with all applicable loads stipulated in the International Building Code, as adopted and amended by the City of Bellevue. Vertical steps and horizontal offsets of footings and walls must be reinforced to meet the requirements of the International Building Code, as adopted and amended by the City of Bellevue, and the American Concrete Institute, to provide continuity of the reinforcement.

d. The forces generated by subsidence effects of tilt and strain shall be treated as live loads with the appropriate load factors and/or factors of safety in design. The friction drag force loads of subsection 1.2 must be combined simultaneously with the lateral earth pressure loads specified in subsection 1.3, with both loads treated as earth pressure in load combinations. The subsection l.4.a, l.4.b, and l.4.d design requirements may be applied independently of the friction and earth pressure loads.

e. Utility lines shall not be rigidly connected to the foundation wall. A flexible joint shall be provided at the point of transition from soil support to building support for all utilities.

2. DESIGN FOR FRICTION FORCE LOADS

a. CMS Zone 1 includes both tension and compression ground strain zones. Foundations and slabs on grade shall be designed to resist not less than the following ultimate friction forces for tension and/or compression as determined from the geotechnical investigation. Rigid crosstie struts may be used to reduce the span of foundation elements under horizontal load.

$$Fd = f(DL + 0.5\ LL)$$

where, Fd = Drag Force Parallel to Ground Strain Direction

f = Ultimate Coefficient of Friction from Soil to Footing
DL = Design Dead Load
LL = Design Live Load (including snow load)

b. Isolated pad footings and posts shall be designed and constructed to ensure that the post remains plumb. This may be accomplished by reducing the friction under the footing, by rigid bracing of the post in each of four directions, or by other approved means. When post footings are incorporated into rigid crosstie struts, the struts must meet the requirements of subsection l.4.a below.

3. DESIGN FOR LATERAL EARTH PRESSURE LOADS

a. Ultimate passive soil pressure shall be assumed to act on all vertical surfaces in contact with foundation soil due to horizontal strain occurring from a subsidence event. This applies to the horizontal projection of all below grade elements. These ultimate pressures, and the distribution, shall be determined by a Qualified Engineer or Geologist in accordance with established engineering practice. Rigid crosstie struts may be used to reduce the span of foundation elements under horizontal load.

b. Where walls and footings are subject to compression zone forces, these lateral forces may be reduced by the use of compressible backfill material such as wood chips, shredded rubber, or other approved materials. I f such a material is used, it is the responsibility of a Qualified Engineer or Geologist to determine the appropriate design loads to be applied to the structure.

4. DESIGN FOR TILT & CURVATURE CONDITIONS

a. Foundations shall be rigid and shall be designed in accordance with standard engineering practices, but shall be able to resist as a minimum the shears and moments generated by (DL + 0.5 LL) on the support conditions specified in items (1) and (2) below, where L is the total length of the building foundation in the direction under consideration.

(1) An unsupported simple span length of 8 feet or 0.4 L, whichever is less, anywhere within each segment of the foundation in each -direction of the building.

(2) An unsupported cantilever length, fixed at one end and pinned at the other end, of 4 feet or 0.2 L, whichever is less, anywhere within each segment of the foundation in each direction of the building.

b. Rigid foundations longer than 60 feet in severe subsidence conditions (tilts greater than 1 in 200) shall be designed based on an analysis made by a Qualified Engineer or Geologist to account for the specific curvature, but shall meet subsection l.4.a above as a minimum.

c. If rigid materials, such as masonry, veneer or stucco, are used in construction, allowance shall be made at all corners, joints and transitions to other materials for

differential movement and settlement.

d. Stone, brick or masonry arches are not allowed unless the supporting footing is designed per subsection l.4.a above for any downward gravity load directly supported on it and upward full allowable soil bearing pressure, spanning unsupported the entire outer length of the arch.

e. The superstructure shall be bolted to the foundation to resist earth pressure, wind, and seismic forces. Bolts shall have 4 inches of additional thread such that the building can be disconnected, releveled, shimmed and reconnected if so required.

J. Mitigation of Trough Subsidence: ROADS, UTILITIES, GRADING, RETAINING WALLS.

Utilities shall be designed to accommodate the magnitudes of strains and tilts specified in these regulations by using available engineering design techniques, such as those presented by Yokel and others (1981). The following requirements shall apply to CMS Zones 1 and 2.

Structures associated with roads and utilities shall be strong enough to resist the forces induced by maximum predicted subsidence-related tilts and strains, or flexible enough to accommodate the resulting deformations. Where more stringent performance criteria are specified in these regulations, the more stringent criteria apply.

1. Grading: Gradients of landscaped areas shall be designed for the intended drainage under the most critical predicted subsidence conditions. Minimum required slopes needed for positive drainage shall be increased and maximum allowable slopes decreased by amounts equal to the slope of the predicted subsidence profile averaged over a 50 foot length. Gradients away from building foundations shall be not less than 2 percent.

2. Retaining Walls: Concrete or masonry retaining walls, not used as foundation elements for buildings or structures, shall be constructed with expansion joints spaced not greater than 40 feet along the length of the wall and at each corner. The joints shall extend through the wall and footing. Smooth reinforcing dowels may be used for shear connection if one end is greased to prevent bonding of the concrete or grout. Such retaining walls shall be designed to meet the International Building Code, as adopted and amended by the City of Bellevue, other City of Bellevue regulations, and any requirements determined to be appropriate by a Qualified Engineer or Geologist, or a licensed structural engineer.

3. Water: The system design shall be able to provide for twice the maximum predicted tilts and strains, including service lines, structures, and related appurtenances.

4. Sewer: The system design shall be able to provide for 1.5 times the maximum predicted tilts and strains, including service lines, structures, and related appurtenances. Design grades shall provide positive grade after allowing for the maximum predicted subsidence profiles.

5. Storm Drainage: The system design shall be able to provide for 1.5 times the predicted tilts and strains, including service lines, structures, and related appurtenances. Design grades shall provide positive grade after allowing for the maximum predicted subsidence

profile. Detention and retention facilities shall be designed to remain functional following the occurrence of twice the maximum predicted tilts and strains. Such facilities shall only be located in CMS Zone 2 if all risk of sinkhole development has been eliminated. Detention and retention facilities shall be designed and located so that they will not cause damage or a risk to public safety.

6. Roadways and Bridges: All roadways shall be flexible material. Roadways shall have a minimum slope of not less than 1/2 percent plus the slope of the maximum predicted subsidence profile to facilitate maintaining positive drainage. Bridges shall be designed to safely accommodate twice the maximum strains and tilts predicted at the bridge location.

7. Private Utilities: Utility cables and pipelines shall be designed to accommodate the maximum predicted tilts and strains with suitable safety factors applied to these magnitudes. Utilities shall be designed such that failure of the utility line will not present a risk to public safety. The applicant shall present certification from the respective private utility that utilities have been designed in accordance with the above.

K. Background Information. References, and Sources for Site Evaluation The Coal Mine Subsidence Zone Maps have been developed in general by using conservative design criteria for shallow workings and by explicitly considering the condition of the workings in some of the northernmost deeper workings. The Zone 1 boundary is intended to represent the limit of subsidence effects that could potentially occur; the probable magnitudes of future subsidence within Zone 1 may be less or more severe based on site specific analysis. The methods used to develop the maps are described below to facilitate calculation of potential subsidence effects at specific sites.

1. CMS Zone1

Development of the zone boundary for Zone 1 was based on conservative assumptions regarding the existing condition of the documented workings within 700 feet of the ground surface and with explicit consideration of the condition of the workings below approximately 700 feet based on available records of the mining activities in the No. 3, No. 4 and Muldoon seams.

Analyses of the workings above 700 feet and workings below 700 feet not explicitly considered as described above (i.e. No.3, No.4 and Muldoon seams) included the assumption that the coal seams were worked with a high extraction ratio, but have not collapsed so that the Remaining Mine Height is equal to the seam thickness, and that the magnitude of the remaining subsidence (equivalent to the Remaining Mine Height times the subsidence factor) will occur in the future. Individual seam thicknesses are taken from a published survey of abandoned coal mines in the Coal Creek area (Skelly and Loy, 1985). The distribution of coal mine workings has been based primarily on maps prepared for the Office of Surface Mining by Dunrud (1987). These maps are basically skeletal and do not provide complete details of past coal extraction activities. They were spot checked against the most recent submittals of the more detailed mine maps available from the Washington Department of Natural Resources, Division of Geology and Earth Resources.

Analyses of the workings in the No. 3, No. 4 and Muldoon seams below a depth of 700 feet considered the average panel width, the width and location of the barrier pillars, and

the extraction ratio. The likelihood of previous collapse was assumed to have been high where mine records indicated pillars have been recovered, resulting in a high extraction ratio. Previous collapse and high extraction ratios were modeled through a reduced subsidence factor. Extraction ratios were estimated based on detailed mine maps available from the Washington Department of Natural Resources.

Subsidence profiles, tilts, and strains were calculated using the methods detailed in the Subsidence Engineers' Handbook (SEH,1975) with adjustments as noted below. Important assumptions and calculation procedures were as follows:

a. A subsidence factor of 0.5 was used for workings above approximately 700 feet depth and for any deeper workings not explicitly considered as noted above. The subsidence factor is based on site conditions and previous experience under similar conditions. For workings below 700 feet, a maximum subsidence factor of 0.25 was used for workings with extraction ratios of 50 percent. This subsidence factor was reduced using a curve approximating an inverted parabola . For extraction ratios of 90 percent and 10 percent on the parabolic curve, a subsidence factor of 0.1 was used.

b. The maximum vertical subsidence for each seam was calculated as the maximum subsidence that would be predicted for a horizontal seam, multiplied by the cosine of the seam dip (Whittaker, et. al., 1989, Equation 62). Coal seams in the Newcastle area of King County generally dip about 40 degrees.

c. The maximum vertical subsidence for each panel of the workings below 700 feet was corrected for the panel width to depth ratio and for the face length to depth ratio as per Fig. 3 and Fig. 4 of the Subsidence Engineers Handbook (SEH, 1975, pp. 8-11). Barrier pillar widths were estimated from available mine maps.

d. Downdip, centerline, and updip limit angles of 45, 15, and 15 degrees, respectively have been assumed based on data developed by Ren, et. al., as presented by Whittaker (1989, pp. 254-255). These limit angles are considered to be conservative based on lithology, but have been used in the absence of specific site data.

e. Topography is considered in determining the point at which the limit angle intersects the ground surface.

f. Trough subsidence profiles were first calculated for a flat seam, and then adjusted to account for seam inclination by proportioning the subsidence profile for a flat seam between the limit lines at which the limit angles determined for the inclined seams intersect the ground surface.

g. Predicted ground tilts are calculated as the slope between adjacent points of the calculated subsidence profile.

h. Maximum ground strains applicable for horizontal seams were multiplied by Correction factors for inclined seams prior to calculating the strain profile. Correction factors to determine the updip and downdip maximum tensile strain are 0.25 and 1.75 respectively, based on Table 6 of SEH. A correction factor of 1.75 was used to determine the maximum compressive strain (Whittaker, 1989, p. 239). Strain profiles were first calculated for flat seam conditions and then converted to develop inclined

seam strain profiles using the same limit angles used for-the subsidence profiles. Additional correction factors for ground strain calculations considering the panel width to depth ratio (SEH, 1975, Fig. 15, p. 28) have been included in the analysis.

i. The inclined seam subsidence and strain profiles were determined by superimposing the effects of multiple seams across eight cross sections. Subsidence and strain values were calculated at 10 foot intervals along the cross sections.

The interaction of the subsidence effects of multiple seams results in canceling of calculated tilts and strains as, for example, when the zone of compressive strains from the subsidence of one seam corresponds to the zone of tensile strains from the subsidence of an underlying seam. Depending on the assumptions that are made regarding the timing of collapse of coal mine workings, a variety of different strain and tilt values could be calculated at points located within areas potentially influenced by multiple seams.

2. CMS Zone 2

The zone of potential sinkhole development (CMS Zone 2) has been defined as all areas directly underlain by coal mine workings at a depth of 200 feet or less, documented prospects, and the area within 100 feet of such areas. The area within 100 feet of a shaft collar or slope entry is included in CMS Zone 2 even if additional coal mine workings have not been identified in the immediate area. Gangways between documented mine workings that are within 300 feet of the ground surface and are accessed by the same entry as the documented workings are included in CMS Zone 2 because of the possibility of undocumented workings at such locations.

III. References and Sources For Detailed Site Evaluation

The following sources have been used in developing these regulations. Additional information available from these sources could be used in performing detailed site evaluations for specific properties.

Dunrud, Richard, 1987, Mine Map of Newcastle Area, King County, Washington. Prepared for U.S. Department of the Interior, Office of Surface Mining, Denver, Colorado.

National Coal Board, 1975, Subsidence Engineers' Handbook.

Skelly and Loy, 1985, Abandoned Coal Mine Survey, Coal Creek, King County, Washington. Prepared for the U.S. Department of the Interior, Office of Surface Mining, Denver, Colorado.

Washington Department of Natural Resources, Division of Geology and Earth Resources. Available copies of original mine maps for the No. 3, No. 4 and Muldoon seams.

Whittaker, Barry N., and David J. Reddish, 1989, Subsidence, Occurrence, Prediction, and Control. Developments in Geotechnical Engineering, 56, published by Elsevier.

Yokel, F. Y., L. A. Salomone, and R. M. Chung, 1981, Construction of Housing in Mine Subsidence Areas. NBSIR 81-2215.

20.25H.135 Mitigation and Monitoring – Additional Provisions for All Geologic Hazard Critical Areas. In addition to the general mitigation and restoration plan requirements of LUC 20.25H.210, each mitigation or restoration plan for geologic hazard critical areas shall include:

A. Erosion and Sediment Control Plan. The erosion and sediment control plan shall be prepared in compliance with requirements set forth in BCC Ch. 23.76, now or as hereafter amended. Such plans shall also include, if not otherwise addressed in BCC Ch. 23.76, the location and methods of drainage, surface water management, locations and methods of erosion control, a vegetation management and/or replanting plan, and/or other means for maintaining long-term soil stability;

B. **Drainage Plan.** The technical information shall include a drainage plan for the collection, transport, treatment, discharge, and/or recycle of water prepared in accordance with applicable city codes and standards. The drainage plan should consider on-site septic system disposal volumes where the additional volume will affect the erosion or landslide hazard area;

C. Monitoring Surface Waters. If the director determines that there is a significant risk of damage to downstream receiving waters due to potential erosion from the site, based on the size of the project, the proximity to the receiving waters, or the sensitivity of the receiving waters, the technical information shall include a plan to monitor the surface water discharge from the site.

20.25H.140 Critical Areas Report – Additional Provisions for All Geologic Hazard Critical Areas.

In addition to the provisions of LUC 20.25H.230, any proposal to modify a geologic hazard critical area or critical area buffer through a critical areas report shall comply with the requirements of this section.

A. Limitation on Modification.

1. Removal from protected status. An area otherwise designated as a landslide hazard area or a steep slope may be removed from critical area status and from regulation under this Part 20.25H only if all the following apply:

    a. The slope does not exceed 20 feet in rise;

    b. The applicant provides a geotechnical report prepared by a qualified professional demonstrating that modification of the slope will have no adverse impacts on stability of any adjacent slopes, and will not impact stability of any existing structures;

    c. Any slope modification complies with recommendations of the geotechnical support with respect to best management practices, construction techniques or other recommendations; and

    d. The slope does not provide wildlife habitat, and could not reasonably be expected to provide wildlife habitat if regulated under this Part 20.25H for some period of time.

2. Habitat of a species of local importance. The critical area buffer for a geologic hazard critical area providing habitat for a species of local importance shall not be less than 25 feet.

3. Coal Mine Hazards. The requirements of LUC 20.25H.130 may not be modified through a critical areas report.

B. **Area Addressed in Critical Area Report**. In addition to the general requirements of LUC 20.25H.230, the following areas shall be addressed in a critical area report for geologically hazardous areas:

1. **Site and Construction Plans.** The report shall include a copy of the site plans for the proposal showing and a topographic survey;

2. **Assessment of Geological Characteristics.** The report shall include an assessment of the geologic characteristics of the soils, sediments, and/or rock of the project area and potentially affected adjacent properties, and a review of the site history regarding landslides, erosion, and prior grading. Soils analysis shall be accomplished in accordance with accepted classification systems in use in the region;

3. **Analysis of Proposal.** The report shall contain a hazards analysis including a detailed description of the project, its relationship to the geologic hazard(s), and its potential impact upon the hazard area, the subject property, and affected adjacent properties; and

4. **Minimum Critical Area Buffer and Building Setback.** The report shall make a recommendation for a minimum geologic hazard critical area buffer , if any, and minimum building setback, if any, from any geologic hazard based upon the geotechnical analysis.

20.25H.145 Critical Areas Report – Approval of Modification

Modifications to geologic hazard critical areas and critical area buffers shall only be approved if the director determines that the modification:

A. Will not increase the threat of the geological hazard to adjacent properties over conditions that would exist if the provisions of 20.25H were not modified;

B. Will not adversely impact other critical areas;

C. Are designed so that the hazard to the project is eliminated or mitigated to a level equal to or less than would exist if the provisions of 20.25H were not modified; and

D. Are certified as safe as designed and under anticipated conditions by a qualified engineer or geologist, licensed in the state of Washington.

VIII HABITAT ASSOCIATED WITH SPECIES OF LOCAL IMPORTANCE

20.25H.150 Designation of Critical Area.

A. Definition of a Species of Local Importance. The following species are hereby designated as species of local importance:

1. Bald Eagle (*Haliaeetus leucocephalus*)
2. Peregrine falcon (*Falco peregrinus*)
3. Common loon (*Gavia immer*)
4. Pileated woodpecker (*Dryocopus pileatus*)
5. Vaux's swift (*Chaetura vauxi*)
6. Merlin (*Falco columbarius*)
7. Purple martin (*Progne subis*)
8. Western grebe (*Aechmophorus occidentalis*)
9. Great blue heron (*Ardea herodias*)
10. Osprey (*Pandion haliaetus*)
11. Green heron (*Butorides striatus*)
12. Red-tailed hawk (*Buteo jamaicensis*)
13. Western big-eared bat (*Plecotus townsendii*)
14. Keen's myotis (*Myotis keenii*)
15. Long-legged myotis (*Myotis volans*)
16. Long-eared myotis (*Myotis evotis*)
17. Oregon spotted frog (*Rana pretiosa*)
18. Western toad (*Bufo boreas*)
19. Western pond turtle (*Clemmys marmorata*)
20. Chinook salmon (*Oncorhynchus tshawytscha*)
21. Bull trout (*Salvelinus confluentus*)
22. Coho salmon (*Oncorhynchus kisutch*)
23. River lamprey (*Lampetra ayresi*)

B. Habitat (other than the critical areas and critical areas buffers otherwise designated in LUC 20.25H.025) for a species of local importance is hereby designated a critical area; provided, that compliance with these species of local importance regulations, LUC 20.25H.150 through LUC 20.25H.170 inclusive, shall constitute compliance with the requirements of this Part in regard to habitat for species of local importance.

C. Naturally occurring ponds of under 20 acres (see LUC 20.50.036) are hereby designated critical areas.

20.25H.155 Uses in Habitat for Species of Local Importance.

The uses allowed in the underlying land use district are allowed within habitat for species of local importance, so long as the development complies with the performance standards of LUC 20.25H.160. The section does not allow modification of other critical areas or critical area buffers.

20.25H.160 Performance Standards

If habitat for species of local importance will be impacted by a proposal, the proposal shall implement the wildlife management plan developed by the Department of Fish & Wildlife for such species. Where the habitat does not include any other critical area or critical area buffer, compliance with the wildlife management plan shall constitute compliance with this Part 20.25H.

20.25H.165 Critical Area Report – Additional Provisions. In addition to the general critical area report requirements of LUC 20.25H.230, critical area reports to modify the performance standards for habitat for species of local importance must meet the requirements of this Section.

A. Habitat Assessment. A habitat assessment is an investigation of the site to evaluate the potential presence or absence of designated species of local importance or habitat for species of local importance. A critical area report for habitat for species of local importance shall contain an assessment of habitats including the following site- and proposal-related information at a minimum:

1. Detailed description of vegetation on and adjacent to the site;

2. Identification of any species of local importance that have a primary association with habitat on or adjacent to the site, and assessment of potential project impacts to the use of the site by the species;

3. A discussion of any federal, state, or local special management recommendations, including Washington Department of Fish and Wildlife habitat management recommendations, that have been developed for species or habitats located on or adjacent to the site;

4. A detailed discussion of the direct and indirect potential impacts on habitat by the project, including potential impacts to water quality;

5. A discussion of measures, including avoidance, minimization, and mitigation, proposed to preserve existing habitats and restore any habitat that was degraded prior to the current proposed use or activity and to be conducted in accordance with the mitigation sequence set forth in LUC 20.25H.215; and

6. A discussion of ongoing management practices that will protect habitat after the site has been developed, including proposed monitoring and maintenance programs.

20.25H.170 Process to Identify Additional Species of Local Importance

A. Designation Process. Additional species of local importance may be designated pursuant to the Land Use Code Amendment process, LUC 20.30J.

B. **Additional Decision Criteria.** In addition to the decision criteria of LUC 20.30J.135, a species may be designated a species of local importance only if it demonstrates the following characteristics:

1. Local populations of native species are in danger of extirpation based on existing trends:

Local populations of native species that are likely to become endangered; or
Local populations of native species that are vulnerable or declining;

2 The species or habitat has recreation, commercial, game, tribal, or other special value;

3 Long-term persistence of a species is dependent on the protection of the species through the provisions of this Part 20.25H;

4 Protection by other county, state, or federal policies, laws, regulations, or nonregulatory tools is not adequate to prevent degradation of the species or habitat in the city; and

5 Without protection, there is a likelihood that the species or habitat will be diminished over the long term.

C. Effect of Designation. Designation of a species of local importance under this section shall not impact projects or proposals with a vested application or approved permit.

IX. AREAS OF SPECIAL FLOOD HAZARD

20.25H.175 Designation of Critical Area.

A. Designation of Critical Area- Areas of Special Flood Hazard shall include:

1. **Base Flood Elevation (BFE)** The land in the flood plain subject to the flood having a one percent chance of being equaled or exceeded in any given year as determined by customary methods of statistical analyses defined in the Utility Code, Chapter 24.06 BCC. Also referred to as the One Hundred-Year Flood.

2. **Areas Identified on the Flood Insurance Map(s).** Those areas of special flood hazard identified by the Federal Insurance Administration in a scientific and engineering report entitled *The Flood Insurance Study for Bellevue dated* December, 1978, with an accompanying flood insurance map(s) and any revisions thereto. The Flood Insurance Study and accompanying map(s) are hereby adopted by reference, declared part of this Chapter, and are available for public review at the City of Bellevue.

3. **Designation Made by Director**. Flood Insurance Rate Maps are to be used as a guide for the City of Bellevue, project applicants, and/or property owners to identify Flood Hazard Areas. Flood Insurance Rate Maps may be continuously updated as areas are reexamined or new areas are identified, newer and more restrictive information for flood hazard area identification shall be the basis for regulation.

4. **Use of Additional Information**. The Director may use additional flood information that is more restrictive or detailed than that provided in the Flood Insurance Study conducted by the Federal Emergency Management Agency (FEMA) to designate frequently flooded areas, including data on channel migration, historical data, high water marks, photographs of past flooding, location of restrictive floodways, maps showing future build-out conditions, maps that show riparian habitat areas, or similar information.

5. **Flood Elevation Data.** When Base Flood Elevation data is not available (A and V zones), the director shall obtain, review, and reasonably utilize any base flood elevation and floodway data available from a federal, state, or other source, in order to administer this Chapter. In Flood Hazard Areas where the BFE has increased due to remapping efforts, the new BFE will establish the regulatory limit.

20.25H.180 Development in the Area of Special Flood Hazard.

No use, development or activity may occur in an Area of Special Flood Hazard except as specifically allowed by this Part 20.25H. All use, development or activity which is allowed is subject to the performance standards of this subsection and shall not result in a rise in the BFE.

A. General. Any structure may intrude over the Area of Special Flood Hazard if:

1. The intrusion is located above existing grade, and does not alter the configuration of the Area of Special Flood Hazard; and

2. The intrusion is at an elevation and orientation which maintains the existing vegetation of the Area of Special Flood Hazard in a healthy condition. Solar access to vegetation must be maintained at least 50 percent of daylight hours during the normal growing season.

B. Development not meeting requirements. Development not meeting the requirements of subsection A above may be allowed only in accordance with the requirements set forth in this section.

C. Existing Development Declared Legally Nonconforming. All development within the Area of Special Flood Hazard, LUC 20.50.010, for which a vested Building Permit application exists prior to the effective date of this Part 20.25H and which fails to comply with the requirements of this Part 20.25H is legal nonconforming development. Any change to a legal nonconforming development is subject to the performance standards of this section only if new development or substantial improvement is proposed. Substantial Improvement includes the following: Any repair, reconstruction, or improvement of a structure, the cost of which equals or exceeds 50 percent of the replacement value of the structure either, (1) before the improvement or repair is started, or (2) if the structure has been damaged, and is being restored, before the damage occurred. For the purpose of this definition, “substantial improvement” is considered to occur when the first alteration of any wall, ceiling, floor or other structural part of the building commences whether or not that alteration affects the external dimensions of the structure. The term does not, however, include either (1) any project for improvement of a structure to comply with existing state or local health, sanitary, or safety code specifications which are solely necessary to assure safe living conditions or (2) any alteration of a structure listed on the National Register of Historic Places.

D. Review of Proposed Development – Applicable Process.

Proposals for development in the Areas of Special Flood Hazard shall require a critical areas land use permit, Part 20.30P. The Director shall determine that all necessary permits have been obtained from federal, state, or local agencies prior to approval.

E. General Performance Standards. Where use or development is allowed pursuant to subsection F below, the following performance standards apply.

1. Elevation Certificate Following Construction. Following construction of a structure within the Flood Hazard Area, where the Base Flood Elevation is provided, the applicant shall obtain an elevation certificate. The elevation certificate shall be completed by a surveyor or engineer licensed in the state of Washington and shall be submitted to City of Bellevue, Utilities Department. The Director of Planning and Community Development shall obtain and transmit to the Director of the Utilities Department the elevation in relation to City of Bellevue vertical datum (NAVD 88) the lowest floor, including basement, and attendant utilities of a new or substantially improved structure permitted by this part.

2. Construction Materials and Methods

a. Structures shall be located outside the flood hazard area. All structures, utilities, and other improvements shall be located on the buildable portion of the site out of the flood hazard area unless there is no buildable site out of the flood hazard area. For sites with no buildable area out of the flood hazard area, structures, utilities, and other improvements shall be placed on the highest land on the site, oriented parallel to flow rather than perpendicular, and sited as far from the watercourse and other critical areas as possible. Located in flood-fringe where flood flow velocities are less than 3 feet per second and flood depths are less than 3-feet. If the [director] detects any evidence of active hyporheic exchange on a site, the development shall be located to minimize disruption of such exchange.

b. Methods That Minimize Flood Damage. Post and piling techniques are preferred and are presumed to produce no increase in the Base Flood Elevation. All new construction and substantial improvements shall be constructed using flood resistant materials and using methods and practices that minimize flood damage.

c. Utility Protection. Electrical, heating, ventilation, plumbing, air-conditioning equipment, and other service facilities shall be designed and/or otherwise elevated or located so as to prevent water from entering or accumulating within the components during conditions of flooding.

d. Anchoring. All new construction and substantial improvements shall be anchored to prevent flotation, collapse, or lateral movement of the structure. (44 CFR 60.3(a)(3)(i))

3. No rise in the Base Flood Elevation (BFE). All new structures and expansions of existing structures located in the flood hazard area as permitted below shall not result in a rise in the BFE. Demonstration of no net rise shall be calculated by methods established in the Utilities Engineering Standards, Section D4-04.5, Flood Plain/Floodway Analysis.

4. **Alteration of Watercourses**. Alteration of natural watercourses shall be avoided, if feasible. If unavoidable, the following provisions shall apply to the alteration:

    a. Watercourse alterations shall only be allowed in accordance with the habitat improvement projects.

    b. Watercourse alteration projects shall not result in blockage of side channels.

    c. The City of Bellevue shall notify adjacent communities, the state departments of Ecology and Fish and Wildlife, and the Federal Insurance Administration about the proposed watercourse alteration at least thirty (30) days prior to permit issuance.

    d. The applicant shall maintain the altered or relocated portion of the watercourse to ensure that the flood carrying capacity is not diminished. Maintenance shall be bonded for a period of five years, and be in accordance with an approved maintenance program.

5. **Compensatory Storage**. Compensatory storage is allowed only for projects receiving a reasonable use exception under LUC 20.25H.190 and where no technically feasible alternative with less impact on the critical area exists. Development proposals must not reduce the effective base flood storage volume of the flood hazard area. Grading or other activity that would reduce the effective storage volume must be mitigated by creating compensatory storage on the site. The compensatory storage must:

    a. provide equivalent elevations to that being displaced;

    b. be hydraulically connected to the source of flooding;

    c. be provided in the same construction season and before the flood season begins on September 30;

    d. occur on site or off site if legal arrangements can be made to assure that the effective compensatory storage volume will be preserved over time;

    e. be supported by a detailed hydraulic analysis that:

        i. is prepared by a licensed engineer

        ii. demonstrates that the proposed compensatory storage does not adversely affect the BFE; and

    f. meet all other critical areas rules subject to this part 20.25H.

F. Allowed Uses and Activities -- Specific Performance Standards.

1. Allowed Uses and Activities. The following allowed uses and activities may be undertaken in the Areas of Special Flood Hazard, pursuant to the criteria of LUC 20.25H.060.

    a. Repair and maintenance of existing parks
    b. Repair and maintenance of public and private roads.

c. Agricultural uses
d. Repair and maintenance of existing utility facilities and systems

2. Existing Nonconforming Development.

a. Substantial Improvements. Substantial improvement of any residential structure shall have the lowest floor, including basement, elevated one foot or more above the base flood elevation (BFE). Fully enclosed areas below the lowest floor that are subject to flooding are prohibited, or shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect or must meet or exceed the following minimum criteria:

i. A minimum of two (2) openings having a total net area of not less than one (1) square inch for every one (1) square foot of enclosed area subject to flooding shall be provided.

Ii The bottom of all openings shall be no higher than one (1) foot above grade.

iii. Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

iv. Enclosed areas (including breakaway walls) below the BFE shall:

(A) be no larger than 300 square feet,

(B) meet all requirements for anchoring, openings, and flood resistant materials.

b. Lateral Additions. Lateral additions to structures that qualify as a substantial improvement must meet the elevation standards of new construction. If the common wall between the lateral addition and the existing structure is demolished as part of the project, then the entire structure must meet the elevation standards of new construction. If only a doorway or similar is knocked through, only the addition has to meet the elevation standards.

c. Pre-FIRM Buildings. Pre-FIRM buildings that qualify as a substantial improvement (including lateral additions) must meet the elevation standards of new construction.

3. New Uses and Activities. The following new uses and activities may be allowed in the Areas of Special Flood Hazard, pursuant to the criteria of LUC 20.25H.070.

a. Emergency Actions

b. Plat and Short Plat Proposals

i. All lots created through subdivision or short subdivision shall have adequate building space outside the 100-year floodplain, the floodway, and the channel migration zone. All subdivisions and short subdivisions shall:

ii. Subdivisions and short subdivisions shall be designed to minimize or eliminate flood damage and impacts to floodplain functions and values. Public utilities and facilities that are installed as part of such subdivisions, such as sewer, gas, electrical, and water systems, shall be located and constructed to also minimize flood damage and impacts to floodplain functions and values. Subdivisions should be designed using natural features of the landscape and should not incorporate flood protection changes.

iii. Subdivisions and short subdivisions shall have adequate natural surface water drainage in accordance with [locally adopted surface water management requirements] to reduce exposure to flood hazards; and

iv. Subdivisions and short subdivisions shall show the 100-year floodplain, floodway, and channel migration zone on the preliminary and final plat and short plat maps and designate such areas as “no build,” when applicable.

v. Where detailed base flood elevation data has not been provided or is not available from another authoritative source, it shall be generated for subdivision proposals and other proposed developments which contain at least fifty (50) lots or five (5) acres, whichever is less.

c. New or Expanded Essential Public Facilities

i. The facility is elevated or protected to the 500-year flood elevation.

ii. Dry flood proofing and sealing measures must be taken to ensure that hazardous or toxic substances will not be displaced by or released into floodwaters.

d. New or Expanded Public Rights of Way.

i. The low chord on the bridge structure will be no less than the elevation of the BFE

ii. Access to Essential Public Facilities must be elevated to or above the BFE to the nearest maintained public street or roadway.

e. Recreational Vehicles. Recreational vehicles are required to either:

i. Be on the site for fewer than one hundred eighty (180) consecutive days;

ii. Be fully licensed and ready for highway use on its wheels or jacking system, be attached to the site only by quick disconnect type utilities and security devices, and have no permanently attached additions; or

iii. Obtain a development permit and meet the requirements, including elevation and anchoring, for manufactured homes.

f. Storm Water Facilities

g. New and Expanded City and Public Parks and other Public Access

h. Public Flood Protection Structures.

i. Habitat Improvement Projects

j. Moorage. See LUC 20.25E.080.N

k. Shoreline stabilization. See LUC 20.25E.080.E.

4. Reasonable Use Exception. Where a reasonable use exception is granted under LUC 20.25H.190, the following performance standards apply:

a. Residential Construction (single-family and multi-family dwellings).

i. Must be Above Base Flood Elevation. New construction of any residential structure shall have the lowest floor, including basement and attendant utilities, elevated one (1) foot or more above the Base Flood Elevation.

ii. Enclosed areas (including breakaway walls) below the BFE shall:

(A) be no larger than 300 square feet,

(B) meet all requirements for anchoring, openings, and flood resistant materials.

b. Manufactured Homes. All manufactured homes must meet the elevation standards for new construction. All manufactured homes shall be anchored to prevent flotation, collapse, or lateral movement, and shall be installed using methods and practices that minimize flood damage. Anchoring methods may include, but are not limited to, use of over-the-top or frame ties to ground anchors. *(44 CFR 60.3(b)(8)).*

c. Nonresidential Construction.

i. New construction and substantial improvement of any commercial, industrial, or other nonresidential structure shall either have the lowest floor, including basement, elevated one foot (1) or more above the Base Flood Elevation, or,

ii. together with attendant utility and sanitary facilities, shall:

(A) Be floodproofed so that below one (1) foot or more above the Base Flood Elevation the structure is watertight with walls substantially impermeable to the passage of water;

(B) Have structural components capable of resisting hydrostatic and hydrodynamic loads and effects of buoyancy; and

(C) Be certified by a registered professional engineer or architect that the design and methods of construction are in accordance with accepted standards of practice for meeting provisions of this Subsection based on their development and/or review of the structural design, specifications, and plans. Such certification shall be provided to the Department of Planning and Community Development. Following construction of the structure, Elevation Certificates shall be submitted to the city that record the actual (as-built) elevation to which the structure was floodproofed.

iii. Fully enclosed areas below the lowest floor that are not floodproofed shall be designed to automatically equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters. Designs for meeting this requirement must either be certified by a registered professional engineer or architect, or must meet or exceed the following minimum criteria:

(A) A minimum of two (2) openings having a total net area of not less than one (1) 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 (1) foot above grade; and

(C) Openings may be equipped with screens, louvers, or other coverings or devices provided that they permit the automatic entry and exit of floodwaters.

iv. Lateral Additions**.** Lateral additions to structures that qualify as a substantial improvement must meet the elevation standards of new non-residential construction. If the common wall between the lateral addition and the existing structure is demolished as part of the project, then the entire structure must meet the standards of new, non-residential construction. If only a doorway or similar is knocked through, only the addition has to meet the construction standards.

v. Pre-FIRM Buildings**.** Pre-FIRM buildings that qualify as a substantial improvement (including lateral additions) must meet the elevation standards of new construction.

20.25H.185 Definitions. The following definitions apply to the Area of Special Flood Hazard regulated under this Part 20.25H.

Basement. Means any area of the building having its floor subgrade (below ground level) on all sides.

Base Flood Elevation (BFE). The flood having a one percent chance of being equaled or exceeded in any given year as determined by customary methods of statistical analyses defined in the Utility Code, Chapter 24.06 BCC. Also referred to as the One Hundred-Year Flood.

Flood or Flooding. A general and temporary condition of partial or complete inundation of normally dry land areas from:

i. The overflow of inland or tidal waters; or

ii. The unusual and rapid accumulation or runoff of surface waters from any source.

Flood Insurance Rate Map. The map delineating special flood hazard areas effective December, 1978, that was prepared by the Federal Insurance Administration for the City or as subsequently revised by the Federal Emergency Management Agency.

Floodproofing. Any combination of structural and nonstructural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents.

Hyporheic zone The saturated zone located beneath and adjacent to streams that contains some portion of surface waters, serves as a filter for nutrients and maintains water quality.

Lowest Floor. Means the lowest floor of the lowest enclosed area (including basement). An unfinished or flood resistant enclosrue, usable solely for parking vehicles, building access or storage, in an area other than a basement area, is not considered a building lowest floor, provided that such enclosure is not built so as to render the structure in violation of the applicable non-elevation design requirements of this ordinance found in section …

Manufactured Home. Means a structure, transportable in one or more sections, which is built on a permanent chassis and is designed for use with or without a permanent foundation when attached to the required utilites. The term "manufactured home" does not include "recreational vehicle."

One Hundred Year Flood. See "Base Flood Elevation."

Pre-FIRM Buildings. A building constructed prior to ***.

Recreation Vehicle. Means a vehicle which is:

(a) Built on a single chassis;

(b) 400 square feet or less when measured at the largest horizontal projection;

(c) Designed to be self-propelled or permanently towable by a light duty truck; and

(d) Designed primarily not for use as a permanent dwelling but as a temporary living quarters for recreational, camping, travel, or seasonal use.

Structure. A walled and roofed building, including a gas or liquid storage tank, that is principally above ground, as well as a mobile home.

X. REASONABLE USE EXCEPTION

20.25H.190 Reasonable Use Exception – Purpose.

The reasonable use exception is a mechanism by which the City may approve limited use and disturbance of a critical area and critical area buffer when no other use of the property constitutes a reasonable alternative.

20.25H.195 Reasonable Use Exception – Process.

A request for a reasonable use exception shall be processed as a critical areas land use permit, Part 20.30P.

20.25H.200 Reasonable Use Exception – Applicability.

A. When allowed. A reasonable use exception may be granted when no other reasonable use of property exists by the application of the regulations of this Part 20.25H. Reasonable use is defined for each land use district and site as follows:

1. Single family land use districts – Large lots.

   a. Large lot defined. A large lot is any lot that earns more than one unit of density under the density/intensity calculation set forth in LUC 20.25H.045.

   b. Reasonable use for large lots. A large lot will be considered to have no reasonable uses under the regulations of this Part 20.25H where no more than one buildable lot can be created through the subdivision process, Part 20.45A, or the short subdivision process, Part 20.45B after maximizing the dimensional modifications allowed in LUC 20.25H.040. In such cases, the director may allow disturbance within a critical area and critical area buffer as follows:

      i. Up to 10 percent of the total site area may be disturbed for development, including all structures, grading, utility installation, landscaping and other necessary land alteration. The director may allow more than 10 percent of the total site area to be disturbed where required to allow the creation of two units meeting the requirements of this subsection A.1;
      ii. Density shall not exceed the density allowed under LUC 20.25H.045, and shall not be less than two units;
      iii. Where more than one unit is created, the applicant shall also follow the processes of subdivision (Part 20.45A), short subdivision (Part 20.45B), or Planned Unit Development (Part 20.30D), including applicable decision criteria except as modified in this section; and
      iv. Through this reasonable use exception, minimum lot size and other dimensional requirements may be modified as necessary to accommodate the allowed reasonable development, provided that the resulting development is compatible with other development or potential development in the immediate vicinity of the subject property in the same zone and with similar site constraints.

   c. Performance standards. Where disturbance of a critical area or critical area buffer is allowed under this section, development is subject to the performance standards of LUC 20.25H.205 below.

2. Single family land use districts – small lots.

   a. Small lot defined. A small lot is any lot that does not earn more than one unit under the density/intensity calculation of LUC 20.25H.045.

   b. Reasonable use for small lots. A small lot will be considered to have no reasonable uses under the regulations of this Part 20.25H where the area available for disturbance is less than the amount set forth in the table in subsection b.i below. For purposes of this section, the area available for disturbance is that consolidated area of the site outside of the critical area and critical area buffer, and outside of the required setbacks, modified to the maximum extent allowed under LUC 20.25H.040. In such cases, the director may allow disturbance within a critical area and critical area buffer as allowed in this subsection A.2.

      i. Minimum reasonable disturbance area:

Land Use District	**R-1**	**R-1.8**	**R-2.5**	**R-3.5**	**R-4**	**R-5**	**R-7.5***
Buildable Area (in square	3000	3000	3000	2625	2231	2160	1410

feet)							

**Not effective within the jurisdiction of the East Bellevue Community Council*

ii. Where the area available for disturbance is less than described above, the director may allow disturbance in a critical area and critical area buffer to the extent required to create a consolidated area for disturbance equal to the amounts set forth in subsection b.i above.
iii. Disturbance includes all development, including all structures, grading, utility installation, landscaping and other necessary land alteration.

c. Performance standards. Where disturbance of a critical area or critical area buffer is allowed under this section, development is subject to the performance standards of LUC 20.25H.205 below.

3. Multi-family land use districts.

a. Reasonable use. The reasonable use process applies to lots that are more than 90 percent constrained by critical area and critical area buffer. In such cases, the director may allow disturbance within a critical area and critical area buffer as follows:

i. Up to 10 percent of the total site area may be disturbed for development, including all structures, grading, utility installation, landscaping and other necessary land alteration; and
ii. Density shall not exceed the density allowed under LUC 20.25H.045.

b. Performance standards. Where disturbance of a critical area or critical area buffer is allowed under this section, development is subject to the performance standards of LUC 20.25H.205 below.

4. All other land use districts.

a. Reasonable use. The reasonable use process applies to lots that are more than 90 percent constrained by critical area and critical area buffer. In such cases, the director may allow disturbance within a critical area and critical area buffer as follows:

i. Up to 10 percent of the total site area may be disturbed for development, including all structures, grading, utility installation, landscaping and other necessary land alteration; and
ii. Density shall not exceed the density allowed under LUC 20.25H.045.

20.25H.205 Reasonable Use Exception – Performance Standards.

Where disturbance of a critical area or critical area buffer is allowed under this section, development is subject to the following performance standards. Additional performance standards apply to development in stream corridors (LUC 20.25H.080), wetlands (LUC 20.25H.100), geologic hazard areas (LUC 20.25H.125), and areas of special flood hazard (LUC 20.25H.180). Where a conflict exists with the performance standards of this section, the provisions providing the most protection to critical area functions and values apply.

A. The structure shall be located on the site in order to minimize the impact on the critical area or critical area buffer, including modifying the non-critical area setbacks to the maximum extent allowed under LUC 20.25H.040;

B. Ground floor access points at the rear and sides of the structure shall be limited to the minimum necessary to comply with the requirements of the International Building Code and International Fire Code, as adopted and amended by the City of Bellevue when the structure is located within a critical area or critical area buffer;

C. Associated development, including access driveways and utility infrastructure shall be located outside of the critical area or critical area buffer to the maximum extent technically feasible;

D. Areas of disturbance for associated development, including access and utility infrastructure shall be consolidated to the maximum extent technically feasible;

E. All areas of temporary disturbance limits shall be delineated in the field prior to construction and temporary disturbance shall be restored pursuant to a restoration plan meeting the requirements of LUC 20.25H.210;

F. Areas of permanent disturbance shall be mitigated to the maximum extent feasible on-site pursuant to a mitigation plan meeting the requirements of LUC 20.25H.210; and

G. Fencing, signage and/or additional buffer plantings should be incorporated into the site development in order to prevent long-term disturbance within the critical area or critical area buffer.

XI. GENERAL MITIGATION AND RESTORATION REQUIREMENTS

20.25H.210 Applicability.

Where a mitigation or restoration plan is required for an activity in a critical area or critical area buffer, the plan shall be developed in accordance with the standards of these sections 20.25H.210 through 20.25H.225 inclusive. Any mitigation or restoration plan shall be approved as part of the permit or approval required for the underlying activity.

20.25H.215 Mitigation Sequencing. Applicants shall demonstrate that all reasonable efforts have been examined with the intent to avoid and minimize impacts to the critical area and/or critical area buffer. When an alteration to a critical area is proposed, such alteration shall be avoided, minimized, or compensated for in the following order of preference:

A. Avoiding the impact altogether by not taking a certain action or parts of an action;

B. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps, such as project redesign, relocation, or timing, to avoid or reduce impacts;

C. Performing the following types of mitigation (listed in order of preference):

1. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;

2. Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or

3. Compensating for the impact by replacing, enhancing, or providing substitute resources or environments;

D. Monitoring the hazard or other required mitigation and taking remedial action when necessary.

Mitigation for individual actions may include a combination of the above measures.

20.25H.220 Mitigation and Restoration Plan Requirements. When mitigation and/or restoration is required, the applicant shall submit a mitigation or restoration plan for approval as part of the review of the underlying proposal.

A. Plan Phases. Where an applicant is seeking modifications to the requirements of this chapter through a Critical Areas Report pursuant to LUC 20.25H.230, the mitigation plan required for the proposal may be submitted in phases, when allowed by the Director.

B. Restoration and Mitigation Project Details. The plan shall be prepared by a qualified professional and shall at minimum include the content identified in this section. Additional requirements may be found for specific critical areas in subsections 20.25H.085 (stream corridors); 20.25H.105 (wetlands); 20.25H.135 (geologic hazard areas). Details about the contents of restoration and mitigation plans will be developed by the director in submittal requirements. The director may waive any of the plan requirements, where, in the director's discretion, the information is not necessary to develop a mitigation or restoration plan that addresses the impacts of the proposed action.

1. a written report identifying environmental goals and objectives of the restoration or compensation proposed;

2. measurable specific criteria for evaluating whether or not the goals and objectives of the mitigation or restoration project have been successfully attained and whether or not the requirements of this Part 20.25H have been met; and

3. written specifications and descriptions of the restoration or mitigation proposed, such as:

Where the mitigation plan is submitted in phases pursuant to subsection A above, the written specifications may be general in nature for the conceptual phase, including general identification of areas for work, planting species, size and number. The more precise details may be provided in the detail plan phase.

These written specifications shall be accompanied by detailed site diagrams, scaled cross-sectional drawings, topographic maps showing slope percentage and final grade elevations, and any other drawings appropriate to show construction techniques or anticipated final outcome.

C. Timing of Work. Unless a different time period is established in another section of this Part 20.25H, or is established by the Director in the approval for a specific project, all work

required in a mitigation or restoration plan shall be completed within one year of the completion of the work triggering the need for mitigation or restoration.

D. Monitoring Program. The plan shall include a program for monitoring construction of the mitigation project and for assessing a completed project. The compensation project shall be monitored for a period necessary to establish that performance standards have been met, but not for a period less than five (5) years. The required monitoring period for a plan involving restoration only shall be reduced to a period of not less than three (3) years.

E. Contingency Plan. The mitigation plan shall include identification of potential courses of action, and any corrective measures to be taken if monitoring or evaluation indicates project performance standards are not being met and such failure would result in significant impact on the critical area or buffer. A plan involving restoration only is not required to include a contingency plan.

F. Assurance Devices. The director may require assurance devices to ensure that the approved mitigation, monitoring program, contingency plan and any conditions of approval are fully implemented. Assurance devices shall be posted in accordance with LUC 20.40.490.

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20.25H.225 Innovative Mitigation

The director may encourage, facilitate, and approve innovative mitigation projects that are based on the best available science.

XII. CRITICAL AREAS REPORT

20.25H.230 Critical Area Report -- Purpose

A Critical Areas Report is a mechanism by which the requirements of Part 20.25H may be modified for a specific proposal. The Critical Areas Report must demonstrate that the proposal with the requested modifications leads to equivalent or better protection of critical area functions and values as would result from the application of the requirements of this Part 20.25H. The Critical Areas Report is intended to provide flexibility for sites where the expected critical area functions and values are not present due to degraded conditions or other unique site characteristics, or for proposals providing unique design or protection of critical area functions and values not anticipated by this Part.

20.25H.235 Critical Area Report -- Review Process.

Requests for modifications to the requirements of Part 20.25H through a Critical Areas Report shall be processed through a critical areas land use permit. Where additional permits are required for the underlying use or activity, the permits may be merged.

20.25H.240 Critical Area Report --Limitation on Modifications.

The Critical Areas Report may be used to modify the requirements of this Part 20.25H, except where otherwise stated, certain requirements of Part 20.25E as set forth in that Part, and the impervious surface standards set forth in 20.20.010. The Critical Areas Report may not be used to modify other sections of the Land Use Code, including uses allowed in land use districts, LUC 20.10.440; and transition area requirements, Part 20.25B. Additional limitations on

modifications for specific critical areas may be found in the sections of this Part 20.25H addressing that critical area.

20.25H.245 Incorporation of Best Available Science.

The critical area report shall use scientifically valid methods and studies in the analysis of critical area data and field reconnaissance and reference the source of science used, where applicable. The critical area report shall evaluate the proposal and all probable impacts to critical areas in accordance with the provisions of this Part 20.25H..

20.25H.250 Critical Area Report – Report Contents.

A. General. The critical area report shall be prepared by a qualified professional and shall at minimum include the content identified in this section. Details about the contents of restoration and mitigation plans will be developed by the director in submittal requirements. The director may waive any of the report requirements, where, in the director's discretion, the information is not necessary to assess the impacts of the proposal and the level of protection of critical area function and value accomplished.

B. Minimum Report Contents. At a minimum, the report shall contain the following:

1. Identification and characterization of all critical areas and critical area buffers on the site and on those properties immediately adjacent to the site;

2. A habitat assessment consistent with the requirements of 20.25H.165;

3. An assessment of the probable cumulative impacts to critical areas resulting from development of the site and the proposed development;

4. An analysis of the level of protection of critical area functions and values provided by regulation of the site under Part 20.25H, in contrast with the level of protection provided by the proposal;

5. A discussion of the performance standards applicable to the critical area and proposed activity pursuant to LUC 20.25H.160, and recommendation for additional performance standards, if any; and

6. Any additional information required for the specific critical area as specified in the sections of this Part 20.25H addressing that critical area.

C. Additional Report Contents.

1. Unless otherwise provided, a critical area report may be supplemented by or composed, in whole or in part, of any reports or studies required by other laws and regulations or previously prepared for and applicable to the development proposal site, as approved by the director.

2. Where a project requires a critical area report and a mitigation or restoration plan, the mitigation or restoration plan may be included with the critical areas report.

3. The applicant may consult with the director prior to or during preparation of the critical area report to obtain approval of modifications to the required contents of the report where, in the judgment of a qualified professional, more or less information is required to adequately address the potential critical area impacts and required mitigation.

D. Incorporation of Previous Study. Where a valid critical areas report has been prepared within the last five (5) years for a specific site, and where the proposed land use activity and surrounding site conditions are unchanged, said report may be incorporated into the required critical area report. The applicant shall submit an assessment detailing any changed environmental conditions associated with the site.

20.25H.255 Critical Area Report -- Assurance Devices. The director may require assurance devices to ensure that any conditions of approval are fully implemented. Assurance devices shall be posted in accordance with LUC 20.40.490.

Section 4. This ordinance shall take effect on December 1, 2005.

PASSED by the City Council this _____ day of _____, 2005, and signed in authentication of its passage this _____ day of _____, 2005.

(SEAL)

_____
Connie B. Marshall, Mayor

Approved as to form:

Lori M. Riordan, City Attorney

_____

Attest:

_____
Myrna L. Basich, City Clerk

Published _____

CITY OF BELLEVUE, WASHINGTON
ORDINANCE NO.

AN ORDINANCE amending the Bellevue Land Use Code to amend the Shoreline Overlay District to recognize shorelines and critical areas and amend certain provisions to protect those critical areas; amending Sections 20.25E.010, 20.25E.017, 20.25E.020, 20.25E.030, 20.25E.040, 20.25E.050, 20.25E.055, 20.25E.060, 20.25E.070, 20.25E.080 of the Bellevue Land Use Code; and establishing an effective date.

WHEREAS, [insert a number of whereas clauses that describe why the City is processing the amendment based on BAS, public comment and Comprehensive Plan]; and

WHEREAS, the Planning Commission held a public hearing on July 6, 2005 with regard to such proposed Land Use Code amendment; and

WHEREAS, the Planning Commission recommends that the City Council approve such proposed amendment; and

WHEREAS, the City of Bellevue has complied with the State Environmental Policy Act (SEPA), Chapter 43.21C RCW, and the City's Environmental Procedures Code, BCC 22.02; now, therefore,

THE CITY COUNCIL OF THE CITY OF BELLEVUE, WASHINGTON, DOES ORDAIN AS FOLLOWS:

Section 1. Section 20.25E.010 of the Bellevue Land Use Code is hereby amended as follows:

20.25E.010 Definition of district.
The Shoreline Overlay District encompasses those lake waters 20 acres in size or greater and those stream waters with a mean annual water flow exceeding 20 cubic feet per second; the lands underlying them; the lands extending landward for 200 feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward 200 feet from such floodways associated with such streams and lakes; and marshes, bogs, swamps and river deltas associated with such streams and lakes. Specifically included within the district are the following:

A. Lake Washington, including Mercer Slough upstream to Interstate 405 – The lake waters, underlying lands and the area 200 feet landward of the ordinary high water mark, plus associated floodways, floodplains, marshes, bogs, swamps, and river deltas;

B. Lake Sammamish – The lake waters, underlying lands and the area 200 feet landward of the ordinary high water mark, plus associated floodways, floodplains, marshes, bogs, swamps and river deltas;

C. Lower Kelsey Creek – The creek waters, underlying lands, and territory between 200 feet on either side of the top of the banks, plus associated floodways, floodplains, marshes, bogs, swamps and river deltas; and

D. Phantom Lake – The lake waters, underlying lands and the area 200 feet landward of the ordinary high water mark, plus associated floodways, floodplains, marshes, bogs, swamps and river deltas.

Development within the Shoreline Overlay District may also be subject to the requirements of LUC Part 20.25H. In the event of a conflict between the provisions of this Part 20.25E and LUC Part 20.25H, the provisions providing the most protection to critical area functions and values shall prevail.

Section 2. Section 20.25E.017 of the Bellevue Land Use Code is hereby amended as follows:

20.25E.017 Definitions specific to the Shoreline Overlay District.

As used in this chapter, the following definitions apply:

A. Development.

A use consisting of the construction or exterior alteration of structures, dredging, drilling, dumping, filling, removal of any sand, gravel or minerals, bulkheading, driving of piling, placing of obstructions, or any other project of a permanent or temporary nature which interferes with the normal public use of the surface of the waters overlying lands subject to this Master Program at any state of water level.

B. Height.

Measured from average grade level (the average of the natural or existing topography of the portion of the lot, parcel, or tract of real property which will be directly under the proposed building or structure) to the highest point of a structure; provided, that television antennas, chimneys, and similar appurtenances shall not be used in calculating height, except where they obstruct the view of a substantial number of residences; provided further, that temporary construction equipment is excluded in this calculation.

C. Structure.

A permanent or temporary edifice or building, or any piece of work artificially built or composed of parts joined together in some definite manner, whether installed on, above, or below the surface of the ground or water, except for vessels.

D. Shoreline Critical Area.

The following water bodies are hereby designated as shoreline critical areas:

1. Lake Washington, including Mercer Slough upstream to Interstate 405 – The lake waters underlying lands plus associated floodways, floodplains, marshes, bogs, swamps and river deltas;

2. Lake Sammamish – The lake waters and underlying lands, plus associated floodways, floodplains, marshes, bogs, swamps and river deltas;

3. Lower Kelsey Creek – The creek waters, underlying lands, plus associated floodways, floodplains, marshes, bogs, swamps and river deltas; and

4. Phantom Lake – The lake waters, underlying lands, plus associated floodways, floodplains, marshes, bogs, swamps and river deltas.

E. Shoreline Critical Area Buffer.

That area designated as the shoreline critical area buffer under LUC 20.25H.035. The shoreline critical area buffer may be modified pursuant to the provisions of Part 20.25H.

F. Critical Areas Report.

The process described in LUC 20.25H.XXX that allows for modification of regulations applicable to the shoreline critical area and shoreline critical area buffer. Provisions of this 20.25E may also be modified using a critical areas report where specifically allowed.

Section 3. Section 20.25E.020 of the Bellevue Land Use Code is hereby amended as follows:

20.25E.020 Authority and purpose.

The Shoreline Overlay District for the City is hereby adopted by authority of Chapter 90.58 RCW, the Shoreline Management Act of 1971 as amended, the same being incorporated herein by this reference as though fully set forth in this title, and more particularly, to fulfill the public purpose preserving the state's and City's important shoreline natural resources, and further, to protect and promote the public health, safety and general welfare.

Section 4. Section 20.25E.030 of the Bellevue Land Use Code is hereby amended as follows:

20.25E.030 Interpretation – Administration by City.

The Bellevue Shoreline Overlay District is supplementary to the underlying land use districts. When conflict arises between regulations of the Shoreline Overlay District and underlying land use districts, regulations of the Shoreline Overlay District shall prevail. When conflict arises between regulations of the Shoreline Overlay District and other special districts, such as the Critical Area Overlay District, the regulations providing the most protection to critical area functions and values shall prevail.

Section 5. Section 20.25E.040 of the Bellevue Land Use Code is hereby amended as follows:

20.25E.040 Substantial Development Permit required.

A Substantial Development Permit is required for all development within the Shoreline Overlay District, with the exceptions noted in LUC 20.25E.050. Procedures for securing a Substantial Development Permit shall be as set forth in Chapter 173-14 WAC and Part 20.30R LUC. All information reasonably required to enable the City to make a full evaluation of proposed development in shoreline areas shall be provided by applicants for a Substantial Development Permit.

Section 6. Section 20.25E.050 of the Bellevue Land Use Code is hereby amended as follows:

20.25E.050 Exemptions from Substantial Development Permit system – Letter of exemption required.

The following developments shall not require Substantial Development Permits so long as they are consistent with the policy of the State Shoreline Management Act, Chapter 173-14 WAC, the City's Shoreline Master Program, and the applicable requirements of this Part 20.25E. However, a letter of exemption from the City shall be required for any such development, to be forwarded to the Department of Ecology and the Attorney General's Office when required by WAC 173-14-115. Exemptions from the Substantial Development Permit system are as follows:

A. Any development of which the total cost or fair market value, whichever is higher, does not exceed $2,500, if such development does not materially interfere with the normal public use of the water or Shoreline Overlay District;

B. Normal maintenance or repair of existing structures or developments, including damage by accident, fire or elements. "Normal maintenance" includes those usual acts to prevent a decline, lapse, or cessation from a lawfully established condition; "Normal repair" means to restore a development to a state comparable to its original condition within a reasonable period after decay or partial destruction except where repair involves total replacement which is not common practice or causes substantial adverse effects to the Shoreline Overlay District resource or environment. Replacement of existing pilings in the same location shall constitute "normal repair" under this section. Although such normal repair or replacement is exempt from the Substantial Development Permit system, certain limitations may apply to the repair or replacement of nonconforming structures, shoreline stabilization measures and moorage. See LUC 20.25E.055 (nonconforming structures), LUC 20.25E.080.E (shoreline stabilization), and LUC 20.25E.080.N (moorage);

C. Construction of the normal protective bulkhead common to single-family residences. A "normal protective" bulkhead is constructed at or near the ordinary high water mark to protect a single-family residence and is for protecting land from erosion, not for the purpose of creating land. Where an existing bulkhead is being replaced, it shall be constructed no further waterward of the existing bulkhead than is necessary for construction of new footings. See LUC 20.25E.080.E for additional provisions regarding shoreline stabilization measures;

D. Emergency construction necessary to protect property from damage by the elements. An "emergency" is an unanticipated and imminent threat to public health, safety, or the environment which requires immediate action within a time too short to allow full compliance with this chapter. The director, or the designee thereof, shall designate when such an action constitutes an emergency action. Where the emergency action involves development or disturbance in the shoreline critical area or shoreline critical area buffer, the person or agency undertaking the emergency action shall also comply with LUC 20.25H.070

E. Construction and practices normal or necessary for farming, irrigation, and ranching activities, including agricultural service roads and utilities construction of a barn or similar agricultural structure, and the construction and maintenance of irrigation structures including but not limited to head gates, pumping facilities, and irrigation channels; provided, that a feedlot of any size, all processing plants, other activities of a commercial nature, alteration of the contour of the property by leveling or filling other than that which results from normal cultivation, shall not be considered normal or necessary farming or ranching activities. A feedlot shall be an enclosure or facility used or capable of being used for feeding livestock hay, grain, silage, or other livestock feed, but shall not include land for growing crops or vegetation for livestock feeding and/or grazing, nor shall it include normal livestock wintering operations;

F. Construction or modification of navigational aids, such as channel markers or anchor buoys;

G. Construction by an owner, lessee, or contract purchaser of a single-family residence, and/or accessory structure thereto, for his own or his family use which does not exceed a height of 35 feet above average grade level.

"Single-family residence" means a detached dwelling designed for and occupied by one family including those structures and developments within a continuous ownership which are a normal appurtenance.

An "appurtenance" is necessarily connected to the use and enjoyment of a single-family residence and is located landward of the perimeter of a marsh, bog, or swamp. Normal appurtenances include a garage; deck; driveway; utilities; fences; and grading which does not exceed 250 cubic yards (except to construct a conventional drainfield). Construction authorized under this exemption shall be located landward of the line of ordinary high water mark;

H. Construction of a dock, including a community dock, designed for pleasure craft only, for the private noncommercial use of the owner, lessee, or contract purchaser of single-family and multiple residence(s), for which the cost or fair market value, whichever is higher, does not exceed $2,500;

I. Operation, maintenance, or construction of canals, waterways, drains, reservoirs, or other facilities that now exist or are hereafter created or developed as a part of an irrigation system for the primary purpose of making use of system waters, including return flow and artificially stored ground water for the irrigation of lands;

J. The marking of property lines or corners on state-owned lands, when such marking does not significantly interfere with normal public use of the surface of the water;

K. Operation and maintenance of any system of dikes, ditches, drains, or other facilities existing on September 8, 1975, which were created, developed or utilized primarily as a part of an agricultural drainage or diking system;

L. Any project with certification from the governor pursuant to Chapter 80.50 RCW; and

The above exemptions shall be construed narrowly and shall not exempt a project from other City of Bellevue ordinance or permit regulations; further, exempted development shall be consistent with the policies and provisions of the Shoreline Management Act, the Shoreline Management Program Element of the Bellevue Comprehensive Plan and this Part 20.25E.

Section 7. Section 20.25E.055 of the Bellevue Land Use Code is hereby amended as follows:

20.25E.055 Nonconforming development. See performance standards at 20.25H.**XXX** for provisions relating to the repair, remodeling, expansion or reconstruction of structures located in the Area of Special Flood Hazard. Any alterations to existing structures allowed under this Section 20.25E.055 shall also comply with those provisions. In the event of conflict, the provisions for the Area of Special Flood Hazard shall govern.

A. Definitions. Nonconforming development means a Shoreline Overlay District use or structure which was lawfully constructed or established prior to the effective date of the Shoreline Management Act or the Bellevue Shoreline Master Program, whichever is applicable, or amendments thereto, but which does not conform to present regulations or standards of the Master Program or policies of the Shoreline Management Act.

B. Non-conforming Development outside the shoreline critical area and shoreline critical area buffer.

1. Nonconforming development may be continued; provided, that it is not enlarged, intensified, increased, or altered in any way which increases its nonconformity;

2. A nonconforming development which is moved any distance must be brought into conformance with this part and the Shoreline Management Act;

3. If a nonconforming development is damaged to an extent not exceeding 75 percent replacement cost of the original structure, it may be reconstructed to those configurations existing immediately prior to the time the structure was damaged, so long as restoration is completed within one year of the date of damage.

C. Nonconforming Development within the shoreline critical area or shoreline critical area buffer. The requirements of this subsection C may be modified through a critical areas report, LUC 20.25H.XXX.

1. Single-Family Residential Development (other than moorage and bulkheads).

    a. Primary Structures.

        i. Repair of an existing nonconforming structure is permitted.

        ii. Remodeling of an existing primary structure is permitted provided the fair market value of the remodel does not exceed 100 percent of the replacement value of the structure over any three-year period. If remodeling exceeds 100 percent of the replacement value over any three-year period, the structure shall be brought into compliance with existing Land Use Code requirements, including requirements of this Part and Part 20.25H.

        iii. An existing primary structure may not be expanded unless the expansion conforms to the regulations of this Code, or unless the expansion is an expansion upwards within the existing footprint of the structure. However, expansion into the shoreline critical area buffer may be allowed, pursuant to a Critical Areas Land Use permit, where expansion outside of the shoreline critical area buffer is not feasible and where the purpose of the expansion is to serve a function that is an essential component of a single-family residence. Expansion into the shoreline critical area is prohibited.

            (A) Where allowed, expansions into the shoreline critical area buffer shall be limited as follows:

                1 The expansion shall be along the existing line of nonconformity, unless such expansion is not feasible. Only when such expansion is not feasible may expansion encroach further into the shoreline critical area buffer.
                2 Expansions into the shoreline critical area buffer shall be the minimum necessary to achieve the intended functions of the expansion, but in no event may the footprint expansion within the shoreline critical area buffer exceed 500 square feet over the life of the structure;
                3 Areas of new permanent disturbance and all areas of temporary disturbance within the shoreline critical area buffer shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.XXX; and
                4 Work within the shoreline critical area buffer shall comply with the applicable performance standards in LUC 20.25H.XXX.

            B. For purposes of this section, expansion outside of the shoreline critical area buffer shall be considered not feasible only when, considering the function to be served by the expansion and the existing structure's layout and infrastructure:

                1 expansion away from the shoreline critical area buffer within the buildable area of the site will not realize the intended functions of the expansion; and

2 expansion away from the shoreline critical area buffer, including into non-critical area setbacks modified pursuant to LUC 20.25H.040, will not realize the intended functions of the expansion; and

3 expansion upwards to the maximum building height allowed under LUC 20.25E.050.G, within the existing footprint, or together with expansions permitted under subsections (c)(ii)(A) and (B) above, will not realize the intended functions of the expansion.

iv. If an existing primary structure or any portion thereof is destroyed by fire, explosion, or other unforeseen circumstance, it may be reconstructed to substantially the same condition as and within the footprint existing at the time of destruction; provided that such reconstruction is commenced within one year of the date of destruction and diligently pursued. Any proposal to improve the condition of the primary structure in connection with such reconstruction shall be subject to the limitations of subsection ii above. Additional disturbance outside of the area of the previous footprint resulting from the reconstruction shall be promptly restored pursuant to a mitigation plan approved by the Director under LUC 20.25H.XXX**.**

b. Non-primary structures, including appurtenances.

i. Repair and remodeling of an existing structure, other than the primary structure, is limited to minor, non-structural repairs, and repairs of mechanical systems within or supporting the structure. If repair or remodeling exceeds these limits, the structure shall be brought into compliance with existing Land Use Code requirements, including requirements of this Part and Part 20.25H.

ii. Expansion of existing structures, other than the primary structure, into the shoreline critical area and critical area buffer is prohibited.

iii. If any portion of an existing structure, other than the primary structure, is damaged or destroyed by fire, explosion or other unforeseen circumstance requiring repairs consistent with those allowed under subsection (i) above, it may be reconstructed within the footprint existing at the time of destruction; provided that such reconstruction is commenced within one year of the date of destruction and diligently pursued. Additional disturbance outside of the area of the previous footprint resulting from the reconstruction shall be promptly restored pursuant to a mitigation plan approved by the Director under LUC 20.25H.XXX**.** If such a structure is destroyed and requires structural or other repairs more extensive than those allowed under subsection (i) above, then any reconstruction of such structure shall be in compliance with existing Land Use Code requirements, including requirements of this Part and Part 20.25H.

c. Existing Landscaping. Routine maintenance of existing legally established landscaping and landscape features developed prior to December 1¸ 2005 in the critical area or critical area buffer may be continued in accordance with

this section. For purposes of this section, routine landscape maintenance activities include mowing, pruning, weeding, planting annuals, perennials, fruits and vegetables, and other activities associated with maintaining a legally established ornamental or garden landscape and landscape features. Also, for purposes of this subsection, landscape features refers to fences, trellises, rockeries and retaining walls, pathways, arbors, patios, play areas and other similar improvements. To be considered routine maintenance, activities shall have been consistently carried out so that the ornamental species predominate over native or invasive species. Wholesale clearing of areas within 25 feet of a critical area may be allowed only as a habitat improvement project under LUC 20.25H.070. Maintenance shall be performed with hand tools only, and no trees may be removed, except in accordance with LUC 20.25H.070. Use of fertilizers, insecticides and pesticides is prohibited unless performed in accordance with the City of Bellevue's "Environmental Best Management Practices" now or as hereafter amended.

2. Multi-family and Commercial Development. The director may allow proportional compliance with the following requirements as provided for in LUC 20.20.560.C.4.

    a. Primary structures.

        i. Repair of an existing primary structure is permitted.

        ii. Remodeling of an existing primary structure is permitted provided the fair market value of the remodel does not exceed 100 percent of the replacement value of the structure over any three-year period. If remodeling exceeds 100 percent of the replacement value over any three-year period, the structure shall be brought into compliance with existing Land Use Code requirements, including requirements of this Part and Part 20.25H.

        iii. An existing primary structure within the shoreline critical area buffer may not be expanded unless the expansion conforms to the requirements of the Code, including requirements of this Part and Part 20.25H.

        iv. If an existing primary structure or any portion thereof is destroyed by fire, explosion, or other unforeseen circumstance, it may be reconstructed to substantially the same condition as and within the footprint in existence at the time of destruction; provided that such reconstruction is commenced within one year of the date of destruction and diligently pursued. Any proposal to improve the condition of the primary structure in connection with such reconstruction shall be subject to the limitations of subsection ii above. Additional disturbance outside of the area of the previous footprint resulting from the reconstruction shall be promptly restored pursuant to a mitigation plan approved by the Director under LUC 20.25H.XXX**.**

b. Non-primary structures.

i. Repair and remodeling of an existing structure, other than the primary structure, is limited to minor, non-structural repairs, and repairs of mechanical systems within or supporting the structure. If repair or remodeling exceeds these limits, the structure shall be brought into compliance with existing Land Use Code requirements, including requirements of this Part and Part 20.25H.

ii. Expansion of existing structures, other than the primary structure, into the shoreline critical area and critical area buffer is prohibited.

iii. If an existing structure, other than the primary structure, is destroyed by fire, explosion or other unforeseen circumstance requiring repairs consistent with those allowed under subsection (i) above, it may be reconstructed within the footprint existing at the time of destruction; provided that such reconstruction is commenced within one year of the date of destruction and diligently pursued. Additional disturbance outside of the area of the previous footprint resulting from the reconstruction shall be promptly restored pursuant to a mitigation plan approved by the Director under LUC 20.25H.XXX**.** If such a structure is destroyed and requires structural or other repairs more extensive than those allowed under subsection (i) above, then any reconstruction of such structure shall be in compliance with existing Land Use Code requirements, including requirements of this Part and Part 20.25H.

c. Existing Landscaping. Routine maintenance of existing legally established landscaping and landscape features developed prior to December 1¸ 2005 in the critical area or critical area buffer may be continued in accordance with this section. For purposes of this section, routine landscape maintenance activities include mowing, pruning, weeding, planting annuals, perennials, fruits and vegetables, and other activities associated with maintaining a legally established ornamental or garden landscape and landscape features. Also, for purposes of this subsection, landscape features refers to fences, trellises, rockeries and retaining walls, pathways, arbors, patios, play areas and other similar improvements. To be considered routine maintenance, activities shall have been consistently carried out so that the ornamental species predominate over native or invasive species. Wholesale clearing of areas within 25 feet of a critical area may be allowed only as a habitat improvement project under LUC 20.25H.070. Maintenance shall be performed with hand tools only, and no trees may be removed, except in accordance with LUC 20.25H.070. Use of fertilizers, insecticides and pesticides is prohibited unless performed in accordance with the City of Bellevue's "Environmental Best Management Practices" now or as hereafter amended.

3. Docks and Bulkheads.

a. Bulkheads. Legally established bulkheads may be repaired and replaced in accordance with LUC 20.25E.080.E.

b. Moorage. Legally established covered and uncovered moorage may be repaired and replaced in accordance with LUC 20.25E.080.N

D. Nonconforming Uses.

1. If a nonconforming use is discontinued for 12 consecutive months or for 12 months during any two-year period, any subsequent use shall be conforming. It shall not be necessary to show that the owner of the property intends to abandon such nonconforming use in order for the nonconforming rights to expire; and

2. A nonconforming use shall not be changed to another nonconforming use, regardless of the conforming or nonconforming status of the building or structure in which it is housed.

Section 8. Section 20.25E.060 of the Bellevue Land Use Code is hereby amended as follows:

20.25E.060 Use regulations and policies governing permits.

The uses established by LUC 20.10.440 for the applicable land use district may be undertaken in the Shoreline Overlay District as allowed for the underlying land use district. All development associated with the use shall comply with the provisions of this Part 20.25E. General performance standards applying to all permits and specific regulations for certain types of uses are found in LUC 20.25E.080, "Shoreline Performance Standards". In addition, all uses and permits must be in conformance with the Shoreline Master Program Policy Element of the Bellevue Comprehensive Plan. Uses and permits within the shoreline critical area and shoreline critical area buffer must also be in conformance with the applicable performance standards of LUC 20.25H.060 or LUC 20.25H.070.

Section 9. Section 20.25E.070 of the Bellevue Land Use Code is hereby amended as follows:

20.25E.070 Permits.

Land use approvals in a Shoreline Overlay District shall follow the procedures established for the proposal in the underlying land use district, except as follows: as set forth in LUC 20.25E.080.W (Shoreline Conditional Uses); as set forth in LUC 20.25E.080.V(Variances to the Shoreline Master Program); and as set forth in LUC 20.25E.040 (Shoreline Substantial Development).

Section 10. Section 20.25E.080 of the Bellevue Land Use Code is hereby amended as follows:

20.25E.080 Shoreline Performance Standards.

A. Policy and Administration.

1. The Shoreline Master Program Performance Standards, as adopted by the City of Bellevue by Resolution 2441, as amended by this Code, and as required by Chapter 98.58 RCW, regulate development in the Shoreline Overlay District.

2. The performance standards developed for the Lake Washington, Lake Sammamish, lower Kelsey Creek and Phantom Lake shorelines are derived directly from state policies pertaining to applicable activity. Some of the conditions are designated as mandatory requirements for the various use activities, while others are regarded as factors to guide discretionary decisions.

3. The City through the administration of this Code must advise affected parties, upon application for permits, of the need for compliance with federal and state law when their existence is known and further must advise the applicants when there is a probability of the existence of regulations administered by other agencies with suspected jurisdiction.

B. General Regulations Applicable to all Land Use Districts and Activities.

1. Where applicable, all federal and state water quality and effluent standards shall be met.

2. If a property extends into the Shoreline Overlay District, the Shoreline Master Program Policies and these use regulations shall apply only to that portion of the property lying within the Shoreline Overlay District.

3. All development within the Shoreline Overlay District shall be accompanied by a plan indicating methods of preserving shoreline vegetation and for control of erosion during and following construction in accordance with Part 20.25H, City of Bellevue Clearing and Grading regulations, BCC Ch. 23.76, and the Comprehensive Plan.

4. Special care shall be exercised to preserve vegetation in wetland and stream corridor bank areas in order to prevent soil erosion. Removal of vegetation from or disturbance of shoreline critical areas and shoreline critical area buffers, and from other critical area and critical area buffers shall be prohibited, except in conformance with Part 20.25H and the specific performance standards of this section.

5. Maximum height limitation for any proposed structure within the Shoreline Overlay District shall be 35 feet, except in land use districts with more restrictive height limitations. The method of measuring the maximum height is described in WAC 173-14-030(6). Variances to this height limitation may be granted pursuant to Part 20.30H LUC.

6. The Bellevue Shoreline Master Program, in conjunction with existing Bellevue land use ordinances and Comprehensive Plan policies, shall guide all land use decisions in the Shoreline Overlay District.

7. Any development within the Shoreline Overlay District shall comply with all applicable Bellevue ordinances, including but not limited to the Bellevue Land Use Code, Sign Code, and clearing and grading regulations.

8. The dead storage of watercraft seaward of the ordinary high water mark of the shoreline is prohibited.

9. Where applicable, state and federal standards for the use of herbicides, pesticides and/or fertilizers shall be met, unless superseded by City of Bellevue ordinances. Use of such substances in the shoreline critical area and shoreline critical area buffer shall be governed by Part 20.25H.

10. Adequate storm drainage and sewer facilities must be operational prior to construction of new development within the Shoreline Overlay District. Storm drainage facilities shall be separated from sewage disposal systems.

C. Agricultural Use Regulations.

1. Minimum lot dimensions for a single-family dwelling within those areas of the Shoreline Overlay District designated Agriculture shall be 200 feet, length and width. Minimum setback requirements: front yard, 50 feet minimum; side and rear yards, 25 feet minimum. All structures, accessory buildings and ancillary facilities (e.g., manure stockpiles, retention ponds and storage ponds) shall be located outside of the shoreline critical area buffer.

2. In those areas of the Shoreline Overlay District in which agricultural uses are permitted, habitable structures and accessory buildings may not exceed 35 percent of the lot area, and may not exceed a height maximum of 35 feet.

3. All structures, accessory buildings and ancillary facilities shall be built and located in such a manner so as to prevent agricultural wastes from entering ground and surface water.

4. Unless superseded by stricter City of Bellevue ordinances, erosion control measures shall be applied in accordance with the applicable guidelines and standards established by the Soil Conservation Service, U.S. Department of Agriculture.

5. New agricultural uses in the shoreline critical area and shoreline critical area buffer are prohibited. In addition to the standards of this section, legally established agricultural uses shall also meet the requirements of LUC 20.25H.060.

D. Aquaculture Regulations.

1. When construction of aquaculture structures is permitted, it shall be done with minimum disturbance to the existing shorelines.

2. The quality of water discharged into critical areas from rearing ponds shall not adversely affect the quality of the recipient waters or associated wetlands.

3. No structure which might reasonably hinder the passage of anadromous fish shall be permitted within the Shoreline Overlay District.

4. In addition to the standards of this section, aquaculture uses shall also meet the requirements of LUC 20.25H.060 (existing activities) or 20.25H.070 (new activities).

E. Shoreline Stabilization, including existing Bulkheads Shoreline stabilization is allowed in the shoreline critical area and shoreline critical area buffer in compliance with this subsection E. The requirements of this subsection E may be modified through a critical areas report, LUC 20.25H.XXX.

1. Definitions.

a. Hard Shoreline Stabilization Measures. As used in this Part, hard shoreline stabilization measures include: rock revetments, gabions, concrete groins, retaining walls, bulkheads and similar measures which present a vertical or nearly vertical interface with the water.

b. Soft Shoreline Stabilization Measures. As used in this Part, soft shoreline stabilization measures include: biotechnical measures, beach enhancement, anchor trees, gravel placement, stepped back rockeries, shoreline plantings and similar measures that use natural materials engineered to provide shoreline stabilization while mimicking or preserving the functions and values of the shoreline critical area.

c. Shoreline Stabilization Measures. As used in this Part, shoreline stabilization measures refers collectively to both hard and soft shoreline stabilization measures.

d Avoidance Measures. As used in this Part, avoidance measures refer to techniques used to minimize or prevent shoreline erosion that do not involve modification of the shoreline at the interface of land and water. Avoidance measures include vegetation enhancement, upland drainage control, and protective walls or embankments placed outside of the shoreline critical area and critical area buffer.

e. Technically feasible. The determination of whether a technique or stabilization measure is technically feasible shall be made by the Director as part of the decision on the underlying permit after consideration of a report prepared by a qualified professional addressing the following factors:

i. site conditions, including topography and the location of the primary structure in relation to the Ordinary High Water Mark;
ii. the location of existing infrastructure necessary to support the proposed measure or technique;
iii. the level of risk to the primary structure or land area presented by shoreline erosion and ability of the proposed measure to mitigate that risk;
iv. whether the cost of avoiding disturbance of the shoreline critical area or shoreline critical area buffer is disproportionate as compared to the environmental impact of proposed disturbance, including any continued impacts on functions and values over time; and
v. the ability of both permanent and temporary disturbance to be mitigated.

f. Allowed land area. As used in this Part, allowed land area is the land area within 25 feet of the existing primary structure landward of the ordinary high water mark.

g. Minor Repair. As used in this Part, minor repair refers to modifications or improvements to an existing shoreline stabilization measure that are designed to ensure the continued function of the stabilization measure by preventing failure of any part of the stabilization measure. A repair that is proposed after a significant portion of the stabilization measure has collapsed, eroded away or otherwise demonstrated a loss of structural integrity is not a minor repair.

2. New or enlarged shoreline stabilization measures.

a. When Allowed. New or enlarged shoreline stabilization measures shall be allowed only to protect existing primary structures and allowed land area. Shoreline stabilization measures shall be allowed only where avoidance measures are not technically feasible.

b. Type of Shoreline Stabilization Measure Used. Where a new or enlarged shoreline stabilization measure is allowed, soft shoreline stabilization measures shall be used, unless the applicant demonstrates that soft shoreline stabilization measures are not technically feasible. An applicant asserting that soft stabilization measures are not technically feasible shall provide the information relating to each of the factors set forth in subsection 1.e. for a determination of technical feasibility by the director. Only after a determination that soft shoreline stabilization measures are not technically feasible shall hard shoreline stabilization measures be permitted.

c. Location. Shoreline stabilization measures shall be located at or behind the ordinary high water mark. Soft shoreline stabilization measures may also be located waterward of the ordinary high water mark.

d. Height limit. The height of any new or expanded hard shoreline stabilization measure shall not exceed 30 inches from average grade of actual or existing topography or, if at the ordinary high water mark, the ordinary high water mark; except that bulkhead heights may be increased if approved by the Director if the following criteria are satisfied:

i. Increased height does not negatively impact abutting properties; and

ii. Increased height is necessary to protect the existing primary structure or allowed land area because of:

(1) Slopes of 40% or greater at and immediately landward of the ordinary high water mark. In such instances, increased height shall be limited to the minimum height necessary to protect the existing primary structure and allowed land area, or

(2) Extraordinary wave action as demonstrated in a report prepared by a qualified professional. In such instances, increased height shall be limited to the minimum height necessary to protect the existing primary structure and allowed land area or 45 inches, whichever is less.

e. Mitigation and Restoration. Areas of new permanent disturbance and all areas of temporary disturbance within the shoreline critical area and shoreline critical area buffer shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.XXX.

3. Repair and Replacement of Existing Shoreline Stabilization. This section allows repair and replacement of existing legally established shoreline stabilization measures.

a. Minor Repair. Minor repair is permitted. Areas of temporary disturbance within the shoreline critical area or shoreline critical area buffer are restored pursuant to a restoration plan meeting the requirements of LUC 20.25H.XXX.

b. Major Repair or Replacement. Major repair or replacement shall be treated as a new shoreline stabilization measure, subject to the provisions of subsection 2 above.

4. Bulkheads shall be designed to minimize the transmission of wave energy to other properties.

5. Critical Area Buffer Modification. Where an applicant replaces a legally established existing hard shoreline stabilization measure with a soft shoreline stabilization measure or an avoidance measure, the critical area buffer and any applicable structure setback shall continue to be measured from the ordinary high water mark that existed with the hard shoreline stabilization measure. Such ordinary high water mark shall be located by a survey prior to removal of the hard shoreline stabilization measure.

F. Breakwaters, Jetties and Groins Regulations. Breakwaters, jetties and groins may be located in the shoreline critical area and shoreline critical area in compliance with this subsection F.

1. Solid landfill breakwaters shall be prohibited within the Shoreline Overlay District.

2. Breakwaters, jetties, groins, and weirs located waterward of the ordinary high-water mark shall be allowed only where necessary to support water-dependent uses, public access, shoreline stabilization, or other specific public purpose. Breakwaters, jetties, groins, weirs, and similar structures in the shoreline critical area or shoreline critical area buffer require a shoreline conditional use permit.

3. Breakwaters, jetties, groins, and weirs shall be designed by a qualified professional to protect the functions and values of the shoreline critical areas.

4. Areas of new permanent disturbance and all areas of temporary disturbance within the shoreline critical area and shoreline critical area buffer shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.XXX.**G. Clearing and Grading Regulations.**

1. All clearing, grading, excavating, and fill in the Shoreline Overlay District shall comply with the provisions of BCC Ch. 23.76, now or as hereafter amended.

2. No clearing, grading, excavating, or fill shall be allowed within the shoreline critical area or shoreline critical area buffer except as permitted by this Part 20.25E, or in association with activities allowed under Part 20.25H.

3. Wherever the City determines that the act or intended act of clearing, grading, excavation or fill has become or will constitute a hazard in life or limb, or endangers property, or adversely affects the safety, use of, or stability of a public way, drainage channel or natural stream corridor, including siltation and sedimentation therein, the owner of the property upon which the clearing, excavation or fill is located or other person or agent in the City shall, within the period specified therein terminate such clearing, grading, excavation, embankment or fill, or eliminate the same from the development plan, or modify the plans, as may be required so as to eliminate the hazard and be in conformance with the requirements of this Code.

H. Commercial Development Regulations.

1. Regardless of the provisions of LUC 20.10.440 and the underlying land use district, commercial development is not permitted on the City's Lake Sammamish shoreline.

2. The maximum building height in areas of the Shoreline Overlay District which are zoned for commercial uses shall be 35 feet, except in those zoning districts with more restrictive height limitations.

3. Tanks for the distribution and sale of petroleum products are not permitted in the Shoreline Overlay District except for marinas. When permitted, such tanks shall be located on dry land, and designed to preclude and contain spills. Such tanks shall not be permitted in corrosive soil areas.

4. Any commercial development located within the Shoreline Overlay District shall be equipped to contain and clean up pollutant spills, as required by state and federal regulations.

5. Parking facilities shall not be permitted over water or within the shoreline critical area or shoreline critical area buffer. Parking areas shall be permitted only when accessory to commercial uses. Provisions must be made to control and cleanse surface water runoff from the parking areas in order to comply with state water quality standards.

6. Commercial development along shorelines shall provide for erosion control.

7. Commercial development permitted within the Shoreline Overlay District, other than that related to water use, shall be located landward of the shoreline critical area buffer.

8. Commercial development in the Shoreline Overlay District oriented to the use of watercraft shall provide restrooms and hookups for toilet facilities. No watercraft shall flush toilet refuse into the lake at such locations. For the purposes of this section, commercial development shall include yacht clubs, commercial and private marinas, boat repair shops, fueling facilities and other similar uses.

Unless allowed under a critical areas report, LUC 20.25H.XXX, any structure associated with such commercial development shall be located landward of the shoreline critical area buffer, except moorage facilities allowed under subsection N.

I. Dredging Regulations. Dredging in the shoreline critical area or shoreline critical area buffer is allowed in compliance with this subsection I.

1. Dredging for the sole purpose of obtaining fill or construction material is prohibited.

2. Dredging shall be permitted only in the following cases:

   a. To maintain navigability to the extent of previously dredged and/or existing authorized location, depth, and width; or

   b. To improve water flow or water quality; or

   c. To mitigate conditions which could endanger public health or safety; or

   d. To carry out a habitat improvement project approved pursuant to LUC 20.25H.070; ore. To provide for the drainage of surface waters for approved development purposes.

   Dredging shall be limited to the minimum extent necessary to accomplish its permitted purpose.

3. The lateral spread of resuspended sediment created by a dredging operation shall be contained within previously approved limits.

4. Dredging spoils shall be deposited at dumping sites which are set back an adequate distance to prevent impairment of water quality. Dumping sites shall not be allowed except in areas designated by the City of Bellevue.

5. Dredging spoils stored at the dredging site shall be adequately contained to prevent leakage. Any drainage of the spoils shall be filtered sufficiently to prevent reentrance of sediments into the water.

6. Areas of new permanent disturbance and all areas of temporary disturbance within the shoreline critical area and shoreline critical area buffer shall be mitigated and/or restored pursuant to a mitigation and restoration plan meeting the requirements of LUC 20.25H.XXX.

J. Ecological and Historical Sites.

1. The designation of historical sites and related preservation activities is permitted in the Shoreline Overlay District.

2. Water fowl and wildlife preserves are a permitted use within the Shoreline Overlay District.

K. Landfill Regulations. Landfill within the shoreline critical area and shoreline critical area buffer is allowed in compliance with this subsection K.

(Note: Prohibited landfill materials are defined by the International Building Code, as adopted and subsequently amended by the City of Bellevue.)

1. Landfills within the Shoreline Overlay District shall be controlled to prevent significant adverse alteration in the storage and flow characteristics of the affected area.

2. Landfills which do not meet the requirements of this Code and the International Building Code, as adopted and subsequently amended by the City of Bellevue, are prohibited.

3. Landfill is prohibited except where necessary for:

   a. Improvement of water quality in the event no other possible alternatives are available;

   b. Replenishment of sand on public and private beaches;

   c. Establishment of an interpretive center when undertaken by, or in cooperation with, the City of Bellevue, if permitted under Part 20.25H LUC;

   d. In connection with an approved shoreline stabilization or avoidance measure, where permitted under subsection E;

   e. Where necessary to support a legally established water-dependent use;

   f. In connection with the cleanup and disposal of contaminated sediments as part of an interagency environmental clean-up plan,

   g. Disposal of dredged material considered suitable under, and conducted in accordance with the Dredged Material Management Program of the Department of Natural Resources;

   h. Expansion or alteration of transportation facilities of statewide significance currently located on the shoreline and then only upon a demonstration that alternatives to fill are not feasible; and

   i. Required mitigation actions.

   In such cases, landfill may be permitted provided there is no significant adverse impact upon fish, wildlife and adjacent property and shall be limited to the minimum extent necessary to accomplish its permitted purpose.

4. Landfill behind shoreline stabilization measures shall be limited to the height of bulkheads and shall be in compliance with paragraph E of this section.

5. No landfill shall be permitted waterward of the ordinary high water mark, except in connection with a habitat enhancement project approved pursuant to LUC

20.25H.XXX, or in connection with an approved shoreline stabilization measure in compliance with paragraph E of this section.

6. Landfill is prohibited within marshes, bogs and swamps and within wetlands except as provided for in Chapter 20.25H LUC.

7. In those limited instances where landfill is permitted, the waterside perimeter of the fill shall be stabilized with vegetation.

8. Applicants for landfills within the Shoreline Overlay District must also secure and perform in accordance with fill permits under the City's clearing and grading regulations, Chapter 23.76 BCC.

9. Landfills shall be permitted only when they are in complete conformance with all conditions of site development approval.

L. Mining Regulations.

Mining is not a permitted activity within the Bellevue Shoreline Overlay District.

M. Outdoor Advertising, Sign and Billboard Regulations. Signs may not be located within the shoreline critical area or shoreline critical area buffer.

1. Signs in residential areas of the Shoreline Overlay District shall be for identification only, noncommercial, unobtrusive in character and nonilluminated. Lighting from an external source shall be shielded from view.

2. Signs in the Shoreline Overlay District shall not obstruct the shoreline views of upland properties.

3. Signs in that portion of the Shoreline Overlay District which permits commercial activities shall be permitted provided such signs are physically oriented internally to the district and meet the requirements of the Bellevue Sign Code. No water-oriented advertising is permitted.

4. Any permitted use within that portion of the Shoreline Overlay District which permits commercial activities and which actually fronts on Lake Washington, will be permitted one identification sign oriented to the lake. Such sign may identify the business complex itself or gasoline service associated with the complex.

    a. If located on dry land, the signs shall comply with the size and placement requirements of the Bellevue Sign Code and illumination of the sign may be low-level internal illumination.

    b. If such sign is located on a pier, maximum size shall be 25 square feet and maximum height 10 feet above pier deck, and such sign may not be illuminated.

5. Off-premises signs, nonappurtenant, illuminated and freestanding signs extending above the roof line are not permitted in the Shoreline Overlay District.

6. Sign structures must meet all other conditions of the Bellevue Sign Code.

N. Moorage Regulations. Shoreline stabilization is allowed in the shoreline critical area and shoreline critical area buffer in compliance with this subsection N. The requirements of this subsection N may be modified through a critical areas report, LUC 20.25H.XXX.

1. New or Expanded Residential Moorage Facilities.

a. When Allowed. Construction of one noncommercial, residential moorage facility per upland residential waterfront lot or one joint-use moorage facility for two or more adjacent waterfront lots is allowed in accordance with this subsection N. Expansion of any legally established existing moorage facility is permitted only to the extent the expansion complies with the development standards of subsection b below, and does not cause the moorage facility to exceed, or further exceed, any of the limitations in subsection b.

Moorage shall only be permitted within:

i. Lots created on or after the effective date of this ordinance having water frontage meeting or exceeding the minimum lot width required in the applicable land use district;

ii. Lots created prior to the effective date of this ordinance; or

iii. Nonbuilding tracts platted for the purpose of providing common moorage for a group of contiguous properties.

For the purposes of meeting the requirements of subsection 1(a)(i) above, adjoining property owners may combine their water frontage by mutual agreement recorded with the King County Records and Elections Division and the Bellevue City Clerk. Only one moorage facility is permitted pursuant to such a combined frontage agreement, which may connect with the property landward of the ordinary high water mark at only one location.

b. Development Standards.

i. The only structures permitted in the first 30 feet waterward of the ordinary high water mark are piers and ramps. All floats and ells must be at least 30 feet waterward of the OHWM.

ii. No skirting is allowed on any structure.

iii. Surface Coverage (includes all overwater portions of the moorage structure):

(1) Moorage facilities serving only one residential waterfront lot shall not exceed 480 square feet.

(2) Moorage facilities serving two residential waterfront lots shall not exceed 700 square feet

(3) Moorage facilities serving three or more residential waterfront lots shall not exceed 1000 square feet.

iv. Location, width and length regulations. Docks with configurations that do not include any or all of the elements below shall be subject to the overall length and square footage limitations of this section. No portion of a dock shall exceed four feet in width, unless allowed in this subsection iv.

(1) Piers shall not exceed four feet wide and shall be fully grated.

(2) Ramps shall not exceed three feet wide and shall be fully grated.

(3) Ells.

(a) Ells are allowed only over water with depths of 9 feet or greater at the landward end of the ell.

(b) Ells may be up to six feet wide by 20 feet long with a two-foot wide strip of grating down the center; or

(c) Ells may be up to six feet wide by 26 feet long with grating over the entire ell.

(4) Floats.

(a) Floats are allowed only over water with depths of 10 feet or greater at the landward end of the float.

(b) Floats may be up to six feet wide by 20 feet long, with a two-foot wide strip of grating down the center.

(5) Total facility length. In no case may any moorage facility extend more than 150 feet waterward of the ordinary high water mark.

v. Structural Piling Specifications. The first (nearest shore) piling shall be steel, four inch piling and at least 18 feet waterward of the ordinary high water mark. Piling sets beyond the first are not required to be steel, shall be spaced at least 18 feet apart and shall not be greater than 12 inches in diameter. Piles shall not be treated with pentachlorophenol, creosote, CCA or comparably toxic compounds. If ACZA piling are proposed, the applicant will meet all of the Best Management Practices, including a post-treatment procedure, as outlined in the amended Best Management Practices of the Western Wood Preservers. Steel piles will be installed using approved sound attenuation measures.

vi. Mooring Pile Specifications. No more than two mooring piles may be driven for each moorage facility, including all existing mooring piles. Moorage piles shall be driven at least 30 feet waterward of the ordinary high water mark. Piles shall be located within at least 12 feet of any point on the moorage facility, and shall not be placed any further waterward

than the end of the moorage facility. Consistent with these specifications, mooring piles shall be as far offshore as possible.

vii. Shoreline Critical Area and Critical Area Buffer Functions.

(1) Existing habitat features. Existing habitat features (e.g., large and small woody debris, substrate material, etc.) shall be retained and new or expanded moorage facilities placed to avoid disturbance of such features.

(2) Invasive weeds (e.g., milfoil) may be removed with non-chemical means only.

(3) Shoreline Planting. In order to mitigate the impacts of new or expanded moorage facilities, the applicant shall plant emergent vegetation (if site appropriate) and a buffer of vegetation a minimum of 10 feet wide along the entire length of the lot immediately landward of ordinary high water mark. Planting shall consist of native shrubs and trees and, when possible, emergent vegetation. At least five native trees will be included in a planting plan containing one or more evergreen trees and two or more trees that like wet roots (e.g., willow species). Such planting shall be monitored for a period of five years consistent with a monitoring plan approved pursuant to LUC 20.25H.XXX.

viii. Setback. No private moorage or other structure waterward of the ordinary high water mark, including structures attached thereto, shall be closer than 12 feet to any adjacent property line except when a mutual agreement of adjoining property owners is recorded with the King County Records and Elections Division and the Bellevue City Clerk. Excepted from the requirements of this section are boat lifts or portions of boat lifts which do not exceed 30 inches in height measured from ordinary high water mark.

2. Repair and Replacement of Existing Residential Moorage Facilities.

a. Certain repairs requiring partial compliance with development standards. Proposals described in this subsection to repair legally established moorage facilities that do not meet the requirements of subsection 1 above trigger partial compliance with such requirements, as follows. A proposal includes any and all actions proposed within a twelve month period.

i. Proposals triggering partial compliance. The following proposals shall trigger the need for partial compliance with subsection 1. If a proposal triggers partial compliance, the applicant shall perform one of the improvements listed in subsection ii below.

(A) Proposals to replace more than 50% of the decking and the above-water decking substructure (e.g. stringers) within the first 30 feet waterward of the ordinary high water mark, or of the existing access ramp, whichever is less; or

(B) Proposals to replace more than 50% of the decking and decking substructure of the entire moorage; or

(C) Proposals involving the combination of either subsection (A) or (B) with a proposal to replace more than two but less than 50 percent of the existing piles.

ii. Improvements required. If the proposal triggers the need for partial compliance, the applicant may choose one of the following improvements. The improvement shall be completed with the original proposal:

(A) Reduce of the width of that portion of the facility within the first 30 feet waterward of the ordinary high water mark, or of any access ramp to no more than 4 feet wide; or

(B) Fully grate the affected portion of the facility; or

(C) Remove skirting from the entire facility; or

(D) Remove existing piles from the first 18 feet of the facility; or

(E) Enhance the shoreline critical area buffer to meet the shoreline plantings requirements of (1)(b)(vii)(3) above.

iii. Proposals involving replacement of moorage piles shall require full compliance of replacement moorage piles with the development standards of subsection 1(b)(vii) above.

iv. Proposals involving replacement of more than 50% of the structural piles of the moorage facility shall be considered a new moorage facility and shall comply with the provisions of subsection 1 above.

b. Other repairs. Proposals to repair existing legally established moorage facilities where the nature of the repair is not described in subsection 2.a shall be considered minor repairs and are permitted, consistent with any applicable standards of the Land Use Code, International Building Code, as adopted and subsequently amended by the City of Bellevue, and any other applicable codes or regulations.

3. New and Expanded Commercial, Public Access, Marina and Yacht Club Moorage.

a. When Allowed. New commercial moorage facilities for a water-dependent use, and new moorage for marinas and yacht clubs are allowed as a shoreline conditional use in accordance with this Paragraph N where the use has been legally established. Expansion of any legally established existing moorage facilities is permitted only to the extent the expansion complies with the development standards of subsection b below, and does not cause the moorage facility to exceed, or further exceed, any of the limitations in subsection b.

b. Development Standards.

i. The only structures permitted in the first 30 feet waterward of the ordinary high water mark are piers and ramps. All floats and ells must be at least 30 feet waterward of the OHWM.

ii. No skirting is allowed on any structure.

iii. Location, width and length regulations.

(1) Piers shall not exceed four feet wide and shall be fully grated.

(2) Ramps shall not exceed three feet wide and shall be fully grated.

(3) Ells.

(a) Ells are allowed only over water with depths of 9 feet or greater at the landward end of the ell.

(b) Ells may be up to six feet wide by 20 feet long with a two-foot wide strip of grating down the center; or

(c) Ells may be up to six feet wide by 26 feet long with grating over the entire ell.

(4) Floats.

(a) Floats are allowed only over water with depths of 10 feet or greater at the landward end of the float.

(b) Floats may be up to six feet wide by 20 feet long, with a two-foot wide strip of grating down the center.

(5) Total facility length. In no case may any moorage facility extend more than 150 feet waterward of the ordinary high water mark.

iv. Structural Piling Specifications. The first (nearest shore) piling shall be steel, four inch piling and at least 18 feet waterward of the ordinary high water mark. Piling sets beyond the first shall be spaced at least 18 feet apart and shall not be greater than 12 inches in diameter. Piles shall not be treated with pentachlorophenol, creosote, CCA or comparably toxic compounds. If ACZA piling are proposed, the applicant will meet all of the Best Management Practices, including a post-treatment procedure, as outlined in the amended Best Management Practices of the Western Wood Preservers. Steel piles will be installed using approved sound attenuation measures.

v. Mooring Pile Specifications. Moorage piles shall be driven at least 30 feet waterward of the ordinary high water mark. Piles shall be located within at least 12 feet of any point on the moorage facility, and shall not

be placed any further waterward than the end of the moorage facility. Consistent with these specifications, mooring piles shall be as far offshore as possible.

vi. **Setback**. No private moorage or other structure waterward of the ordinary high water mark, including structures attached thereto, shall be closer than 12 feet to any adjacent property line except when a mutual agreement of adjoining property owners is recorded with the King County Records and Elections Division and the Bellevue City Clerk. Excepted from the requirements of this section are boat lifts or portions of boat lifts which do not exceed 30 inches in height measured from ordinary high water mark.

vii. **Shoreline Critical Area and Critical Area Buffer Functions.**

(1) Existing habitat features. Existing habitat features (e.g., large and small woody debris, substrate material, etc.) shall be preserved and new or expanded moorage facilities placed to avoid disturbance of such features.

(2) Invasive weeds (e.g., milfoil) may be removed with non-chemical means only.

(3) Shoreline Planting. In order to mitigate the impacts of new or expanded moorage facilities, the applicant shall plant emergent vegetation (if site appropriate) and a buffer of vegetation a minimum of 10 feet wide along the entire length of the lot immediately landward of ordinary high water mark. Planting shall consist of native shrubs and trees and, when possible, emergent vegetation. At least five native trees will be included in a planting plan containing one or more evergreen trees and two or more trees that like wet roots (e.g., willow species). Such planting shall be monitored for a period of five years consistent with a monitoring plan approved pursuant to LUC 20.25H.XXX.

viii. Uncovered Commercial, Public Access, Marina or Yacht Club Moorage in Meydenbauer Bay. Commercial, public access, marina or yacht club moorage in Meydenbauer Bay shall not extend beyond the following boundary line: All Azimuths being South; commencing at the E 1/4 Sec. corner of Sec. 31 T 25N, R 5E, W.M., whose “X” coordinate is 1,661,520.58 and whose “Y” coordinate is 225,661.29 of the Washington Coordinate System, North Zone, and running thence on an Az of 78×51 17” a distance of 963.76 feet to a point whose coordinate is “X” 1,660,575.00, “Y” 225,475.00 of said coordinate system; thence on an Az of 37×26 00” for a distance of 60 feet to a point being the true beginning of this description; thence on an Az of 316×19 15” a distance of 495.14 feet; thence on an Az of 2×21 10” a distance of 42.52 feet; thence on an Az of 312×06 17” a distance of 415.00 feet; thence on an Az of 37×24 19” a distance of 118.06 feet to an intersection with the northwesterly extension of the northwesterly line of Reserve “A” at the N. end of Ronda Street between Blocks 29 and 38, Plat of Moorlands, as recorded in Vol. 4 of Plats, Page 103, records of King County,

Washington, said point of intersection being the terminus of this line description. (See Figure C.)

4. Repair and Replacement of Existing Commercial, Public Access, Marina and Yacht Club Moorage.

Any proposed repair or replacement of existing legally established moorage facilities shall comply to the maximum extent technically feasible with the standards for new facilities set forth in subsection 3 above. A determination of technical feasibility shall consider:

a. the location of existing infrastructure;

b. the function or objective of the proposed repair or replacement;

c. whether the cost of complying with the standards set forth in subsection 3 above is disproportionate as compared to the environmental benefit associated with such compliance; and

d. the ability of any impacts on the critical area functions and values of the shoreline arising from a repair or replacement that does not comply with the standards of subsection 3 above to be mitigated.

5. Boatlift. Installation, repair, maintenance, replacement or retention of one ground-based or floating watercraft lift without a canopy, per adjacent upland property and the placement of no more than 2 cubic yards of fill to anchor the lift is permitted.

a. The fill must be clean.

b. The fill must consist of rock or pre-cast concrete blocks.

c. The fill must only be used to anchor the watercraft lift.

d. The minimum amount of fill must be utilized to anchor the watercraft lift.

6. Covered Moorage. Installation of a translucent canopy on a new or existing watercraft lift is allowed in accordance with this subsection.

a. Number and Location -- Residential.

(1) In fresh waters, the canopy and structure should be located waterward of the 9’ depth elevation as established by chart datum. If this condition cannot be met, additional project impact reduction measures are required.

(2) The lowest edge of the canopy must be at least 8 feet above the plane of OHW.

(3) Only one canopy can be installed per single or joint use residential overwater structure.

(4) The watercraft lift with the canopy must be oriented with the length in the north-south direction to the maximum extent practicable.

b. Area Requirements, Covered Moorage -- Residential. The covered portion of a moorage shall be restricted to the area lying within an equilateral triangle, the base of which shall be a line drawn between the points of intersection of the property sidelines with the line of normal high water, except that covered moorage shall not extend beyond 100 feet from the center of the base of such triangle; the covered portion of such moorage shall be restricted to the area lying within an isosceles triangle of which the base is the line drawn between the points of intersection with the respective sidelines of such property and the line of normal high water with the vertex thereof 100 feet from the center of said base. The required 12-foot setback from the property sidelines shall be deducted from the triangle area. (See Figure A.)

Covered moorage in no event shall cover more than 50 percent of the permitted covered moorage area.

c. Area Requirements, Shared Covered Moorage -- Residential. Where a shared covered moorage is built pursuant to the agreement of adjoining owners, the covered moorage area shall be deemed to include, subject to the limitations of such joint agreement, all of the combined building areas included within the triangles extended upon said adjoining properties as augmented by the inverted triangle situated between the aforesaid triangles having as its base a line drawn between the vertices of the respective triangles. (See Figure B.) Covered moorage in no event shall cover more than 50 percent of the permitted covered moorage area.

d. Covered Commercial, Public Access, Marina or Yacht Club Moorage in Meydenbauer Bay. The extent of covered commercial, public access, marina or yacht club moorage in Meydenbauer Bay shall comply with the following limitations: On the common line of adjoining private properties, covered moorage shall observe a two-foot-six-inch setback; on public street lines, in the water, no setback shall be required; no covered moorage shall extend out in the bay farther than the limits of the following boundary line: All Azimuths being South; commencing at the E 1/4 Sec. corner of Sec. 31, T 25N, R 5E, W.M., whose “X” coordinate is 1,661,520.58 and whose “Y” coordinate is 225,661.29 of the Washington Coordinate System, North Zone, and running thence on an Az of 78×51 17” a distance of 963.76 feet to a point being the true beginning whose coordinate is “X” 1,660,575.00, “Y” 225,475.00 referred to said coordinate system; thence on an Az of 316×19 15” a distance of 999.87 feet; thence on an Az of 37×24 19” a distance of 217.23 feet to an intersection with the northwesterly extension of the northwesterly line of Reserve “A” at the N. end of Ronda Street between Blocks 29 and 38, Plats of Moorlands as recorded in Vol. 4 of Plats, page 103, records of King County, Washington, said point of intersection being the terminus of this line description. (See Figure C.)

7. Boathouses. New boathouses are prohibited. Existing boathouses are subject to the rules for existing non-primary structures, other than primary structures, set forth in LUC 20.25E.050.C.1 or C.2, as applicable.

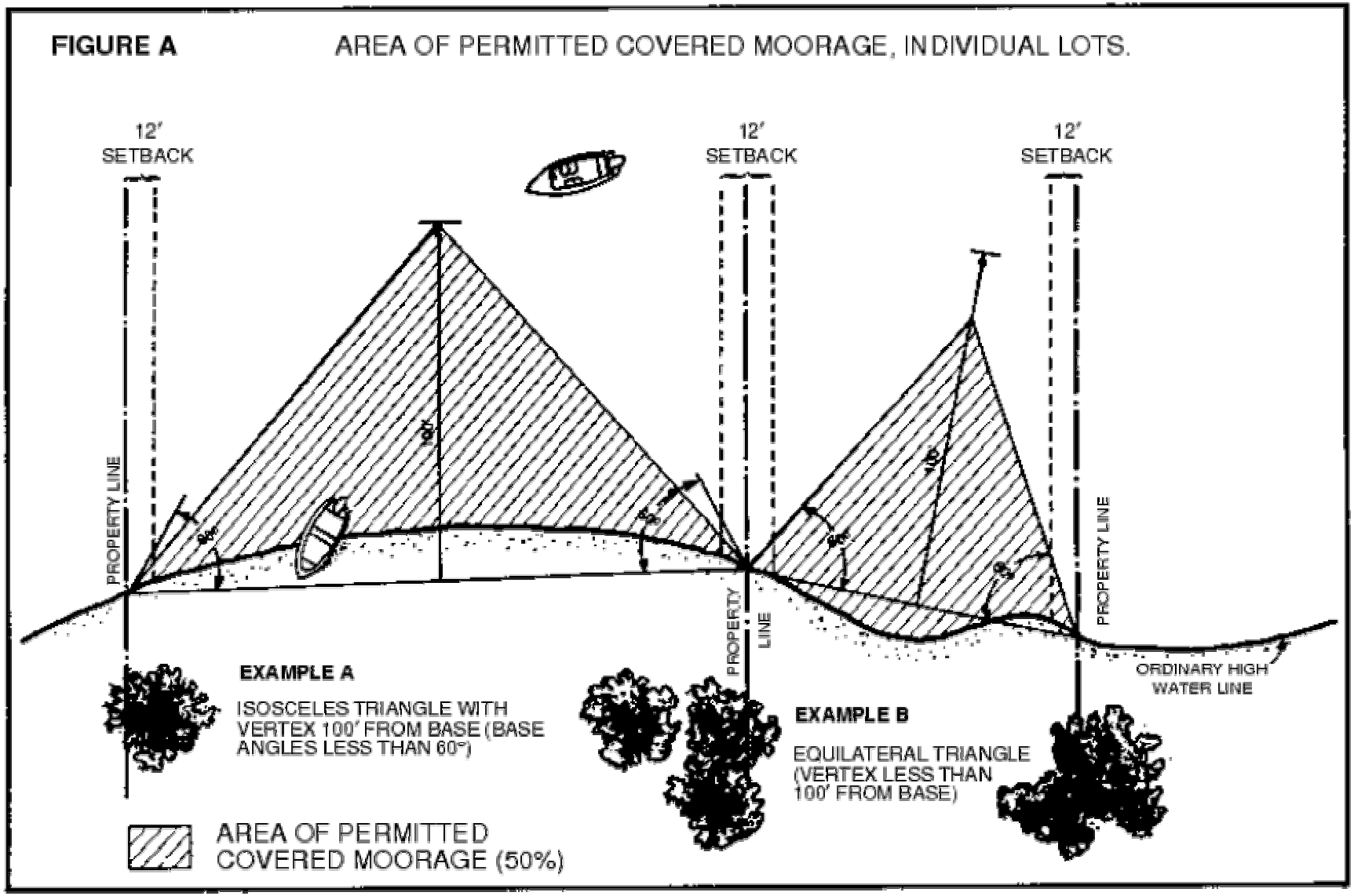
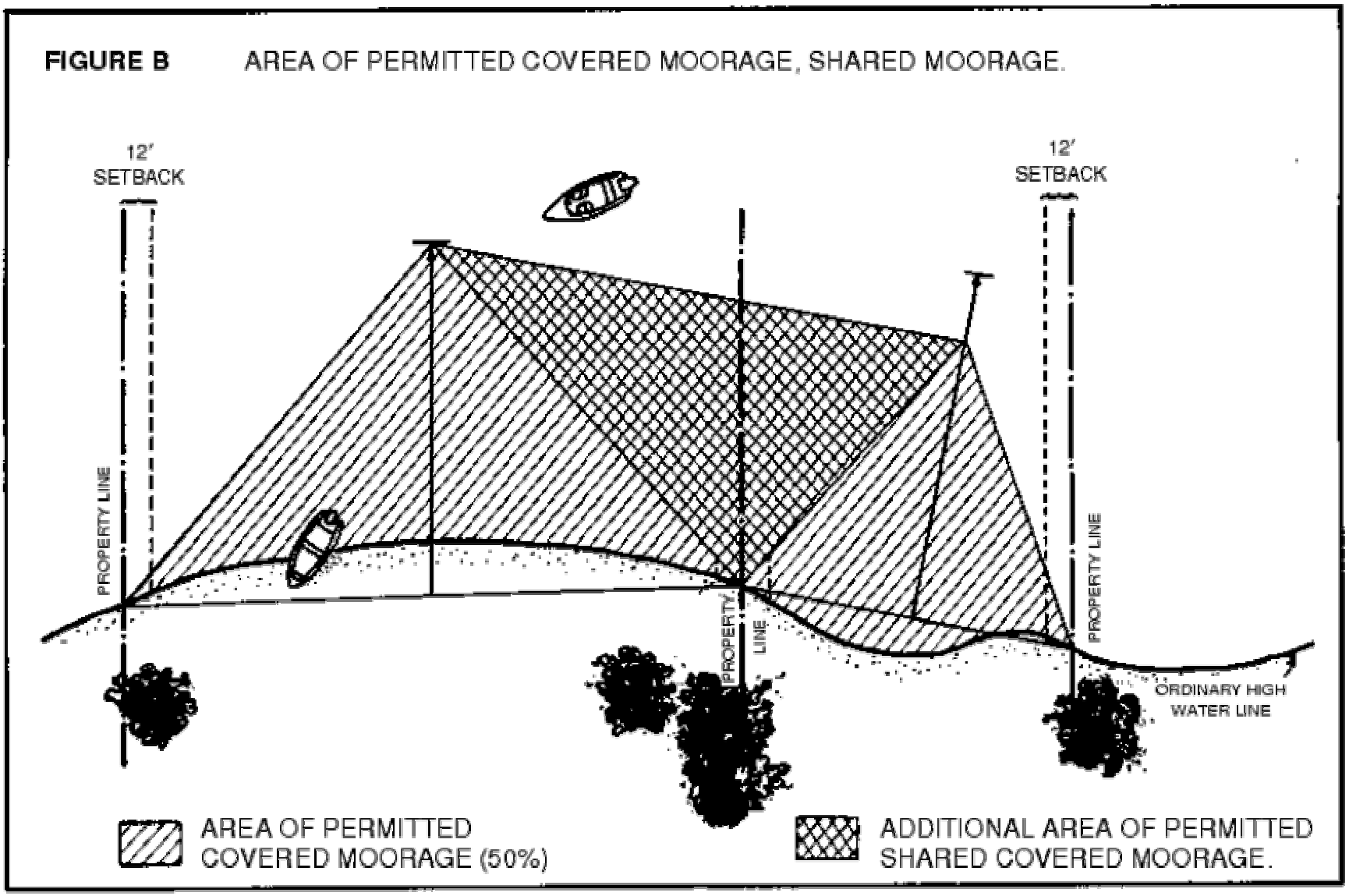


FIGURE A
AREA OF PERMITTED COVERED MOORAGE, INDIVIDUAL LOTS.
12′ SETBACK
12′ SETBACK
12′ SETBACK
PROPERTY LINE
PROPERTY LINE
PROPERTY LINE
ORDINARY HIGH WATER LINE
EXAMPLE A
ISOSCELES TRIANGLE WITH VERTEX 100′ FROM BASE (BASE ANGLES LESS THAN 60°)
EXAMPLE B
EQUILATERAL TRIANGLE (VERTEX LESS THAN 100′ FROM BASE)
AREA OF PERMITTED COVERED MOORAGE (50%)

FIGURE B AREA OF PERMITTED COVERED MOORAGE, SHARED MOORAGE.



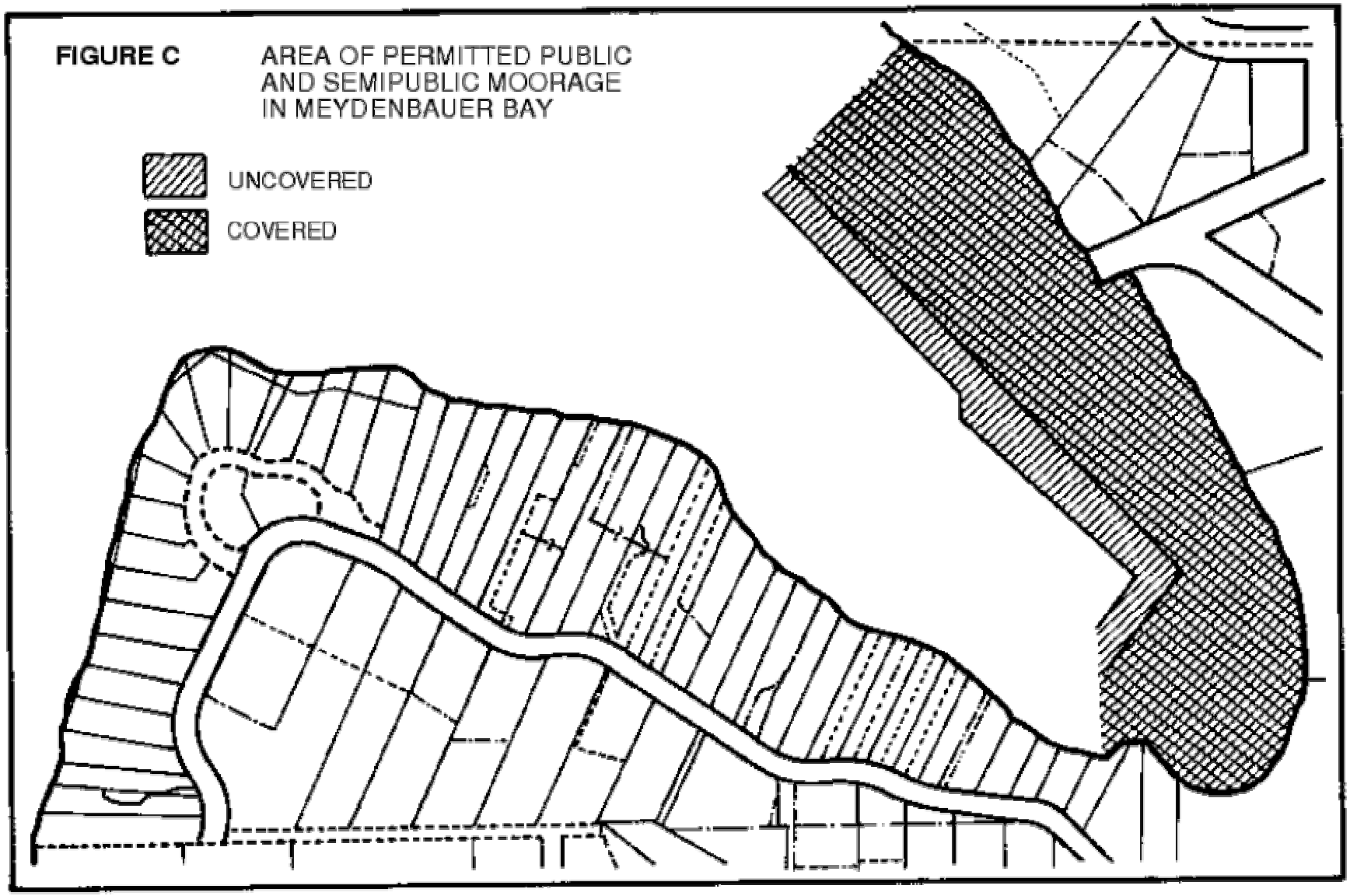


FIGURE C
AREA OF PERMITTED PUBLIC AND SEMIPUBLIC MOORAGE IN MEYDENBAUER BAY
UNCOVERED
COVERED

O. Ports and water-related industries are not a permitted use within the Shoreline Overlay District.

P. Recreation Activities Regulations.

1. Swimming shall be separated from public or semipublic boat launching area.

2. Public street ends in the Shoreline Overlay District may be developed for public recreational activities.

3. Recreational activities within the Shoreline Overlay District shall be permitted when designed subject to the provisions of the Bellevue Shoreline Master Program and its use regulations.

4. Recreation activities, whether public or private, proposed or located in the shoreline critical area and shoreline critical area buffer shall comply with the requirements of LUC 20.25H.060 (existing activities) or LUC 20.25H.070.C.9 (new activities).

Q. Residential Development Regulations.

1. For purposes of this section, accessory structures shall include swimming pools, tennis courts, spas, greenhouses and similar facilities.

2. No boat, houseboat or watercraft moored seaward of the ordinary high water mark shall be used as a permanent residence.

3. All structures, accessory buildings and ancillary facilities, other than those related to water use (such as moorage) shall be located outside of the shoreline critical area and shoreline critical area buffer, except stairs, handrails, and a trail or path providing access to the shoreline. The requirements of this subsection may be modified through a critical areas report, LUC 20.25H.XXX, or through participation in the stewardship program described in LUC 20.25H.070.

4. Maximum building height in those areas of the Shoreline Overlay District which are zoned for residential uses shall be 35 feet, except in land use districts where more restrictive height limitations exist.

6. All residential development shall be accompanied by a plan indicating methods for preserving shoreline vegetation and control of erosion during and following construction as required by City of Bellevue clearing and grading regulations, Chapter 23.76 BCC, and the Comprehensive Plan.

R. Road and Railroad Designs and Construction Regulations.

1. Construction of new railroad corridors in the Shoreline Overlay District is prohibited. Repair and reconstruction of existing facilities is permitted.

2. Development of pedestrian and bicycle pathways within the Shoreline Overlay District shall avoid those areas which are too fragile for normal trail construction.

When development design is shown to mitigate adverse impact, it may be permitted.

3. New parking facilities within the Shoreline Overlay District shall not be permitted over water or within the shoreline critical area buffer. Provisions must be made to control and cleanse surface water runoff from parking areas in order to comply with state water quality standards.

4. Parking facilities shall be set back a sufficient distance from the ordinary high water mark so as not to require the creation or protection of such parking facilities by shoreline protective measures.

5. Roads, railroads and trails proposed or located in the shoreline critical area and shoreline critical area buffer shall comply with the requirements of LUC 20.25H.XXX.

T. Solid Waste Regulations.

1. The disposal of nuisance materials, as defined by the City of Bellevue Nuisance Ordinance, Chapter 9.10 BCC, within the Shoreline Overlay District is prohibited.

2. The dumping of toxic materials within the Shoreline Overlay District is prohibited.

U. Utilities Regulations.

1. Compatible utilities shall be consolidated within a single right-of-way. After construction, all areas shall be restored to their pre-project configuration, replanted with suitable vegetation, and provided maintenance until newly planted vegetation is established.

2. Utilities proposed or located in the shoreline critical area and shoreline critical area buffer shall comply with the requirements of LUC 20.25H.XXX.

EPF/existing landscape maintenance/vegetation management/

V. Variances – Special Procedures.

Where there is a Shoreline Overlay District, variances from the requirements of the underlying use district regulations will follow the requirements and procedures specified in Part 20.30G LUC. A variance from the Shoreline Master Program will not be required in addition to the variance from the requirements of the underlying use district unless the proposal would constitute a variance from the Shoreline Master Program. Where the variance sought is from the requirements of the Shoreline Master Program, the procedures and requirements specified in Part 20.30H LUC will be followed.

W. Conditional Uses – Special Procedures.

Uses which are shown as Conditional Uses on Chart 20.10.440 for the underlying use district shall, where there is also a Shoreline Overlay classification on the property, follow the requirements and procedures of Part 20.30C LUC.

X. Administration and Enforcement.

The administration and enforcement of this section shall be in conformance with the rules and procedures set forth in Chapter 20.40 LUC and with those found in WAC 173-14-180 or its successor. When conflict arises between regulations of the Shoreline District and underlying land use districts, regulations of the Shoreline Overlay District shall prevail.

Section 11. This ordinance shall take effect on December 1, 2005.

PASSED by the City Council this _____ day of _____, 2005, and signed in authentication of its passage this _____ day of _____, 2005.

(SEAL)

Connie B. Marshall, Mayor

Approved as to form:

Lori M. Riordan, City Attorney

Attest:

Myrna L. Basich, City Clerk

Published

General LUC Amendments

CITY OF BELLEVUE, WASHINGTON
ORDINANCE NO. _____

AN ORDINANCE amending the Bellevue Land Use Code to adopt city-wide impervious surface standards, and amend cross references, administrative provisions, and other sections for consistency with the Critical Areas Update; amending Sections 20.20.005, 20.20.010, 20.20.017, 20.20.018, 20.20.025, 20.20.030, 20.20.450, 20.20.520, 20.20.525, 20.20.540, 20.20.560, 20.20.590, 20.20.730, 20.25B.040, 20.25C.040, 20.25K.040, 20.25L.010, 20.25L.030, 20.30G.140, 20.35.015, 20.35.210, 20.50.020, 20.50.026, 20.50.040; repealing Section 20.20.023 and Part 20.30P; and creating new Sections 20.20.460, 20.50.042 and a new Part 20.30P of the Bellevue Land Use Code; and establishing an effective date.

WHEREAS, [insert a number of whereas clauses that describe why the City is processing the amendment based on BAS, public testimony and Comprehensive Plan]; and

WHEREAS, the Planning Commission held a public hearing on July 6, 2005 with regard to such proposed Land Use Code amendment; and

WHEREAS, the Planning Commission recommends that the City Council approve such proposed amendment; and

WHEREAS, the City of Bellevue has complied with the State Environmental Policy Act (SEPA), Chapter 43.21C RCW, and the City's Environmental Procedures Code, BCC 22.02; now, therefore,

THE CITY COUNCIL OF THE CITY OF BELLEVUE, WASHINGTON, DOES ORDAIN AS FOLLOWS:

Section 1. Section 20.20.005 of the Bellevue Land Use Code is hereby amended as follows:

20.20.005 Chart of dimensional requirements described.

Chart 20.20.010 sets forth the dimensional requirements for each land use district except: the Downtown Land Use Districts, the Evergreen Highlands Design District, the Evergreen Highlands Subarea Transportation Improvement Overlay District, Institutional District, and the OLB-OS Land Use District. All structures and activities in the City not located in the above districts shall conform to the dimensional requirements in Chart 20.20.010. Dimensional requirements for the Downtown Land Use Districts are found in LUC 20.25A.020. Dimensional requirements for the Evergreen Highlands Design District are found in Part 20.25F. Dimensional requirements for the Evergreen Highlands Subarea Transportation Improvement Overlay District are found in Part 20.25G.

Dimensional requirements for the Medical Institutional District are found in Part 20.25J. Dimensional requirements for the OLB-OS Land Use District are found in LUC 20.25L.030. Additional special dimensional requirements for designated areas of the City are contained in other parts of the Code as follows:

A. Part 20.25B LUC – Transition Areas;

B. Part 20.25C LUC – OLB Districts;

C. Part 20.25E LUC – Shoreline Overlay District;

D. Part 20.25H LUC – Critical Areas Overlay District;

E. Part 20.45A LUC – Platting and Subdivisions;

F. Part 20.45B LUC – Short Plats and Short Subdivisions.

Section 2. Section 20.20.010 of the Bellevue Land Use Code is hereby amended as follows:

20.20.010 Uses in land use districts dimensional requirements.

Chart 20.20.010

Uses in land use districts **Dimensional Requirements**

STD LAND USE CODE REF		Residential										
	LAND USE CLASSIFICATION	R-1	R-1.8	R-2.5	R-3.5	R-4	R-5	R-7.5*	R-10	R-15	R-20	R-30
	DIMENSIONS											
	Minimum Setbacks of Structures (feet) Front Yard (18) (20) (38) (39)	35	30	20	20	20	20	20	20	20	20	20
	Rear Yard (11) (17) (18) (20) (38) (39)	25	25	25	25	20	20	20	25	25	25	25
	Side Yard (11) (17) (18) (20) (38) (39)	5	5	5	5	5	5	5	5	5	5	5(1)
	2 Side Yards (17) (18) (20) (38) (39)	20	15	15	15	15	15	10	15	15	15	15
	Minimum Lot Area Acres (A) or Thousands of Sq. Ft. (3) (39)	35	20	13.5	10	8.5	7.2	4.7	8.5	8.5	8.5(12)	8.5(12)
	Dwelling Units per Acre (15) (21) (22)	1	1.8	2.5	3.5	4	5	7.5	10	15	20	30
	Minimum Dimensions (feet) Width of Street Frontage	30	30	30	30	30	30	30	30	30	30	30
	Width Required in Lot (4)	100	90	80	70	65	60	50	70	70	70	70

	Depth Required in Lot (4)	150	80	80	80	80	80	80	80	80	80	80
	Maximum in Building Height (feet) (10) (19) (26)	30	30	30	30	30	30	30	30	30	30 (5)	40
	Maximum Lot Coverage by Structures (percent) (13) (14) (16) (26) (27) (37) (39)	35	35	35	35	35	40	40	35	35	35	35
	Maximum Impervious Surface (percent) (35) (37) (39)	50 (36)	50 (36)	50 (36)	50 (36)	50 (36)	55 (36)	55 (36)	80	80	80	80

**Not effective within the jurisdiction of the East Bellevue Community Council.*

NOTE: Dimensional Requirements for Downtown are found in Part 20.25A LUC.

Dimensional Requirements for Evergreen Highlands Design District (EH-A, EH-B, EH-C, EH-D) are found in Part 20.25F LUC.

Dimensional Requirements for Office and Limited Business – Open Space (OLB-OS) are found in Part 20.25L LUC.

Dimensional Requirements for Medical Institution District (MI) are found in Part 20.25J LUC.

20.20.010

Chart 20.20.010 [Reader Note: the columns of this table for the Downtown land use districts have not been reprinted here for formatting reasons; they are not impacted by this ordinance]

	Professional Office	Office	Office/Limited Business	Light Industry	General Commercial	Neighborhood Business	Community Business	Factoria Land Use District 1	Factoria Land Use District 2	Factoria Land Use District 3
LAND USE CLASSIFICATION	**PO**	**O**	**OLB**	**LI**	**GC**	**NB**	**CB**	**F1**	**F2**	**F3**
DIMENSIONS	(8, 21)	(8, 21)	(8, 21)	(8, 21)	(8, 21)	(8, 21)	(8, 21)	(8, 21)	(21, 31)	(21, 32)
Minimum Setbacks of Structures (feet) Front Yard (18) (20)	30	30	50	15	15			(28)	50	20
Rear Yard (17) (18) (20)	25	25	50	(2)	(2)	(2)	(2)	(2, 28)	30	5
Side Yard (17) (18) (20)	20	20	30	(2)	(2)	(2)	(2)	(2, 28)	30	5
2 Side Yards (17) (18) (20)	40	40	60	(2)	(2)	(2)	(2)	(2, 28)	60	10
Minimum Lot Area Acres (A) or Thousands of Sq. Ft. (3)			2A						2A	2A
Dwelling Units per Acre (15) (22)	10 (23)	20 (23)	30 (23)			15 (23)	30 (23)	30 (23)	30 (23)	30 (23)
Minimum Dimensions (feet) Width of Street Frontage			200						200	200
Width Required in Lot (4)			200						200	200
Depth Required in Lot (4)										
Maximum in Building Height (feet) (10) (19)	20	30	45 (6)	45 (9)	30	20 (25)	45	45/60 (29, 30)	75	75/135 (33, 34)
Maximum Lot Coverage by Structures (percent) (13) (14) (16) (37)	35 (24)	35 (24)	35 (24)	50		35 (24)			35 (24)	35 (24)
Maximum Impervious Surface (percent) (35) (37)	80	80	80	85	85	80	85	85	80	80

**Not effective within the jurisdiction of the East Bellevue Community Council.*

NOTE: Dimensional Requirements for Downtown are found in Part 20.25A LUC.
Dimensional Requirements for Evergreen Highlands Design District (EH-A, EH-B, EH-C, EH-D) are found in Part 20.25F LUC.
Dimensional Requirements for Office and Limited Business – Open Space (OLB-OS) are found in Part 20.25L LUC.
Dimensional Requirements for Institutional District (I) are found in Part 20.25J LUC.

Notes: Uses in land use districts – Dimensional requirements

(1) Side yard setback in R-30 Districts increases to 20 feet on any side yard where structure exceeds 30 feet above finished grade.

(2) All rear and side yards shall contain landscaping as required by LUC 20.20.520.

(3) See LUC 20.20.012.

(4) See LUC 20.20.015.

(5) Except in Transition Areas, the maximum allowable building height in R-20 Districts may be increased to 40 feet if ground floor or underground parking for that building is provided and occupies a minimum of 75 percent of the building footprint.

(6) The maximum allowable building height is 75 feet on any property designated OLB which lies within 475 feet of the right-of-way of I-405, between I-90 and SR-520.

(7) Dimensional requirements for Downtown Land Use Districts are listed in LUC 20.25A.020.

(8) Any office building or any office portion of a building in the PO, O, OLB, LI, GC, NB, CB or F1 Districts shall comply with the following limitations on Floor Area Ratio:

(a) At 0.5 FAR, no office building or office portion of a building may exceed 50,000 square feet of gross floor area; and

(b) For any office building or office portion of a building greater than 50,000 square feet in gross floor area the following sliding scale shall be observed as interpolated and extrapolated below:

(i) At 0.3 FAR, no office building or office portion of a building may exceed 100,000 square feet of gross floor area; and

(ii) At 0.1 FAR, no office building or office portion of a building may exceed 150,000 square feet of gross floor area.

This footnote 8 shall not apply to sites in the critical areas overlay district. Density/intensity on sites in the critical areas overlay district is calculated pursuant to LUC 20.25H.045.

*(9) The maximum building height may be exceeded upon approval of the Director of Planning and Community Development. Requests for such approval shall be processed in accordance with the administrative conditional use procedure of Part 20.30E LUC. Before granting any such approval, the Director of Planning and Community Development must find that:

(a) The height increase is only to accommodate equipment, structures or buildings that contain special equipment primarily related to light manufacturing, wholesale, trade and distribution use, and is not for office or bulk retail use; and

(b) There is functional need for a height increase; and

(c) The overall site development will minimize adverse impacts caused by the height increase.

Notwithstanding the provisions of this note, no height increase is permitted within a Transition Area as defined in Part 20.25B LUC.

**Not effective within the jurisdiction of the East Bellevue Community Council. The maximum building height in LI Districts shall remain 30 feet.*

*(10) Except in Transition Areas, the allowable building height of any building located in PO, O, OLB, GC, NB, or CB Districts may be increased by one story, but not to exceed 15 feet, if basement parking for that building occupies a minimum of 75 percent of the building footprint.

** Not effective within the jurisdiction of the East Bellevue Community Council. The maximum building height in the LI Districts shall remain 30 feet.*

(11) The LUC contains enhanced setback requirements for churches, clubs, and institutions (refer to LUC 20.20.190) and schools (refer to LUC 20.20.740) located in residential land use districts.

(12) For each square foot of lot area devoted to open space in excess of 30 percent of the total lot area, one square foot is added to the lot area for the purpose of calculating density.

(13) Lot coverage is calculated after subtracting all critical areas, and stream critical area buffers, as designated in Part 20.25H..

(14) Maximum lot coverage by structures is determined after public right-of-way and private roads are subtracted from the gross land area.

(15) Except for sites in the critical areas overlay district, if there is a conflict between the minimum lot area and the permitted number of dwelling units per acre, the minimum lot area controls. Density/intensity on sites in the critical areas overlay district is calculated pursuant to LUC 20.25H.045

(16) Exceptions to Lot Coverage. Although not considered structures for purposes of calculating lot coverage, the following may be considered impervious surfaces subject to the impervious surface limits. See LUC 20.20.460 and 20.50.026.

(a) Underground buildings as defined in LUC 20.50.050 are not structures for the purpose of calculating lot coverage.

(b) Buildings constructed partially below grade and not higher than 30 inches above existing or finished grade, whichever is lower, are not structures for the purpose of calculating lot coverage subject to the following conditions:

(i) The 30-inch height limit must be met at all points along the building excluding those areas necessary to provide reasonable ingress and egress to the underground portions of the building; and

(ii) The rooftop of the building shall be screened from abutting properties with 10 feet of Type II landscaping as described in LUC 20.20.520.G.2 except that the required trees shall be a minimum of 10 feet in height at planting; or, if a use is proposed for the rooftop, the rooftop may be landscaped consistent with the planting requirements for the specific use that is proposed and for the land use district in which the use is located. All landscaping shall comply with standards set forth in LUC 20.20.520. The provisions of LUC 20.20.520.J (Alternative Landscaping Option) are applicable.

(17) If the setback abuts a street right-of-way, access easement or private road, the minimum dimension is 10 feet unless a greater dimension is specified.

(18) See LUC 20.20.030 for designation and measurement of setbacks.

*(19) Notwithstanding any other provision of this Code, except Part 20.25B LUC or LUC 20.20.900 through 20.20.910, as applicable, the allowable building height of an office building may be increased by one story, not to exceed 15 feet, if a minimum of 75 percent of the ground floor of that building is devoted to parking for that building.

**Effective only within East Bellevue Community Council jurisdiction.*

(20) See LUC 20.25H.035 for additional critical area setbacks.

(21) See LUC 20.25H.045 for calculation of density/intensity on sites in the critical areas overlay district.

(22) Density for senior citizen dwelling, congregate care senior housing, and assisted living is calculated as follows: units less than 600 square feet count as 0.5 unit and units 600 square feet or greater count as one unit.

(23) This residential density may be in addition to FAR only for senior citizen dwellings, assisted living and congregate care senior housing.

(24) Lot coverage may be increased to 50 percent if congregate care senior housing, senior citizen dwellings, assisted living or nursing homes are constructed on-site; provided, however, that coverage for the nonresidential portions of the development cannot exceed the maximum limits indicated. Lot coverage within NB Districts may be increased to 50 percent for mixed use development which includes residential uses comprising at least one-half the square footage of the building footprint. Underground parking in excess of 50 percent of the site area shall not be included in lot coverage calculations.

(25) The maximum building height for structures is increased to 30 feet only if residential uses or administrative office uses are provided on the second floor and provided the structure does not exceed two stories. For purposes of this note, a story is defined pursuant to the International Building Code, Section 202, as adopted and amended by the City of Bellevue.

(26) See LUC 20.20.125 for specific requirements applicable to detached accessory structures.

(27) Lot coverage for schools located in residential land use districts is limited to 35 percent of the site area (refer to LUC 20.20.740).

(28) A 15-foot setback from the right-of-way line of Factoria Boulevard is required for development in the F1 Land Use District. A 15-foot setback from the right-of-way line of SE 38th Street between Factoria Boulevard and 126th Avenue SE is required for development in the F1 Land Use District.

(29) Maximum building height in the F1 Land Use District shall be measured from average existing grade. Maximum building height in Area II and Area III of the F1 Land Use District is 60 feet, measured from average existing grade.

(30) The allowable maximum building height of any building located in the F1 Land Use District may be increased by one story, not to exceed 15 feet, if a minimum of 75 percent of the ground floor of that building is devoted to parking. In no event shall a building in Area II or Area III of the F1 District exceed 75 feet, as measured to the highest point of the structure from average existing grade, including pitched roof areas and penthouse equipment screening.

(31) Any office building or any office portion of a building in the F2 District may not exceed a Floor Area Ratio of 0.6 FAR.

(32) The maximum FAR for the combined properties in the F3 Land Use District, regardless of use, shall be 1.26 FAR; provided, that individual parcels or portions of property lying within the F3 Land Use District may have FAR for those individual parcels or portions which exceed an FAR of 1.26 provided that the FAR calculated for the entire aggregated property within the F3 Land Use District shall not exceed 1.26. The maximum FAR permitted herein is based on a maximum total development, including existing and new development of 950,000 square feet, calculated in the same manner as provided for in the calculation of FAR. In the event of an inconsistency between the FAR maximum of 1.26 and the maximum total development amount of 950,000 square feet, the latter shall control.

(33) In no event shall building height exceed 324 feet above sea level, based on North American Vertical Datum, 1988 (NAVD – 88).

(34) Maximum building height south of the F3 Land Use District Separation Line shall be 135 feet, with structural elements not intended for habitation above 135 feet, so long as structural elements do not exceed 275 feet above sea level based on NAVD – 88.

(35) See LUC 20.20.460 for exceptions and performance standards relating to impervious surface.

(36) Impervious surface limits for legally-established nonconforming non-residential uses and for new allowed non-residential uses in these residential land use districts shall be 80 percent.

(37) Maximum impervious surface and maximum lot coverage by structures are independent limitations on allowed development. All areas of lot coverage by

structures is included in the calculation of total maximum impervious surface, unless such structures is excepted under LUC 20.20.460.

(38) Certain non-critical area setbacks on sites in the critical areas overlay district may be modified pursuant to LUC 20.25H.040.

(39) These dimensional standards may be modified through an approved conservation subdivision, LUC 20.45A.060 or conservation short subdivision, LUC 20.45B.055.

Section 3. Section 20.20.017 of the Bellevue Land Use Code is hereby amended as follows:

20.20.017 Minimum lot size – Averaging in short plats and subdivisions.

In approved short plats and subdivisions, the individual lots shall be considered in compliance with minimum area requirements if the average of the areas of all the lots in the short plat or plat meets the minimum requirement for the district in which the short plat or plat is located, provided: (1) that no individual lot therein shall be reduced more than 10 percent from the district minimum required area, except that lots in zones R-1, R-1.8, R-2.5, and R-3.5 may be reduced by up to 15 percent from the district minimum; (2) a reduction of five percent in the required lot width may be applied to 20 percent of the lots provided no reduction in the required area is applied to these lots. The lot averaging described in this section shall not be allowed for conservation subdivisions or conservation short subdivisions where the required minimum lot size for such subdivision is reduced as allowed under LUC 20.45A.060 or 20.45B.055, as applicable.

Section 4. Section 20.20.018 of the Bellevue Land Use Code is hereby amended as follows:

20.20.018 Variation in minimum requirements – Area, width and depth.

Except as set forth in LUC 20.20.017 above, in no case may the Director or any other hearing body vary the minimum requirements for minimum lot area, width of street frontage, width required in lot or depth required in lot, as stated in Chart 20.20.010, by more than 10 percent; except that this section shall not apply to planned unit developments, Part 20.30D LUC, conservation subdivisions, LUC 20.45A.060, or conservation short subdivisions, LUC 20.45B.055. See Part 20.30G LUC relating to variances from the Land Use Code and Part 20.30H LUC relating to variances from the Shoreline Master Program.

Section 5. Section 20.20.023 of the Bellevue Land Use Code is hereby deleted in its entirety as follows:

Section 6. Section 20.20.025 of the Bellevue Land Use Code is hereby amended as follows:

20.20.025 Intrusions into required setbacks.

A. Signs, Marquees and Awnings.

See Sign Code, Chapter 22B.10 BCC.

B. Garages/Carports on Slopes.

1. If the topography of a lot is such that there is no reasonable way to construct a driveway with a slope less than 15 percent to the dwelling level, a garage/carport may be built in the front yard setback, LUC 20.20.010, subject to approval by the Director of Planning and Community Development. The garage/carport must be set at least five feet back from the front lot line, and may not exceed 15 feet above street level measured to the peak of a pitched roof or nine feet above street level measured to the top of a flat roof. The garage/carport and its vehicular access must be located and oriented to minimize disturbance of the slope.

2. A garage/carport must comply with the street intersection sight obstruction requirements of BCC 14.60.240.

3. A garage/carport may not be located within a critical area or critical area buffer unless allowed under Part 20.25H.

C. Minor Building Elements.

Subject to LUC 20.20.025.C.3, minor building elements including patios, platforms, eaves, trellises, open beams, fireplace chimneys, decks, porches, balconies, lanais, bay windows, greenhouse windows and similar elements of a minor character may intrude into a required setback as follows:

1. Any portion of a minor building element which equals or exceeds 30 inches above finished grade at its location may intrude into a required setback a distance no greater than 20 percent of the minimum dimension of that setback, or at least 18 inches, whichever is greater.

2. Any portion of a minor building element which is less than 30 inches above finished grade at its location may extend to any lot line.

3. Except for eaves, the combined length of all minor building elements which equal or exceed 30 inches above finished grade on any building facade shall not exceed 25 percent of the length of that facade.

4. Minor building elements may not be used to extend the enclosed building floor area into the required setback, except chimneys and bay windows protruding no more than 18 inches into the setback may extend to the finished grade at their location.

5. A minor building element may extend into a critical area structure setback required by LUC 20.25H.035 only if it is above the ground level and if vegetation will be maintained in a healthy condition. Solar access to vegetation must be maintained at least 50 percent of daylight hours during the normal growing season.

Note: Heat pumps are not minor building elements. Retaining walls and rockeries 30 inches or greater in height are not minor building elements.

D. Rockeries and Retaining Walls.

On a lot of less than 30,000 gross square feet or on any single-family lot, rockeries and retaining walls 30 inches or greater in height may extend into setbacks established by LUC 20.20.010; provided, that the existing grade change is such that no feasible alternative to location or height exists. In any event, the critical area buffer and structure setbacks of LUC 20.25H.035 apply.

E. Underground Buildings and Buildings Constructed Partially Below Grade.

1. Limitations. This paragraph cannot be used to develop any building (including an underground building) which intrudes into critical areas, critical area buffers, or critical area structure setbacks required by LUC Part 20.25H.

2. Subject to the limitations contained in this paragraph, underground buildings may intrude in the required setback.

3. Subject to the limitations contained in this paragraph, buildings constructed partially below grade and not higher than 30 inches above existing or finished grade, whichever is lower, may intrude into required setbacks subject to the following conditions:

   a. The 30-inch height limit must be met at all points along the building except those areas necessary to provide reasonable ingress and egress to the underground portions of the building; and

   b. The rooftop of the building shall be screened from abutting properties with 10 feet of Type II landscaping as described in LUC 20.20.520.G.2 except that the required trees shall be a minimum of 10 feet in height at planting or, if a use is proposed for the rooftop, the rooftop may be landscaped consistent with the planting requirements for the specific use that is proposed and for the land use district in which the use is located. All landscaping shall comply with standards set forth in LUC 20.20.520. The provisions of LUC 20.20.520.J (Alternative Landscaping Option) are applicable.

Section 7. Section 20.20.030.E of the Bellevue Land Use Code is hereby amended as follows:

E. The critical area buffer and critical area structure setback requirements of LUC Part 20.25H are in addition to the setback requirements of LUC 20.20.010 and 20.25A.020. The greater setback dimension is required.

Section 8. Section 20.20.450.A.1 of the Bellevue Land Use Code is hereby amended as follows:

A. Heliports – General Requirements.

1. In addition to the decision criteria in LUC 20.30B.140, the City shall consider, but not be limited to, the following criteria, in deciding whether to approve or approve with modifications an application for a heliport Conditional Use Permit:

a. In consideration of identified noise impacts, the City may impose conditions restricting the type of aircraft permitted to land at an approved heliport, and conditions which limit the number of daily takeoffs and landings and hours of operation.

b. The City may impose a periodic review requirement on heliport conditional use approvals in order to consider imposing additional conditions to mitigate adverse impacts from new aircraft technology.

c. The City may consider whether approach and departure paths are obstruction-free and whether residential or critical areas would be adversely affected. The City may also consider whether approach and departure paths abut freeway corridors or waterways.

d. The City may consider whether the proposed heliport facility will participate in a voluntary noise reduction program such as the "Fly Neighborly Program."

Section 9. A new Section 20.20.460 is hereby added to the Bellevue Land Use Code as follows:

20.20.460 Impervious Surface

A. Purpose. Limits on the total amount of impervious surfaces associated with site development are desirable to protect critical areas, which are impacted by the increased levels and rates of surface flow generated by impervious surfaces.

B. Applicability. The impervious surface limits contained in LUC 20.20.010, and the standards of this section shall be imposed any time a permit, approval, or review including land alteration or land development including subdivisions, short subdivisions or planned unit developments, a change in lot coverage, or a change in the area devoted to parking and circulation is required by this Code, or by the International Building Code.

C. Modifications to Impervious Surface Limits. The impervious surface limits contained in LUC 20.20.010 may be modified pursuant to a critical areas report, LUC 20.25H.XXX, so long as the critical areas report demonstrates that the effective impervious surface on the site does not exceed the limit established in 20.20.010.

D. Exceptions. The following are exempted from determining maximum impervious surface. These exemptions do not apply to any other Land Use Code requirement, including setbacks and limits on maximum lot coverage by structure; building code, utilities code or other applicable City of Bellevue codes or regulations.

1. Decks/platforms. Decks and platforms constructed with gaps measuring 1/8 inch or greater between boards, so long as the surface below the deck or platform is pervious;

2. Rockeries/retaining walls. Rockeries and retaining walls shall be exempt from the maximum impervious surface limits;

3. Stabilization measures. Shoreline stabilization measures shall be exempt from the maximum impervious surface limits; and

4. Landscape features. Fences, arbors with lattice or open roof materials and similar structures, individual stepping stones placed in the ground by not cemented or held together with an impervious material, and gravel mulch shall be exempt from the maximum impervious surface limits.

E. Performance Standards.

1. Design shall minimize topographic modification. Structures shall conform to the natural contour of the slope. The foundation shall be tiered to conform to the existing topography and step down the slope with earth retention incorporated into the structure where feasible. Standard prepared building pads, i.e., slab on grade shall be avoided; and

2. Garages on sites sloping uphill should be placed below the main floor elevation where feasible to reduce grading and to fit structures into existing topography. Garages on sites sloping downhill from the street may be required to be placed as close to the right-of-way as feasible and at or near street grade. Intrusion into the front setback, as provided in LUC 20.20.025.B, may be required. On slopes in excess of 25 percent, driveways shall be designed to minimize disturbance and should provide the most direct connection between the building and the public or private street; and

3. Changes in existing grade outside the building footprint shall be minimized. Excavation shall not exceed 10 feet. Fill shall not exceed five feet subject to the following provisions: all fill in excess of four feet shall be engineered; and engineered fill may be approved in exceptional circumstances to exceed five feet to a maximum of eight feet. Exceptional circumstances are: 1) instances where driveway access would exceed 15 percent slope if additional fill retained by the building foundation is not permitted; or 2) where the five-foot fill maximum generally is observed but limited additional fill is necessary to accommodate localized variations in topography.

F. Innovative Techniques.

Surfaces paved with pervious pavement or other innovative techniques designed to mimic the function of a pervious surface shall not be included in the calculation of impervious surface areas, so long as the technique is designed by a professional engineer licensed by the State of Washington and the plans are approved by the Director. The Director may require a maintenance plan and long term performance assurance device to ensure the continued function of the pervious pavement or other technique.

Section 10. Section 20.20.520.B of the Bellevue Land Use Code is hereby amended as follows:

B. Applicability.

The requirements of this section shall be imposed any time a permit, approval, or review including land alteration or land development including subdivisions, short subdivisions or planned unit developments, a change in lot coverage or impervious surface, or a change in the area devoted to parking and circulation is required by this Code, or by the International Building Code, as adopted and amended by the City of Bellevue. However, this section does not apply to a permit for a single-family dwelling, unless restrictions on the removal of significant trees on individual single-family lots have been imposed through prior City approval.

Section 11. Section 20.20.520.F of the Bellevue Land Use Code is hereby amended as follows:

F. Site Landscaping.

1. Perimeter Landscaping Requirements for Use Districts. The applicant shall provide site perimeter landscaping either according to the following chart and subject to paragraphs F.2 and F.6 of this section; or in conformance with subsection J of this section.

Perimeter Landscaping Requirements for Use Districts

Land Use District in Which the Subject Property is Located[3]	Street Frontage (Type and Minimum Depth)	Interior Property Lines (Type and Minimum Depth)[1]
R-10, 15, 20, 30	Type III, 10′ but if located in a Transition Area, and directly abutting S/F[2], see Part 20.25B LUC for requirements.	Type III, 8′ but if located in a Transition Area, and directly abutting S/F[2], see Part 20.25B LUC for requirements.
NB, PO, O, OLB, OLB-OS	Type III, 10′ but if located in a Transition Area, and directly abutting S/F[2], R-10, 15, 20 or 30, see Part 20.25B LUC for requirements.[4]	Type III, 10′ but if located in a Transition Area, and directly abutting S/F[2], R-10, 15, 20 or 30, see Part 20.25B LUC for requirements.[4]
LI, GC, CB	Type III, 10′ but if located in a Transition Area, and directly abutting S/F[2], R-10, 15, 20 or 30, see Part 20.25B LUC for requirements.	Type III, 8′ but if located in a Transition Area, and directly abutting S/F[2], R-10, 15, 20 or 30, see Part 20.25B LUC for requirements.

(1) If approved by the Directors of the Planning and Community Development and Utilities Departments, such landscape area may be used for biofiltration swales. If used for biofiltration swales, this area shall be landscaped with quantities and

species of plant materials that are compatible with the functional intent of the biofiltration swale. If the property which abuts the subject property is in the same or a more intensive land use district than the subject property, the landscaping required along that common interior property line may be relocated.

(2) S/F includes the R-1, R-1.8, R-2.5, R-3.5, R-4, R-5, and R-7.5 Land Use Districts.

(3) Notwithstanding the provisions of this paragraph, landscape development requirements for specific uses are listed in paragraph F.2 of this section.

(4) Landscape development requirements for the OLB-OS District may be modified pursuant to Part 20.25L LUC.

2. Planting Requirements for Specific Uses. Notwithstanding the provisions of paragraph F.1 of this section, the uses listed in this paragraph require specific landscaping as follows:

   a. Subject to paragraph F.6 of this section, the following uses require 15 feet of Type I landscaping on all sides when located above ground and not housed within a building or accessory to another use; and if located outside of a public right-of-way:

      i. Utility sub-station;

      ii. Sewage pumping station;

      iii. Water distribution facility.

      Alternative landscaping may be approved by the Director of Planning and Community Development if the requirements of subsection J of this section are met, and if visibility is essential to safety, security, or maintenance access.

   b. Subject to paragraph F.6 of this section, the following uses require 10 feet of Type II landscaping along the street frontage, and 10 feet of Type III landscaping along interior property lines unless a more stringent requirement is specified in paragraph F.1 of this section:

      i. Church;
      ii. Commercial or public parking lot not serving a primary use;
      iii. Mobile home park;
      iv. Government service building;
      v. Community club;
      vi. Charitable or fraternal organization;
      vii. Hospital not located in the Medical Institution District;
      viii. Solid waste disposal facility.

      Alternative landscaping may be approved by the Director of Planning and Community Development if the requirements of subsection J of this section are met.

c. Subject to paragraph F.6 of this section, equipment and vehicle storage yards require 15 feet of Type I landscaping on all sides if in a Transition Area, or visible from a public right-of-way. Alternative landscaping may be approved by the Director of Planning and Community Development if the requirements of subsection J of this section are met.

d. Subject to paragraph F.6 of this section, the perimeter landscaping requirements for schools are set forth in LUC 20.20.740. Alternative landscaping may be approved by the Director of Planning and Community Development if the requirements of subsection J of this section are met.

3. Parking Area Landscaping. Parking areas require landscaping as follows in addition to any site perimeter landscaping required by paragraph F.1 or F.2 of this section:

a. Type V landscaping is required within a parking area.

b. A curb or other physical separation is required around each landscape area to separate that area from the parking and circulation area.

4. Except for site perimeter landscaping areas required under paragraph F.6 of this section, landscape features such as decorative paving, sculptures, rock features or fountains are permitted in the required site perimeter landscaping area so long as such features are made of pervious materials, or are specifically exempt from impervious surface limits under LUC 20.20.460.D. The area devoted to such a feature may not exceed 50 percent of the required area. Rockeries over 30 inches in height are not rock features for the purpose of this section, and may not be counted toward the required area for landscaping.

5. All plantings and fences required by this section are subject to the street intersection sight obstruction requirements, BCC 14.60.240. All plant materials must be pruned as necessary to comply with BCC 14.60.240.

6. Existing Vegetation in Lieu of Landscape Development. If the proposal is located within the Critical Areas Overlay District, the Director shall waive the planting requirements of paragraphs F.1 and F.2 of this section and shall require the use of native vegetation that exists within a critical area or within a critical area buffer in lieu of landscape development if the width of that existing vegetated area equals at least twice the dimension required by paragraph F.1 or F.2 of this section. Supplemental landscaping may be added adjacent to a setback to create the necessary width.

7. The Director will allow the planting requirements of paragraphs F.1 and F.2 of this section to be satisfied within a critical area buffer where landscaping is added pursuant to a habitat improvement plan meeting the requirements of 20.25H.070.

8. Site Landscaping Design Standards.

a. Landscaping plans shall show locations of retained trees, initial size, location and name of plant materials to be installed. For landscaping plans submitted

with Building Permits or Clearing and Grading Permits, detailed irrigation plans are required.

b. Landscaping shall not include irrigated turf strips which are less than five feet in width. Soils within any irrigated turf strip used to satisfy the requirements of this Section 20.20.520 shall be amended as required by soil amendment standards established by the Director.

c. Irrigated turf shall not be included on slopes with finished grades in excess of 33 percent.

d. Landscaping areas which are irrigated shall be designed so that plants are grouped according to distinct hydrozones for irrigation of plants with similar water needs at a good efficiency.

e. In all newly landscaped areas, soils shall be amended as required by soil amendment standards established by the Director.

f. Newly landscaped areas, except turf, shall be covered and maintained with at least two inches of organic mulch to minimize evaporation.

Section 12. Section 20.20.520.I of the Bellevue Land Use Code is hereby amended as follows:

I. Species Choice.

The applicant shall utilize plant materials which complement the natural character of the Pacific Northwest, and which are adaptable to the climatic, topographic, and hydrologic characteristics of the site, and shall include at least 50 percent native species in the required plantings. If the subject property is within the critical areas overlay district, the applicant shall utilize plant species as specified by the Director, which enhance that critical area and critical area buffer. In selecting species, the applicant should utilize plant materials which reduce or eliminate the need for fertilizers, herbicides, or other chemical controls, especially for properties within the critical areas overlay district . Plant materials may not include noxious weeds or species, as designated by the Director.

Section 13. Section 20.20.520.J of the Bellevue Land Use Code is hereby amended as follows:

J. Alternative Landscaping Option.

1. The applicant may request a modification of the landscaping requirements set forth in subsections E through I of this section; provided, however, that modification of the provisions of paragraph F.6 of this section may not allow disturbance of a critical area or critical area buffer.

2. The Director may administratively approve a modification of the landscaping requirements of this chapter if:

a. The proposed landscaping represents an equal or better result than that which could be achieved by strictly following the requirements of this section; and

b. The proposed landscaping complies with the stated purpose of this section (subsection A), and with the purpose and intent of paragraphs F.1 and G of this section; and

c. If a modification of any paragraph excluding subsection E of this section is requested, the proposed landscaping either:

i. Incorporates the increased retention of significant trees and naturally occurring undergrowth, or

ii. Better accommodates or improves the existing physical conditions of the subject property, or

iii. Incorporates elements to provide for wind protection or to maintain solar access, or

iv. Incorporates elements to protect or improve water quality; or

v. Incorporates native species in a design that better buffers a critical area and critical area buffer from uses on the site, including parking.

d. If a modification of subsection E of this section is requested, the proposal either:

i. Incorporates the retention of significant trees equal in number to what would otherwise be required, or

ii. Incorporates the retention of other natural vegetation in consolidated locations which promotes the natural vegetated character of the site.

3. Effect of Approval. Following approval of alternative landscaping by the Director, the applicant may meet the landscaping requirements of this Code by complying with the approved landscape development proposal. A copy of the approved landscape development proposal will be placed in the official file.

Section 14. Section 20.20.525.C.1 of the Bellevue Land Use Code is hereby amended as follows:

C. Implementation.

1. Mechanical equipment located at or below grade may be placed within a required rear or side setback area unless that setback directly abuts a residential land use district or unless that setback is within a critical area, critical area buffer, or critical area structure setback required by Part 20.25H.

Section 15. Section 20.20.540.C of the Bellevue Land Use Code is hereby amended as follows:

C. The children's play area shall not be located in a critical area, critical area buffer, or critical area structure setback required by Part 20.25H, or in required street frontage landscaping.

Section 16. Section 20.20.560.A of the Bellevue Land Use Code is hereby amended as follows:

A. Nonconforming Structures.

1. Repair of an existing nonconforming structure is permitted.

2. Remodeling of a nonconforming structure is permitted provided the fair market value of the remodel does not exceed 100 percent of replacement value of the structure over any three-year period. If remodeling exceeds 100 percent of replacement value over any three-year period, the structure shall be brought into compliance with existing Land Use Code requirements.

3. A nonconforming structure may not be expanded unless the expansion conforms to the regulations of this Code. However, in single-family districts, an expansion may extend along existing building setbacks, provided the area affected by the expansion is not a critical area or critical area buffer .

4. If a nonconforming structure is destroyed by fire, explosion, or other unforeseen circumstances to the extent of 75 percent or less of its replacement value as determined by the Director for the year of its destruction, it may be reconstructed consistent with its previous nonconformity. If such a structure is destroyed to the extent of greater than 75 percent of its replacement value, then any structure erected and any related site development shall conform to the regulations of this Code.

Section 17. Section 20.20.560.E of the Bellevue Land Use Code is hereby amended as follows:

E. Exceptions.

1. Downtown. The provisions of this section shall not apply in the Downtown Special Overlay District, Part 20.25A LUC. Refer to LUC 20.25A.025 for the requirements for nonconforming uses, structures, and sites located within the Downtown Special Overlay District.

2. Critical Areas Overlay District. The provisions of this section do not apply to structures or sites nonconforming to the requirements of Part 20.25H. Refer to LUC 20.25H.065 for the requirements for such nonconforming structures and sites.

3. Shoreline Overlay District. The provisions of this section do not apply to uses, structures or sites nonconforming to the requirements of Part 20.25E. Refer to LUC 20.25E.055 for the requirements for such nonconforming uses, structures and sites.

Section 18. Section 20.20.590.K.1 of the Bellevue Land Use Code is hereby amended as follows:

K. Parking Area and Circulation Improvements and Design.

Parking of vehicles for all uses is only permitted in parking areas that meet the requirements of this section; except that, vehicles on residential lots may also be parked in areas that meet the requirements of LUC 20.20.720 and 20.20.890 relating to the storage of recreational vehicles and trailers.

1. Materials. A parking and circulation area must be hard-surfaced and conform to any applicable City of Bellevue Development Standards as now or hereafter amended. For purposes of this section, hard-surfaced includes pavers, stones, bricks or other similar materials placed to suport vehicle circulation, but also allow rain and other water to penetrate the surface (i.e. “grasscrete”). Hard surfaced also includes innovative pavement techniques approved pursuant to LUC 20.20.460.F. Existing legally established parking areas within critical areas and critical area buffers are exempt from the requirement to use hard surfaced materials. The Director of Planning and Community Development may approve a gravel surface for parking and circulation areas used on a temporary basis during construction pursuant to paragraph K.11 of this section.

Section 19. Section 20.20.730.C of the Bellevue Land Use Code is hereby amended as follows:

C. Large satellite dish antennas in any residential development consisting of detached or single-family attached housing as specified in paragraph B.2 of this section are permitted subject to the following criteria, provided the Director of Planning and Community Development may modify setback and screening requirements upon proof that strict application of the requirements is infeasible or renders use of an antenna impossible:

1. The antenna shall meet front and side setback requirements for the main building and shall be a minimum of five feet from any rear property line;

2. The antenna shall be a minimum of 10 feet distant from any street right-of-way, vehicular access easement, or private road;

3. No antenna shall be located in a setback required by the City’s critical areas regulations (see Part 20.25H LUC), unless affixed to a structure allowed pursuant to LUC 20.20.025.B; and

4. The antenna shall be substantially screened from view from adjacent property and the adjacent public rights-of-way by sight-obstructing landscaping, fencing, on-site structures, or natural topography.

Section 20. Section 20.25B.040.B of the Bellevue Land Use Code is hereby amended as follows:

B. Setbacks.

1. Setback for Primary Structures. Primary structures must be located a minimum of 30 feet from the property line of the district receiving transition.

2. Distance Between Primary Structures. Primary structures must be located a minimum of 20 feet from other primary structures, provided that this separation requirement may be modified pursuant to LUC 20.25H.080.C.

Section 20. Section 20.25B.040.C of the Bellevue Land Use Code is hereby amended as follows:

C. Landscaping, Open Space and Buffers.

1. Landscaping. All landscaping shall comply with standards set forth in LUC 20.20.520. The provisions of LUC 20.20.520.J (Alternative Landscaping Option) are applicable and, in addition, may be used to modify up to 10 feet of required street frontage landscaping.

2. Buffer.

   a. A landscaped buffer, at least 20 feet in width, shall be provided along the entire street frontage where any portion of the street frontage is abutting a district receiving transition and along the interior property line abutting the district receiving transition.

   b. All significant trees within 15 feet of the property line shall be retained as required by LUC 20.20.520.E.

   c. The buffer shall be planted with the following, and shall include at least 50 percent native species in the required plantings:

      i. Evergreen and deciduous trees, of which no more than 40 percent can be deciduous. There shall be a minimum of five trees per 1,000 square feet of buffer area, which shall be a minimum of 10 feet high at planting, along with the evergreen shrubs and living groundcover as described in paragraphs C.2.c(ii) and (iii) of this section to effectively buffer development from adjacent residential properties; and

      ii. Evergreen shrubs, a minimum 42 inches in height at planting, at a spacing no greater than three feet on center; and

      iii. Living groundcover planted to cover the ground within three years; and

      iv. Alternatively, where the street frontage landscaping will be planted to buffer a building elevation and not a parking area, driveway or site development other than a building, lawn no less than five feet in width may be substituted for the shrubs and groundcover required in paragraphs C.2.c.(ii) and (iii) of this section, provided that the soil in the entire area of lawn is amended in accordance with LUC 20.20.520.X. This paragraph does not apply in LI and GC Districts.

d. Where an LI, GC or CB zoned property abuts a residential district on an interior property line, an evergreen hedge a minimum of four feet in height at planting and capable of achieving a continued visual screen with a height of five feet within a three-year period or a combination of shrubs and fence shall be added within the required planting area to achieve the effect of a hedge.

e. Patios and other similar ground level features and trails may be incorporated into the buffer area, except that no more than 20 percent of the area may be used for such features. Patios shall not be located within 10 feet of the property line.

Section 21. Section 20.25C.040.B of the Bellevue Land Use Code is hereby amended as follows:

B. Landscaping Design Standards.

1. The provisions of LUC 20.20.520, Tree Preservation and Landscape Development, except as they conflict with this section shall apply to development in the OLB District.

2. Except for retail auto sales uses, a minimum of 15 percent of the property area of each site shall be in landscaped open space. For each percent that a structure's ground floor area exceeds 15 percent, the landscaping requirements for that site shall be increased by 0.5 percent to a maximum of 20 percent of the property area of the site.

3. Service yards and at-grade mechanical equipment shall be sight-screened from adjoining property or streets or highway by a solid planting of evergreen trees and shrubs at least as high as the equipment or use being screened within two years from the time of planting.

4. Except for retail auto sales uses, parking areas shall include plantings using trees of three inches caliper or 14 to 16 feet high and 42-inch high shrubs at approximately 35 feet on-center parallel to the aisle, or shall be screened as a service yard using similar materials. Other parking lot landscaping shall meet LUC 20.20.590 requirements for Type V landscaping. Plantings shall include a minimum of 50 percent native species. Noxious species, as designated by the Director in submittal requirements are prohibited.

5. When property abuts the right-of-way for I-90, I-405, or SR 520 highways, or abuts parallel frontage roads of said highways, plant material shall be planted and spaced in a planting area a minimum of 10 feet wide. Deciduous trees shall have a minimum caliper of three inches, evergreen trees shall have a minimum height of 14 to 16 feet tall and shall be at intervals of no greater than 35 feet on center along the right-of-way. No more than 30 percent of the trees shall be deciduous. Trees shall have a minimum mature height of 45 feet. Shrubs shall be a minimum of 42 inches high.

6. Trees installed as part of general site landscaping shall be a minimum of one and one-half inches in caliper or eight to 12 feet high.

7. Accessible outdoor gathering areas should be provided for the employees, general public and visitors to the site.

8. Outdoor display of vehicles for retail auto sales uses shall meet the requirements of LUC 20.20.520 for Type V landscaping for auto display areas and LUC 20.20.520.F.2.c for vehicle storage yards.

Section 22. Section 20.25K.040.A of the Bellevue Land Use Code is hereby amended as follows:

20.25K.050 F3 Land Use District.

A. Critical Areas.

Steep Slopes and Landslide Hazard Areas, as designated in LUC 20.25H.025, located within the F3 Land Use District shall not be considered a critical areas for purposes of the Land Use Code.

B. Application Review Criteria.

The provisions of Chapter 20.25B LUC, Transition Area Design District; the provisions of Chapter 20.25C LUC, Office and Limited Business (OLB) District; and the provisions of this Part 20.25K LUC shall apply to applications for development in the F3 Land Use District.

Section 23. Section 20.25L.010.A.2 of the Bellevue Land Use Code is hereby amended as follows:

2. Forty percent of the gross land area, including any critical area, of the subject property must be retained or developed as open space as defined by LUC 20.50.038 for public use and public access. The area reserved as open space shall consist of contiguous acres.

Section 24. Section 20.25L.030 of the Bellevue Land Use Code is hereby amended as follows:

20.25L.030 Dimensional requirements.

Except for the dimensional requirements chart at LUC 20.20.010, the provisions of Chapter 20.20 LUC apply to development within the OLB-OS Land Use District. The following chart establishes the dimensional requirements for the OLB-OS Land Use District.

Dimensions (1)	OLB-OS Land Use District
Minimum Setbacks of Structures (feet) (2) (3) (13)	50
Rear Yard (2) (3) (4) (10) (13)	50
Side Yard (2) (3) (4) (10) (13)	30
2 Side Yards (2) (3) (4) (10) (13)	60
Minimum Lot Area (5) (12)	2 acres

Minimum Dimensions (feet) Width of Street Frontage	200
Width Required in Lot (6)	200
Maximum in Building Height (feet) (7)	70
Maximum Lot Coverage by Structures (8) (9) (10)	35
Floor Area Ratio (11)	0.5

(1) See LUC 20.25H.045 for density/intensity limitations in the critical areas overlay district.

(2) See LUC 20.20.030 for designation and measurement of setbacks.

(3) See LUC Part 20.25H for critical area buffers and critical area structure setbacks.

(4) Except as provided in Note (13) of this section, if the setback abuts a street right-of-way, access easement or private road, the minimum dimension is 10 feet unless a greater dimension is specified.

(5) See LUC 20.20.012.

(6) See LUC 20.20.015.

(7) Except where the provisions of Part 20.25B LUC apply, the allowable building height of any building located in OLB-OS may be increased by one story, but not to exceed 15 feet, if basement parking for that building occupies a minimum of 75 percent of the building footprint.

(8) Maximum lot coverage by structures is calculated based on the total area of the entire parcel designated OLB-OS, including both the Development Area and the Reserved Area.

(9) Lot coverage is calculated after subtracting all critical areas, and stream critical area buffers, as designated by LUC 20.25H.035.

(10) Any portion of a parking structure that is entirely below the average finished grade shall not be included in calculation of maximum lot coverage by structures, and such portion may intrude into required setbacks.

(11) Any office building or any office portion of a building shall not exceed a floor area ratio of 0.5, calculated by dividing the total amount of gross square footage of buildings or structures to be constructed in the Development Area by the net on-site land area (as described in the definition of “Floor Area Ratio” in LUC 20.50.020) of the entire parcel designated OLB-OS, including both the Development Area and the Reserved Area. Refer to LUC 20.25H.045 for limitations on development intensity applicable to sites in the critical areas overlay district.

(12) Only one structure may occupy a site of not less than the minimum lot size (two acres). Two structures may occupy a site of four acres and for each increment of minimum lot size (two acres), an additional structure may be added. Structures on

four acres or more may be clustered. All structures shall conform to these requirements.

(13) The required setbacks on the interior of an OLB-OS parcel, or on the interior of a larger development of which the OLB-OS parcel is a part, may be reduced down to zero feet in order to increase required external setbacks or to preserve significant topographic or vegetative features of the Development Area. Modifications to required setbacks pursuant to this section may be included in the concomitant agreement authorized by LUC 20.25L.010, or may be imposed as conditions to a permit for development in the Development Area.

Section 25. Section 20.30G.140 of the Bellevue Land Use Code is hereby amended as follows:

20.30G.140 Decision criteria.

The Director may approve or approve with modifications an application for a variance from the provisions of the Land Use Code if:

A. General.

1. The variance will not constitute a grant of special privilege inconsistent with the limitation upon uses of other properties in the vicinity and land use district of the subject property; and

2. The variance is necessary because of special circumstances relating to the size, shape, topography, location or surroundings of the subject property to provide it with use rights and privileges permitted to other properties in the vicinity and in the land use district of the subject property; and

3. The granting of the variance will not be materially detrimental to property or improvements in the immediate vicinity of the subject property; and

4. The variance is not inconsistent with the Comprehensive Plan; and

B. Additional Decision Criteria – Variances from Provisions of Part 20.25H.

1. A variance to the requirements of Part 20.25H may be granted only if the applicant demonstrates that a variance from other provisions of the LUC, where allowed under Part 20.30G or 20.30H, are not feasible. For purposes of this section, variances from the other provisions of the LUC shall be considered not feasible only when, considering the function to be served by the proposal a variance to other provisions of the LUC, including non-critical area setbacks, will not realize the intended function of the proposal; and

2. Where the variance involves disturbance of a critical area or critical area buffer, the variance includes a mitigation plan meeting the requirements of LUC 20.25H.XXX.

C. Additional Decision Criteria -- Variances from Standards Applicable to Areas of Special Flood Hazard. In addition to the decision criteria in paragraphs A and B

above, a proposal to vary the requirements for areas of special flood hazard shall meet the following criteria:

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

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

Section 26. Part 20.30P of the Bellevue Land Use Code is hereby repealed in its entirety and replaced as follows:

Part 20.30P Critical Areas Land Use Permit

20.30P.110 Scope.

This Part 20.30P establishes the procedures and criteria that the City will use in making a decision upon an application to develop, disturb or otherwise modify a critical area or critical area buffer.

20.30P.115 Applicability.

This part applies to each application for a critical areas land use permit.

20.30P.120 Purpose.

A critical areas land use permit is the mechanism by which the City may approve limited use and disturbance of a critical area or critical area buffer. The provisions of Part 20.25H and Part 20.25E establish the uses and activities that may be allowed in a critical area or critical area buffer. The provisions of this part establish the requirements for a critical areas land use permit.

20.30P.125 Who may apply.

The property owner may apply for a critical area land use permit.

20.30P.130 Applicable procedure.

The City will process a critical area land use permit through Process II, LUC 20.35.200 et seq. The critical area land use permit may be merged with other permits required for the proposal, pursuant to LUC 20.35.080.

20.30P.140 Decision criteria.

The Director may approve or approve with modifications an application for a critical area land use permit if:

A. The proposal obtains all other permits required by the Land Use Code;

B. The proposal utilizes to the maximum extent possible the best available construction, design and development techniques which result in the least impact on the critical area and critical area buffer; and

C. The proposal incorporates the performance standards of Part 20.25H to the maximum extent applicable; and

D. The proposal will be served by adequate public facilities including streets, fire protection, and utilities; and

E. The proposal includes a mitigation or restoration plan consistent with the requirements of LUC 20.25H.XXX; and

F. The proposal complies with other applicable requirements of this Code.

20.30P.150 Time limitation.

A Critical Areas Land Use Permit automatically expires and is void if the applicant fails to file for a Building Permit or other necessary development permit within one year of the effective date of the Critical Areas Land Use Permit unless:

A. The applicant has received an extension for the Critical Areas Land Use Permit pursuant to LUC 20.30P.155; or

B. The Critical Areas Land Use Permit approval provides for a greater time period.

The time period established pursuant to this section shall not include the time during which an activity was not actively pursued due to the pendency of litigation which may materially affect rights of the applicant for the permit or approval related to that permit or approval.

20.30P.155 Extension.

A. The Director may extend a Critical Areas Land Use Permit, not to exceed one year, if:

1. Unforeseen circumstances or conditions necessitate the extension of the permit; and

2. Termination of the permit would result in unreasonable hardship to the applicant; and the applicant is not responsible for the delay; and

3. The extension of the permit will not cause substantial detriment to existing uses, critical areas, or critical area buffers in the immediate vicinity of the subject property.

B. The Director may grant no more than one extension.

20.30P.160 Assurance device.

In appropriate circumstances, the City may require a reasonable performance or maintenance assurance device in conformance with LUC 20.40.490 to assure compliance with the provisions of the Land Use Code and the Critical Areas Land Use Permit as approved.

20.30P.170 Hold Harmless

Property owners who request approval of disturbance in a critical area or critical area buffer shall execute a hold harmless agreement in a form approved by the City Attorney which releases the City from liability for any damage arising from the location of improvements within the critical area or critical area buffer.

Section 27. Section 20.35.015 of the Bellevue Land Use Code is hereby amended as follows:

20.35.015 Framework for decisions.

A. Land use decisions are classified into four processes based on who makes the decision, the amount of discretion exercised by the decisionmaker, the level of impact associated with the decision, the amount and type of public input sought, and the type of appeal opportunity.

B. Process I decisions are quasi-judicial decisions made by the Hearing Examiner on project applications. The following types of applications require a Process I decision:

1. Conditional Use Permits (CUPs) and Shoreline Conditional Use Permits;

2. Preliminary Subdivision Approval (Plat); and

3. Planned Unit Development (PUD) Approval

provided, that applications for CUPs, shoreline CUPs, preliminary plats, and PUDs, within the jurisdiction of a Community Council pursuant to RCW 35.14.040 shall require a Process III decision.

C. Process II decisions are administrative land use decisions made by the Director. Threshold determinations under the State Environmental Policy Act (SEPA) made by the Environmental Coordinator and Sign Code variances are also Process II decisions. (See the Environmental Procedures Code, BCC 22.02.034 and Sign Code, BCC 22B.10.180.) The following types of applications require a Process II decision:

1. Administrative Amendments;

2. Administrative Conditional Use;

3. Design Review;

4. Home Occupation Permit;

5. Interpretation of the Land Use Code;

6. Preliminary Short Plat;

7. Shoreline Substantial Development Permit;

8. Variance and Shoreline Variance;

9. Critical Area Land Use Permits; and

10. Review under State Environment Policy Act (SEPA) when not consolidated with another permit.

D. Process III decisions are quasi-judicial decisions made by the City Council. The following types of applications require a Process III decision:

1. Site-specific or project-specific rezone;

2. Conditional Use, Shoreline Conditional Use, Preliminary Plat, and Planned Unit Development projects subject to the jurisdiction of a Community Council pursuant to RCW 35.14.040;

3. Master Development Plans for Institutional Uses; and

4. A rezone of any property to the OLB-OS Land Use District designation.

E. Process IV decisions are legislative nonproject decisions made by the City Council under its authority to establish policies and regulations regarding future private and public development and management of public lands. The following are Process IV decisions:

1. Consideration of suggestions for amendments to the Comprehensive Plan (Annual Docket Adoption);

2. Amendments to the text of the Land Use Code or Comprehensive Plan;

3. Amendments to the Comprehensive Plan Map;

4. Amendments to the Zoning Map (rezones) on a citywide or areawide basis.

F. Other types of land use applications and decisions made by the Director, including those set forth below, are minor or ministerial administrative decisions, exempt from the above land use processes. Notice and an administrative appeal opportunity are not provided. LUC 20.35.020 through 20.35.070, however, apply to all land use applications.

1. Boundary Line Adjustment;

2. Final Plat (also requires Hearing Examiner approval prior to recording);

3. Final Short Plat;

4. Land Use Exemption;

5. Temporary Use Permit;

6. Vendor Cart Permit;

7. Requests for Reasonable Accommodation as defined by Part 20.30T LUC.*

**Not effective within the jurisdiction of the East Bellevue Community Council.*

Section 28. Section 20.35.210 of the Bellevue Land Use Code is hereby amended as follows:

20.35.210 Notice of application.

A. Notice of application for Process II land use decisions shall be provided within 14 days of issuance of a notice of completeness as follows:

Table 20.35.210.A

Application Type	Publish	Mail	Sign
Administrative Amendment	X	X	X
Administrative Conditional Use	X	X	X
Design Review	X	X	X
Home Occupation Permit	X	X	
Interpretation of Land Use Code	X		
Preliminary Short Plat	X	X	X
Shoreline Substantial Development Permit	X	X	
Variance, Shoreline Variance	X	X	
Critical Areas Land Use Permit	X	X	
SEPA Review (when not consolidated with another permit	X		

1. For Process II decisions not included in Table 20.35.210.A, notice of application shall be provided by publication and mailing.

2. When required by Table 20.35.210.A, publishing shall include publication of the project description, location, types of City permits or approvals applied for, date of application and location where the complete application file may be reviewed, in a newspaper of general circulation in the City.

3. Mailing shall include mailed notice to owners of real property within 200 feet of the project site including the following information:

a. The date of application;

b. The project description and location;

c. The types of City permit(s) or approval(s) applied for;

d. The Director may, but need not, include other information to the extent known at the time of notice of application, such as: the identification of other City permits required, related permits from other agencies or jurisdictions not included in the City permit process, the dates for any public meetings or public hearings, identification of any studies requested for application review, any existing environmental documents that apply to the project, and a statement of the preliminary determination, if one has been made, of those development regulations that will be used for project mitigation.

4. If signs are required, two signs or placards shall be posted by the applicant on the site or in a location immediately adjacent to the site that provides visibility to motorists using adjacent streets. The Director shall establish standards for size, color, layout, design, wording, placement, and timing of installation and removal of the signs or placards.

5. Mailings shall also include mailing notice of the application including at least the information required in paragraph A.1 of this section to each person who has requested such notice for the calendar year and paid any fee as established by the Director. This mailing shall also include all members of a Community Council and a representative from each of the neighborhood groups, community clubs, or other citizens' groups who have requested notice of land use activity. As an alternative to mailing notice to each such person, notice may be provided by electronic mail only, when requested by the recipient.

Section 29. Section 20.40.490.D of the Bellevue Land Use Code is hereby amended as follows:

D. Amount of Assurance Device.

1. General. The applicable Department Director shall determine the amount of the assurance device as follows:

a. For a performance device the amount will be 150 percent of the cost of the work or improvements covered by the assurance device based on estimated costs immediately following the expiration of the device.

b. For a maintenance device the amount will not be less than 20 percent of the cost of replacing the materials covered by the assurance device based on estimated costs on the last day covered by the device. The Director may require an amount more than 20 percent where the Director determines such increased amount is necessary to assure that adequate funds will be available to protect health, safety and welfare, or to protect critical area functions and values in the event of total or partial failure or underperformance of the work requiring the maintenance device..

2. Assistance in Determining Estimated Costs. The applicable Department Director may consult with one or more persons with applicable special knowledge or expertise in determining the cost of work or improvements covered by an assurance device under paragraph D.1 of this section. The applicant shall pay the actual costs of this consultation prior to the Director accepting the device.

Section 30. Section 20.40.490.I of the Bellevue Land Use Code is hereby amended as follows:

I. Use of Proceeds – Emergency Work by City.

If at any time the Director or Director's designee determines that actions or inaction associated with any assurance device have created an emergency situation endangering the public health, safety, or welfare, creating a potential liability for the City, or endangering City streets, utilities, or property, or endangering critical area functions and values; and if the nature or timing of such an emergency precludes the notification of applicants as provided in subsection G of this section while still minimizing or avoiding the effects of the emergency, the City may use the assurance device to correct the emergency situation. The City may either have employees of the City do the work or make the improvements, or may have a contractor do the work or make the improvements. If the City uses the assurance device as provided by this section, the applicant shall be notified in writing within four days of the commencement of emergency work. The notice must state the work that was completed and the nature or timing of the emergency that necessitated the use of the assurance device without prior notification.

Section 31. Section 20.40.500.B of the Bellevue Land Use Code is hereby amended as follows:

B. Expiration of Vested Status of Land Use Permit or Approval.

1. The vested status of a land use permit or approval shall expire as provided in paragraph B.2 of this section; provided, that:

    a. Variances shall run with the land in perpetuity if recorded with King County Department of Records and Elections within 60 days following the City's final action; and

    b. Critical Areas Land Use Permits shall expire as set forth in LUC 20.30P.150; and

    c. The time period established pursuant to paragraph B.2 of this section shall not include the time during which an activity was not actively pursued due to the pendency of litigation which may materially affect rights of the applicant for the permit or approval related to that permit or approval.

2. The vested status of a land use permit or approval shall expire two years from the date of the City's final decision, unless:

    a. A complete Building Permit application is filed before the end of the two-year term. In such cases, the vested status of the land use permit or approval shall be automatically extended for the time period during which the Building

Permit application is pending prior to issuance; provided, that if the Building Permit application expires or is canceled pursuant to BCC 23.05.160, the vested status of a land use permit or approval shall also expire or be canceled. If a Building Permit is issued and subsequently renewed, the vested status of the land use permit or approval shall be automatically extended for the period of the renewal;

b. For projects which do not require a Building Permit, the use allowed by the permit or approval has been established prior to the expiration of the vested status of the land use permit or approval and is not terminated by abandonment or otherwise; or

c. The vested status of a land use permit or approval is extended pursuant to paragraph B.3 of this section.

3. When a Building Permit is issued, the vested status of a land use permit or approval shall be automatically extended for the life of the Building Permit. If the Building Permit expires, or is revoked or canceled pursuant to BCC 23.05.160 or otherwise, then the vested status of a land use permit or approval shall also expire, or be revoked or canceled.

Section 32. Section 20.50.020 of the Bellevue Land Use Code is hereby amended by the addition of the following new definition of “fish habitat”:

Fish habitat. Any habitat which is used by any fish at any life stage at any time of the year, including potential habitat likely to be used by fish which could be recovered by restoration or management. Fish habitat includes off-channel habitat.

Section 33. Section 20.50.026 of the Bellevue Land Use Code is hereby amended by the addition of the following new definition of “impervious surface”:

Impervious surface. Any structure or other hard surface affixed to the ground that prevents or retards the entry of water into the soil layer, or that causes water to run off the surface in greater quantities or at an increased rate of flow from the flow rate prior to addition of such surface. Impervious surfaces include, without limitation: structures, including eaves; vehicular, bicycle, pedestrian or other circulation facilities constructed of solid surfaces, including pavement, concrete, brick or stone; decks, patios, sport courts, swimming pools, hot tubs and similar recreation facilities; and landscape features, including sheds, arbors, and play structures.

Section 34. Section 20.50.040 of the Bellevue Land Use Code is hereby amended by the addition of the following new definition of “primary structure”:

Primary structure. The structure on a site that houses the principal use. For residential uses, the primary structure houses the dwelling unit(s). For non-residential uses, the primary structure houses the use undertaken on the site, as classified by LUC 20.10.440. Primary structures do not include structures that contain only certain functions or equipment that support the principal use, such as sheds, garages, or mechanical equipment structures.

Section 35. A new section 20.50.042 of the Bellevue Land Use Code is hereby added by the addition of the following new definition of "qualified professional":

Qualified professional. A qualified professional is one who, by meeting certain defined educational, licensing or other qualifications established by the Director, has the knowledge to provide expert design, engineering, habitat, or other evaluations necessary to allow the city to make a decision on a specific proposal. Where the applicant for a proposal is a city, county, state or federal agency, a qualified professional may include trained staff whose job functions include providing the expertise required by this code.

Section 36. This ordinance shall take effect on December 1, 2005.

PASSED by the City Council this _____ day of _____, 2005, and signed in authentication of its passage this _____ day of _____, 2005.

(SEAL)

_____
Connie B. Marshall, Mayor

Approved as to form:

Lori M. Riordan, City Attorney

_____

Attest:

_____
Myrna L. Basich, City Clerk

Published _____

Subdivision and PUD Amendments

CITY OF BELLEVUE, WASHINGTON
ORDINANCE NO. _____

AN ORDINANCE amending the Bellevue Land Use Code to adopt amendments to critical area requirements applicable to subdivisions and Planned Unit Developments; amending Sections 20.45A.030, 20.45A.130, 20.45B.020, 20.45B.130, 20.30D.120, 20.30D.150, 20.30D.160, 20.30D.165, 20.30D.170, 20.30D.200, 20.30D.250 of the Bellevue Land Use Code; creating new Sections 20.45A.060, 20.45A.055, and 20.30D.167 in the Bellevue Land Use Code; deleting Section 20.45A.280 and 20.45B.270; and establishing an effective date.

WHEREAS, [insert a number of whereas clauses that describe why the City is processing the amendment based on BAS, public review and Comprehensive Plan]

WHEREAS, the Planning Commission held a public hearing on July 6, 2005 with regard to such proposed Land Use Code amendment; and

WHEREAS, the Planning Commission recommends that the City Council approve such proposed amendment; and

WHEREAS, the City of Bellevue has complied with the State Environmental Policy Act (SEPA), Chapter 43.21C RCW, and the City's Environmental Procedures Code, BCC 22.02; now, therefore,

THE CITY COUNCIL OF THE CITY OF BELLEVUE, WASHINGTON, DOES ORDAIN AS FOLLOWS:

Section 1. Section 20.45A.030 of the Bellevue Land Use Code is hereby amended as follows:

20.45A.030 Purpose.

This chapter is adopted in furtherance of the Comprehensive Plan of the City. It is hereby declared that the regulations contained in this chapter are necessary for the protection and preservation of the public health, safety and general welfare in accordance with the standards established by the State of Washington, Chapter 58.17 RCW, and established by the City of Bellevue to prevent the overcrowding of land; to lessen congestion in the streets and highways; to promote effective use of land; to promote safe and convenient travel by the public on streets and highways; to provide for adequate light and air; to facilitate adequate provision for water, sewerage, storm water drainage, parks and recreation areas, sites for schools and schoolgrounds and other public requirements; to provide for proper ingress and egress; to provide for the expeditious review and approval of proposed subdivisions which conform to zoning standards and local plans and policies; to adequately provide for the housing and commercial needs of the community; to protect critical areas and critical area buffers as

designated in Part 20.25H; and to require uniform monumenting of land subdivisions and conveyance by accurate legal description.

Section 2. A new Section 20.45A.060 of the Bellevue Land Use Code is hereby created as follows:

20.45A.060 Special requirements for Plats with critical areas or critical area buffers.

A. Allowed density. Density shall be calculated pursuant to LUC 20.25H.045.

B. Conservation Subdivision.

1. When Required. Proposals for residential subdivision within the Critical Areas Overlay District shall be processed as a conservation subdivision pursuant to this section 20.45A.060.B in the following cases:

   a. the amount of critical area and critical area buffer on the site totals at least 1 acre; or

   b. the site abuts a known salmon-bearing stream; or

   c. the critical area or critical area buffer on the site abuts a critical area or critical area buffer on another site, or a site owned or managed by the City or other public agency for open space or park uses.

2. Tract required. The property owner receiving approval of a residential subdivision pursuant to this section shall delineate the critical area and critical area buffer and set aside such areas in separate tracts, designated as Native Growth Protection Area(s) (NGPA) on the face of the final plat. The final plat shall contain the following restrictions for use, development and disturbance of such NGPA(s) in a format approved by the City Attorney:

   a. An assurance that: the tract will be kept free from all development and disturbance except where allowed or required for habitat improvement projects, vegetation management, or new or expanded city parks pursuant to LUC 20.25H.070; and that native vegetation, existing topography, and other natural features will be preserved for the purpose of preventing harm to property and the environment, including, but not limited to, controlling surface water runoff and erosion, maintaining slope stability, buffering and protecting plants and animal habitat;

   b. The right of the City of Bellevue to enforce the terms of the restriction; and

   c. A management plan for the NGPA designating future management responsibility.

3. Dimensional standards modification. The dimensional standards set forth in 20.20.010 are modified as follows for sites processed through the conservation subdivision process. All other dimensional standards and requirements of 20.20.010 shall apply, including applicable footnotes:

Land Use District	R-1	R-1.8	R-2.5	R-3.5	R-4	R-5	R-7.5*	R-10 (3)	R-15 (3)	R-20 (3)	R-30 (3)
Minimum Setbacks of structures (feet) Front Yard (1) (2) (7)	25	20	10	10	10	10	10	10	10	10	10
Rear Yard (4) (7)	20	20	20	15	15	15	15	20	20	20	20
Side Yard (4) (7)	5	5	5	5	5	5	5	5	5	5	5
2 Side Yards (4) (7)	15	10	10	10	10	10	10	10	10	10	10
Minimum Lot Area Acres (A) or Sq. Ft.	22,750	13,000	8775	6500	5525	4680	3055	5525	5525	5525	5525
Maximum Lot Coverage by Structures (percent)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Impervious Surface	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)

*Not effective within the jurisdiction of the East Bellevue Community Council.

Notes:

(1) Any garage or other structure shall be set back the minimum necessary to allow on-site parking on any driveway without blocking a sidewalk, for proposals without garages, there shall be sufficient area on the site to allow for required on-site parking without blocking a sidewalk.

(2) Where the front yard setback is reduced below the minimum setback established in 20.20.010, all front yard setbacks along a public right of way shall be the same for each lot in the development, so that the minimum front yard setback is also the maximum front yard setback.

(3) Where there is a conflict between this section B.3 and the requirements of the Transition Area Overlay District, the provisions of the Transition Area Overlay District shall prevail.

(4) The required yard setback may not be reduced below the minimum required for the underlying land use district where the development abuts another subdivision or development with the same land use designation, where the majority of the lots in the abutting development meet or exceed the minimum dimensional requirements for the land use district.

(5) Lot coverage. The maximum lot coverage for each lot is determined by multiplying the maximum lot coverage in the underlying land use district by the lot coverage factor. The lot coverage factor is:

lot coverage factor = 1+((required minimum lot size - actual lot size)/required minimum lot size)

The following example illustrates this calculation:

Underlying land use district, R-3.5
Maximum lot coverage for district is 0.35
Required minimum lot size is 10,000
Actual lot size in conservation subdivision is 6800 square feet

Lot coverage factor = 1 + ((10,000 – 6800)/10,000) = 1.32
Allowed lot coverage = 0.35 x 1.32 = 0.46 (rounded to nearest hundredth)

(6) Impervious surface. Impervious surface for the subdivision considered on the whole shall not exceed 50%, based on the total site size. The final plat shall designate the allowed impervious surface for each separate lot.

(7) A required minimum setback may not be reduced below that required to maintain the minimum separation between structures required by the International Building Code, as adopted and amended by the City of Bellevue, considering the location of existing structures on abutting properties.

4. Site Design.

a. Roads must be designed parallel to contours with consideration to maintaining consolidated areas of natural topography and vegetation. Access must be located in the least sensitive area feasible; and

b. Change in grade, cleared area and volume of cut or fill on the site must be minimized; and

c. Utilities and other facilities should be located to utilize common corridors wherever possible; and

d. Each lot with slopes in excess of 25 percent shall demonstrate provision for feasible driveway access to a future residence not to exceed 15 percent or provide for meeting emergency access and fire protection by other means allowed by applicable codes, and shall demonstrate feasibility of construction of a residence on the lot through a design consistent with the standards of this Code. Shared driveway access and private roads should be utilized where significant reduction of grading can be accomplished compared to separate driveway access for each individual lot.

C. Conventional Subdivision. Proposals for residential subdivision not required to satisfy the provisions of subsection B above shall meet the following requirements.

1. Lot Location.

a. Lots which contain critical area or critical area buffers must be configured in a manner which, to the maximum extent possible, will allow a structure to be built on the least sensitive portion of the site; and

b. Lots which contain critical area or critical area buffers must be configured in a manner which will allow a designated building pad to be located outside of any critical area or critical area buffer.

2. Site Design.

a. Roads must be designed parallel to contours with consideration to maintaining consolidated areas of natural topography and vegetation. Access must be located in the least sensitive area feasible; and

b. Change in grade, cleared area and volume of cut or fill on the site must be minimized; and

c. Utilities and other facilities should be located to utilize common corridors wherever possible; and

d. Critical areas, critical area buffers, and retained significant trees shall be placed in Native Growth Protection Easements (NGPE) designated on the final plat document. The final plat shall contain the following restrictions for use, development and disturbance of the NGPE in a format approved by the City Attorney:

   i. An assurance that: the NGPE will be kept free from all development and disturbance except where allowed or required for habitat improvement projects, vegetation management, and new or expanded city parks pursuant to LUC 20.25H.070; and that native vegetation, existing topography, and other natural features will be preserved for the purpose of preventing harm to property and the environment, including, but not limited to, controlling surface water runoff and erosion, maintaining slope stability, buffering and protecting plants and animal habitat;

   ii The right of the City of Bellevue to enforce the terms of the restriction; and

   iii A management plan for the NGPE designating future management responsibility.

e. NGPEs on individual lots within the plat shall be contiguous with NGPEs on other lots to the maximum extent feasible; and

f. Each lot with slopes in excess of 25 percent shall demonstrate provision for feasible driveway access to a future residence not to exceed 15 percent or provide for meeting emergency access and fire protection by other means allowed by applicable codes, and shall demonstrate feasibility of construction of a residence on the lot through a design consistent with the standards of this Code. Shared driveway access and private roads should be utilized where significant reduction of grading can be accomplished compared to separate driveway access for each individual lot.

Section 3. Section 20.45A.130 of the Bellevue Land Use Code is hereby amended as follows:

20.45A.130 Preliminary plat – Decision criteria.

The City may approve or approve with modifications a preliminary plat if:

A. The preliminary plat makes appropriate provisions for, but not limited to, the public health, safety and general welfare; for open spaces, drainage ways, streets, sidewalks, alleys, other public ways, water supplies, sanitary waste, parks, playgrounds, sites for schools and schoolgrounds; and

B. The public use and interest is served by the platting of the subdivision; and

C. The preliminary plat appropriately considers the physical characteristics of the proposed subdivision site; and

D. The proposal complies with all applicable provisions of the Land Use Code, BCC Title 20, the Utility Codes, BCC Title 24, the City of Bellevue Development Standards and Chapter 58.17 RCW; and

E. The proposal is in accord with the Comprehensive Plan, BCC Title 21; and

F. Each lot in the proposal can reasonably be developed in conformance with current Land Use Code requirements without requiring a variance, however, requests for modifications to the requirements of Part 20.25H, where allowed under the provisions of that Part, may be considered together with an application for preliminary plat so long as the resulting lots may each be developed without individually requiring a variance; and

G. All necessary utilities, streets or access, drainage and improvements are planned to accommodate the potential use of the entire property.

Section 4. Section 20.45A.280 of the Bellevue Land Use Code is hereby deleted in its entirety as follows:

Section 5. Section 20.45B.020 of the Bellevue Land Use Code is hereby amended as follows:

20.45B.020 Purpose.

Pursuant to RCW 58.17.060 it is the intent of this chapter to permit administrative processing and approval of a division of land into nine or fewer lots, tracts, parcels, or sites; to promote the public health, safety, and general welfare; to further the goals and objectives of the Comprehensive Plan; to facilitate adequate provisions for water, sewer, storm water drainage, ingress and egress, and public uses; to promote the coordinated development of vacant lands; to protect critical areas and critical area buffers as designated in Part 20.25H; and to require conveyance by accurate legal description.

Section 6. A new Section 20.45B.055 of the Bellevue Land Use Code is hereby created as follows:

20.45B.055 Special requirements for Short Plats with critical areas or critical area buffers.

A. Allowed density. Density shall be calculated pursuant to LUC 20.25H.045.

B. Conservation Short Subdivision.

1. When Required. Proposals for residential short subdivision within the Critical Areas Overlay District shall be processed as a conservation short subdivision pursuant to this section 20.45B.055.B in the following cases:

a. the amount of critical area and critical area buffer on the site totals at least 1 acre; or

b. the site abuts a known salmon-bearing stream; or

c. the critical area or critical area buffer on the site abuts a critical area or critical area buffer on another site, or a site owned or managed by the City or other public agency for open space or park uses.

2. Tract required. The property owner receiving approval of a residential short subdivision pursuant to this section shall delineate the critical area and critical area buffer and set aside such areas in separate tracts, designated as Native Growth Protection Area(s) (NGPA) on the face of the final short plat. The final short plat shall contain the following restrictions for use, development and disturbance of such NGPA(s) in a format approved by the City Attorney:

a. An assurance that: the tract will be kept free from all development and disturbance except where allowed or required for habitat improvement projects, vegetation management, or new or expanded city parks pursuant to LUC 20.25H.070; and that native vegetation, existing topography, and other natural features will be preserved for the purpose of preventing harm to property and the environment, including, but not limited to, controlling surface water runoff and erosion, maintaining slope stability, buffering and protecting plants and animal habitat;

b. The right of the City of Bellevue to enforce the terms of the restriction; and

c. A management plan for the NGPA designating future management responsibility.

3. Dimensional standards modification. The dimensional standards set forth in 20.20.010 are modified as follows for sites processed through the conservation short subdivision process. All other dimensional standards and requirements of 20.20.010 shall apply, including applicable footnotes:

Land Use District	**R-1**	**R-1.8**	**R-2.5**	**R-3.5**	**R-4**	**R-5**	**R-7.5***	**R-10** (3)	**R-15** (3)	**R-20** (3)	**R-30** (3)
Minimum Setbacks of structures (feet) Front Yard (1) (2) (7)	25	20	10	10	10	10	10	10	10	10	10
Rear Yard (4) (7)	20	20	20	15	15	15	15	20	20	20	20
Side Yard (4) (7)	5	5	5	5	5	5	5	5	5	5	5
2 Side Yards (4) (7)	15	10	10	10	10	10	10	10	10	10	10
Minimum Lot Area Acres (A) or Sq. Ft.	22,750	13,000	8775	6500	5525	4680	3055	5525	5525	5525	5525

Land Use District	R-1	R-1.8	R-2.5	R-3.5	R-4	R-5	R-7.5*	R-10 (3)	R-15 (3)	R-20 (3)	R-30 (3)
Maximum Lot Coverage by Structures (percent)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)	(5)
Impervious Surface	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)

*Not effective within the jurisdiction of the East Bellevue Community Council.

Notes:

(1) Any garage or other structure shall be set back the minimum necessary to allow on-site parking on any driveway without blocking a sidewalk, for proposals without garages, there shall be sufficient area on the site to allow for required on-site parking without blocking a sidewalk.

(2) Where the front yard setback is reduced below the minimum setback established in 20.20.010, all front yard setbacks along a public right of way shall be the same for each lot in the development, so that the minimum front yard setback is also the maximum front yard setback.

(3) Where there is a conflict between this section B.3 and the requirements of the Transition Area Overlay District, the provisions of the Transition Area Overlay District shall prevail.

(4) The required yard setback may not be reduced below the minimum required for the underlying land use district where the development abuts another subdivision or development with the same land use designation, where the majority of the lots in the abutting development meet or exceed the minimum dimensional requirements for the land use district.

(5) Lot coverage. The maximum lot coverage for each lot is determined by multiplying the maximum lot coverage in the underlying land use district by the lot coverage factor. The lot coverage factor is:

lot coverage factor = 1+((required minimum lot size - actual lot size)/required minimum lot size)

The following example illustrates this calculation:

Underlying land use district, R-3.5
Maximum lot coverage for district is 0.35
Required minimum lot size is 10,000
Actual lot size in conservation short subdivision is 6800 square feet

Lot coverage factor = 1 + ((10,000 – 6800)/10,000) = 1.32
Allowed lot coverage = 0.35 x 1.32 = 0.46 (rounded to nearest hundredth)

(6) Impervious surface. Impervious surface for the subdivision considered on the whole shall not exceed 50%, based on the total site size. The final short plat shall designate the allowed impervious surface for each separate lot.

(7) A required minimum setback may not be reduced below that required to maintain the minimum separation between structures required by the International Building Code, as adopted and amended by the City of Bellevue, considering the location of existing structures on abutting properties.

4. Site Design.

   a. Roads must be designed parallel to contours with consideration to maintaining consolidated areas of natural topography and vegetation. Access must be located in the least sensitive area feasible; and

   b. Change in grade, cleared area and volume of cut or fill on the site must be minimized; and

   c. Utilities and other facilities should be located to utilize common corridors wherever possible; and

   d. Each lot with slopes in excess of 25 percent shall demonstrate provision for feasible driveway access to a future residence not to exceed 15 percent or provide for meeting emergency access and fire protection by other means allowed by applicable codes, and shall demonstrate feasibility of construction of a residence on the lot through a design consistent with the standards of this Code. Shared driveway access and private roads should be utilized where significant reduction of grading can be accomplished compared to separate driveway access for each individual lot.

C. Conventional Short Subdivision. Proposals for residential short subdivision not required to satisfy the provisions of subsection B above shall meet the following requirements.

1. Lot Location.

   a. Lots which contain critical area or critical area buffers must be configured in a manner which, to the maximum extent possible, will allow a structure to be built on the least sensitive portion of the site; and

   b. Lots which contain critical area or critical area buffers must be configured in a manner which will allow a designated building pad to be located outside of any critical area or critical area buffer.

2. Site Design.

   a. Roads must be designed parallel to contours with consideration to maintaining consolidated areas of natural topography and vegetation. Access must be located in the least sensitive area feasible; and

   b. Change in grade, cleared area and volume of cut or fill on the site must be minimized; and

   c. Utilities and other facilities should be located to utilize common corridors wherever possible; and

   d. Critical areas, critical area buffers, and retained significant trees shall be placed in Native Growth Protection Easements (NGPE) designated on the final short plat document. The final short plat shall contain the following

restrictions for use, development and disturbance of the NGPE in a format approved by the City Attorney:

i. An assurance that: the NGPE will be kept free from all development and disturbance except where allowed or required for habitat improvement projects, vegetation management, and new or expanded city parks pursuant to LUC 20.25H.070; and that native vegetation, existing topography, and other natural features will be preserved for the purpose of preventing harm to property and the environment, including, but not limited to, controlling surface water runoff and erosion, maintaining slope stability, buffering and protecting plants and animal habitat;

ii The right of the City of Bellevue to enforce the terms of the restriction; and

iii A management plans for the NGPE designating future management responsibility.

e. NGPEs on individual lots within the short plat shall be contiguous with NGPEs on other lots to the maximum extent feasible; and

f. Each lot with slopes in excess of 25 percent shall demonstrate provision for feasible driveway access to a future residence not to exceed 15 percent or provide for meeting emergency access and fire protection by other means allowed by applicable codes, and shall demonstrate feasibility of construction of a residence on the lot through a design consistent with the standards of this Code. Shared driveway access and private roads should be utilized where significant reduction of grading can be accomplished compared to separate driveway access for each individual lot.

Section 7. Section 20.45B.130 of the Bellevue Land Use Code is hereby amended as follows:

20.45B.130 Preliminary short plat – Department Director's decision.

A. Decision Criteria.

The Department Director may approve or approve with modifications if:

1. The preliminary short plat makes appropriate provisions for, but not limited to, the public health, safety and general welfare, for open spaces, drainage ways, streets, sidewalks, alleys, other public ways, water supplies, sanitary waste; and

2. The public interest is served by the short subdivision; and

3. The preliminary short plat appropriately considers the physical characteristics of the proposed short subdivision site; and

4. The proposal complies with all applicable provisions of the Land Use Code, BCC Title 20, the Utility Codes, BCC Title 24, and the City of Bellevue Development Standards; and

5. The proposal is in accord with the Comprehensive Plan, BCC Title 21; and

6. Each lot in the proposal can reasonably be developed in conformance with current Land Use Code requirements without requiring a variance, however, requests for modifications to the requirements of Part 20.25H, where allowed under the provisions of that Part, may be considered together with an application for preliminary short plat so long as the resulting lots may each be developed without individually requiring a variance; and

7. All necessary utilities, streets or access, drainage and improvements are planned to accommodate the potential use of the entire property.

Section 8. Section 20.45B.270 of the Bellevue Land Use Code is hereby deleted in its entirety as follows:

Section 9. Section 20.30D.120 of the Bellevue Land Use Code is hereby amended as follows:

20.30D.120 Purpose.

A Planned Unit Development is a mechanism by which the City may permit a variety in type, design, and arrangement of structures; and enable the coordination of project characteristics with features of a particular site in a manner consistent with the public health, safety and welfare. A Planned Unit Development allows for innovations and special features in site development, including the location of structures, conservation of natural land features, protection of critical areas and critical area buffers, the use of low impact development techniques, conservation of energy, and efficient utilization of open space.

Section 10. Section 20.30D.150 of the Bellevue Land Use Code is hereby amended as follows:

20.30D.150 Planned Unit Development plan – Decision criteria.

The City may approve or approve with modifications a Planned Unit Development plan if:

A. The Planned Unit Development is consistent with the Comprehensive Plan; and

B. The Planned Unit Development accomplishes, by the use of permitted flexibility and variation in design, a development that is better than that resulting from traditional development. Net benefit to the City may be demonstrated by one or more of the following:

   1. Placement, type or reduced bulk of structures, or

   2. Interconnected usable open space, or

3. Recreation facilities, or

4. Other public facilities, or

5. Conservation of natural features, or

6. Conservation of critical areas and critical area buffers beyond that required under Part 20.25H; or

6. Aesthetic features and harmonious design, or

7. Energy efficient site design or building features, or

8. Use of low impact development techniques; and

C. The Planned Unit Development results in no greater burden on present and projected public utilities and services than would result from traditional development and the Planned Unit Development will be served by adequate public or private facilities including streets, fire protection, and utilities; and

D. The perimeter of the Planned Unit Development is compatible with the existing land use or property that abuts or is directly across the street from the subject property. Compatibility includes but is not limited to size, scale, mass and architectural design of proposed structures; and

E. Landscaping within and along the perimeter of the Planned Unit Development is superior to that required by this Code, LUC 20.20.520, and enhances the visual compatibility of the development with the surrounding neighborhood; and

F. At least one major circulation point is functionally connected to a public right-of-way; and

G. Open space within the Planned Unit Development is an integrated part of the project rather than an isolated element of the project; and

H. The design is compatible with and responds to the existing or intended character, appearance, quality of development and physical characteristics of the subject property and immediate vicinity; and

I. That part of a Planned Unit Development in a Transition Area meets the intent of the Transition Area requirements, Part 20.25B LUC, although the specific dimensional requirements of Part 20.25B may be modified through the Planned Unit Development process; and

J. Roads and streets, whether public or private, within and contiguous to the site comply with Transportation Department guidelines for construction of streets; and

K. Streets and sidewalks, existing and proposed, are suitable and adequate to carry anticipated traffic within the proposed project and in the vicinity of the proposed project; and

L. Each phase of the proposed development, as it is planned to be completed, contains the required parking spaces, open space, recreation space, landscaping and utility area necessary for creating and sustaining a desirable and stable environment.

Section 11. Section 20.30D.160 of the Bellevue Land Use Code is hereby amended as follows:

20.30D.160 Planned Unit Development plan – Conservation feature and recreation space requirement.

A. General.

Within a Planned Unit Development including residential uses:

1. Through the Conservation Design Features included in subsection B below, the proposal must earn square footage credit totaling at least 40 percent of the gross land area, which includes any critical area or critical area buffer; and

2. At least 10 percent of the gross land area, which includes any critical area or critical area buffer, of the subject property must be retained or developed as common recreation space as defined by LUC 20.50.044; provided, however, that the requirement for recreation space may be waived if the total of critical area and critical area buffer equals at least 40 percent of the gross land area; and

3. Recreation space as required by paragraph A.2 of this section may be included within non-critical area Conservation Design Features required by paragraph A.1 of this section if:

   a. The common recreation space does not interfere with the purposes and functions of the Conservation Design Feature; and

   b. At least 20 percent of the gross land area is nonrecreation open space.

   Provided, however, that recreation space may not occur in a critical area or a critical area setback;

4. The area of the site devoted to pedestrian trails shall not be included in the required common recreation space unless public trails are specifically required by the City;

5. An outdoor children's play area meeting the requirements of LUC 20.20.540 may be included in the above described common recreation space requirement;

6. For mixed use projects, the required open and recreation space shall be designed to meet the needs of both the residential and commercial uses.

B. Conservation Design Features. To satisfy the requirements of Subsection A above, a proposal shall include any combination of the following factors. The total square footage credit required in Subsection A is calculated by multiplying the square footage actually dedicated to the conservation design feature by the conservation factor set forth below. Where noted, certain Conservation Design

Features are not eligible to earn square footage credit unless the minimum size requirements are met. After the minimum size requirement is met, each square foot provided may be used to calculate the square footage credit earned by the feature.

Conservation Design Feature	Conservation Factor	Minimum Size of Retained Area before credit earned
Critical area or areas placed in a tract (connection between isolated critical areas credited as corridor below.)	1.0	
Preservation of Westside lowland conifer hardwood forest not already in critical area and/or preservation of recommended forest habitat to protect species of local importance	1.2	20,000 sq. ft.
Designated wildlife corridor, trail or other essential connection set aside in a tract	1.2	
Critical area buffer increased by 15 % or more and placed in tract	1.2	
Preservation of native soils and mature trees on required open space or combination of preservation with hydrologic enhancement (soil amendment and tree such that vegetative areas are connected to soil below)	1.1	10,000 sq. ft. canopy cover or amended and planted area
Site area set aside in separate tract to achieve bio-retention and runoff dispersion to natural areas or to soil layer below; e.g. community rain garden, downspout dispersion or similar LID techniques. Must serve more than one residence.	1.1	5,000 sq. ft. reserved for rain garden or dispersion
Landscaped or grass open space in separate tract for active or passive recreation but only partially connected to soil below	0.9	2,500 sq. ft. contiguous area
Paved but pervious open space; e.g. court yards, sports courts and similar facilities	0.7	1500 sq. ft.
Impervious paved court yard, recreation or other design feature that meets minimum definition of open space	0.5	2500 sq. ft.

C. Maintenance.

In appropriate circumstances the City may require a reasonable performance or maintenance assurance device in conformance with LUC 20.40.490 to assure the retention and continued maintenance of all open and recreation space in conformance with the Land Use Code and the Planned Unit Development plan approval.

Section 12. Section 20.30D.165 of the Bellevue Land Use Code is hereby amended as follows:

20.30D.165 Planned Unit Development plan – Request for modification of zoning requirements.

The applicant may request a modification of the requirements and standards of the Land Use Code as follows:

A. Density.

1. General. The applicant may request a bonus in the number of dwelling units permitted by the underlying land use district (see LUC 20.20.010 or LUC 20.25H.045 for sites in the Critical Areas Overlay District).

2. Bonus Decision Criteria. The City may approve a bonus in the number of dwelling units allowed by no more than 10 percent over the base density for proposals complying with this subsection A.2. Base density shall be determined on sites with critical areas or critical area buffers pursuant to LUC 20.25H.045. Base density on all other sites shall be determined based on the gross land area of the property excluding either that area utilized for traffic circulation roads or 20 percent, whichever is less, if:

   a. The design of the development offsets the impact of the increase in density; and

   b. The increase in density is compatible with existing uses in the immediate vicinity of the subject property.

3. Senior Citizen Dwelling. An additional 10 percent density bonus may be approved for senior citizen dwellings if the criteria in paragraph A.2 of this section are met and if the average dwelling unit size does not exceed 600 square feet.

B. Height.

The applicant may request a modification of height from that allowed by the land use district, provided topography and arrangement of structures does not unreasonably impair primary scenic views (e.g., mountains, lakes, unique skylines) of the surrounding area, as compared to lot-by-lot development. Proposals earning bonus density pursuant to 20.30D.165 may only receive an increase in height if the requirements of 20.30D.165.A.2 are met, considering the impact of increased height.

C. Other.

The City may approve a modification of any provision of the Land Use Code, except as provided in LUC 20.30D.170, if the resulting site development complies with the criteria of this part.

Section 13. A new Section 20.30D.167 of the Bellevue Land Use Code is hereby added as follows:

20.30D.167 Planned Unit Development – Additional Bonus Density for Demonstration Projects.

A. Purpose. The city desires to offer incentives to property owners to develop multi-unit residential projects with site features and site designs that minimize impacts to critical area functions and values. Many of these techniques are new, and their effectiveness is uncertain. The City desires additional information about the impact of these design techniques and features, to determine the appropriate amount of density bonus and other incentives to offer for their use, and to determine what, if any, design features are required to offset the impact of the increased density. Demonstration projects are mechanisms to allow the city to gather such information prior to making additional density available to all projects.

B. Eligible Sites. Demonstration projects will only be authorized on sites of 5 acres or more.

C. Applicable Procedure. A demonstration project will be approved as part of the PUD approval for the underlying proposal.

D. Additional Bonus. The City may authorize additional bonus density, up to 30 percent of the base density, for proposals including additional Conservation Design Features above the amount required in Section 20.30D.160.A. Density shall be based on the square footage credit earned divided by the minimum lot size of the underlying land use district. Bonus may be approved if the proposal meets the criteria of 20.30D.165.A.2.a and A.2.b.

Section 14. Section 20.30D.170 of the Bellevue Land Use Code is hereby amended as follows:

20.30D.170 Planned Unit Development plan – Limitation on authority to modify zoning.

The following provisions of the Land Use Code may not be modified pursuant to LUC 20.30D.165:

A. Any provision of this Part 20.30D, Planned Unit Development; or

B. Any provision of LUC 20.10.440, Uses in Land Use Districts; or

C. Any provision of Part 20.25E LUC, the Shoreline Overlay District, however, requests for modifications to the requirements of Part 20.25E, where allowed under the provisions of that Part, may be considered together with an application for a Planned Unit Development; or

D. Any provision of the Land Use Code which specifically states that it is not subject to modification; or

E. The procedural, enforcement and administrative provisions of the Land Use Code or any other applicable City Code; or

F. Any provision of Part 20.25H LUC, the Critical Areas Overlay District, except as specifically provided for in that part, however, requests for modifications to the requirements of Part 20.25H, where allowed under the provisions of that Part, may be considered together with an application for a Planned Unit Development.

Section 15. Section 20.30D.200 of the Bellevue Land Use Code is hereby amended as follows:

20.30D.200 Planned Unit Development plan – Effect of approval.

A. Recording Required. The approval of the Planned Unit Development plan constitutes the City's acceptance of the general project, including its density, intensity, arrangement and design. Upon final Planned Unit Development approval that is not merged with a subdivision, the Department of Planning and Community Development will forward an approved Planned Unit Development to the King County Department of Records and Elections for recording. No administrative approval of a Planned Unit Development is deemed final until the Planned Unit

Development is recorded and proof of recording is received by the Department of Planning and Community Development. See Chapter 20.45 LUC for recording requirements of Planned Unit Developments merged with subdivisions.

B. Planned Unit Development in the Critical Area Overlay District. Where a Planned Unit Development within the critical area overlay district is not merged with a subdivision, the Planned Unit Development recorded under this section designated on the face of the final document an Native Growth Protection Easement(s) (NGPE). The NGPE(s) shall contain all critical areas, critical area buffers, and retained significant trees. The final Planned Unit Development shall contain the following restrictions for use, development and disturbance of the NGPE in a format approved by the City Attorney:

1. An assurance that: the NGPE will be kept free from all development and disturbance except where allowed or required for habitat improvement projects, vegetation management, and new or expanded city parks pursuant to LUC 20.25H.070; and that native vegetation, existing topography, and other natural features will be preserved for the purpose of preventing harm to property and the environment, including, but not limited to, controlling surface water runoff and erosion, maintaining slope stability, buffering and protecting plants and animal habitat;

2 The right of the City of Bellevue to enforce the terms of the restriction; and

3. A management plan for the NGPE designating future management responsibility.

Section 16. Section 20.30D.250 of the Bellevue Land Use Code is hereby amended as follows:

20.30D.250 Planned Unit Development plan – Phased development.

If developed in phases, each phase of an approved Planned Unit Development must contain the required number of parking spaces, the required open space, recreation space, landscaping, utility areas necessary to create a desirable and stable environment pending completion of the total Planned Unit Development as approved. Each phase must also contain any of the approved conservation factor project design features necessary to support bonus density constructed in that phase.

Section 17. This ordinance shall take effect on December 1, 2005.

PASSED by the City Council this _____ day of _____, 2005, and signed in authentication of its passage this _____ day of _____, 2005.

(SEAL)

_____
Connie B. Marshall, Mayor

Approved as to form:

_____
Lori M. Riordan, City Attorney

Attest:

_____
Myrna L. Basich, City Clerk

Published

APPENDIX B

City of Bellevue
Proposed City Programs

City of Bellevue

MEMORANDUM

CITY PROGRAMS ALTERNATIVE

May 20, 2005

This proposal is a product of the City of Bellevue's Critical Areas update process, and it represents one of two alternative strategies that the City proposes for meeting the requirements of 1995 amendments to the Washington State Growth Management Act.

The City Programs Alternative assumes that the major component of the City's response to the Growth Management Act requirement to update critical area policies and regulations considering best available science consists of a programmatic response. The following programs and investments would be undertaken by the City, in lieu of making substantial amendments to the City's existing critical area regulations in the Land Use Code (20.25H). It is assumed, however, that the City would amend the regulations as outlined in the "Regulatory Alternative" as they pertain to geologic hazards. The City Programs Alternative does not contain programs or investments targeted to those hazards.

The program alternative is broken into 4 main categories:

Acquisition
Rehabilitation/Maintenance
Education/Stewardship
Monitoring

Additional detail about the focus of each element of the program, and an assumed level of investment or target to be achieved through the program over time, is provided in the table that follows.

City of Bellevue

MEMORANDUM

City Programs Alternative Details

Category	Program	Purpose/Goal	Level of Investment	Target
Acquisition	Stream acquisition	Replace over time the acreage that would have been regulated by expanded buffers; focus on connectivity to also serve wildlife function	As necessary to meet target over redevelopment timeframe of 50 years	207acres
	Wetlands acquisition			30 acres
	Shoreline acquisition			Lake Sammamish – 5.89 acres Lake Washington – 7.35 acres
Rehabilitation/ Maintenance	Projects under this element of the City Programs Alternative include: • Streamside buffer, wetland, wetland buffer and shoreline rehabilitation projects (i.e. enhanced native plantings, removal of invasive species, removal of hardened shorelines) designed to maintain or enhance existing functions and values on property owned or controlled by the City; • In-stream enhancement projects (i.e. placement of large woody debris; removal of fine sediments); • Fish passage barrier removal; • Water quality improvement projects	Improve function of property in city ownership, and as acquired over time. Once rehabilitation projects performed, include sufficient maintenance dollars to retain value of the project over time; Improve in-stream habitat and remove fish barriers; Improve/maintain water quality and respond to flood control issues as needed	Total amount available: $1,493,000 annually; allocated as follows: Stormwater catchbasin cleaning -- $445,000 Oil/water separator maintenance -- $8000 Remainder ($1,040,000) to be allocated among critical areas based on assessment of risk to particular area if development regulations are not amended. See attachment 1 for estimated rehabilitation project costs	

Category	Program	Purpose/Goal	Level of Investment	Target
Education/ Stewardship	Efforts within this aspect of the City Programs Alternative include: • Private stewardship programs (efforts to encourage and offset costs for rehabilitation of critical areas on private property) Includes money for native plantings and technical assistance for rehabilitation projects • Education programs to educate critical area property owners and general citizenry about values of critical areas; school and community outreach programs; and volunteer coordination programs to assist with planned public or private rehabilitation projects	Increase incentives for private property owners to better manage the critical areas on their property. Includes City-provided technical assistance, native plant materials, and waived permit fees Continue community education and outreach to maintain interest in and support for City's environmental stewardship efforts	Total amount available: $1,028,000 annually, allocated as follows: Private stewardship programs -- $514,000 See attachment 1 for rehabilitation project cost estimates Education programs -- $514,000	
Monitoring	Monitoring program to include the following elements. Monitoring timeline for each below indicator to be established, some annual, some less frequent: **Streams** • Velocities • Buffer widths and contiguity • Biological sampling (diatoms or benthic index) • Temperature	Establish key baselines to assess effectiveness of City Program Alternative over time; will provide inputs into next required critical areas update	As necessary to fund described program	

Category	Program	Purpose/Goal	Level of Investment	Target
	Wetlands • Inventory and type city-owned • Gather data from new typed privately-owned • Biological sampling • Buffer widths and contiguity **Shorelines** • Prepare shorelines inventory required for Shoreline Management Act update **Wildlife (upland habitat)** • Prepare landscape analysis; focusing on connectivity **Other** • Retain and track utilization data for education and stewardship programs			