

# CITY OF KIRKLAND SENSITIVE AREAS RECOMMENDATIONS REPORT

A Technical Issue Paper prepared for the Kirkland Department of Planning & Community  
Development

Prepared by Adolfson Associates, Inc., 31 August 1998

## 1.0 Introduction

In February of 1997, a wetlands and buffer modification moratorium was adopted in the City of Kirkland through Interim Ordinance No. 3575 (*An Ordinance of the City of Kirkland Relating to Interim Regulation of Development in Wetlands, Wetland Buffers, Stream Buffers, and Minor Lake Buffers*). This interim ordinance limited proposed development impacts to areas outside of City-regulated wetlands and regulated buffers. The adoption of this interim ordinance was a result of public concern over several city projects that involved wetland alteration and/or buffer modification. Public concern indicated that wetlands and their buffers, while regulated by the Kirkland Zoning Code Chapter 90 (Drainage Basins), were not adequately protected from modification and alteration. The City sponsored several public meetings and workshops during the summer of 1997 to identify issues of importance and to evaluate wetland, stream and buffer resources within the City of Kirkland. As a result of these meetings and workshops, several studies were undertaken to investigate the existing environmental resources within the City of Kirkland and to evaluate a possible drainage basin approach to sensitive areas regulations. This issue paper is part of the evaluation to determine the scientific basis upon which to define improved sensitive areas regulations.

## 2.0 Goals and Objectives

The goals and objectives of this document are to evaluate existing information on wetlands, streams, buffers, and important wildlife habitat resources within the City of Kirkland and to determine recommendations for the protection and preservation of these resources. Existing information includes our regional knowledge of the City environment and the resource inventory prepared by The Watershed Company titled *Kirkland's Streams, Wetlands, and Wildlife Study* (July 1998). The study describes streams, wetlands and wildlife corridors and habitats within each of the drainage basins occurring within the City of Kirkland. Regulatory recommendations for streams, wetlands, buffers, and important wildlife habitats will be based upon and tailored to the types and protection needs of natural resource features found within the City of Kirkland. In addition, non-regulatory recommendations that may benefit environmental resources will be discussed in this document. Streams, wetlands, buffers and wildlife habitat conservation areas are described in detail below, following the description of the drainage basin approach.

## 3.0 Drainage Basin Approach

The City of Kirkland is an urbanizing community located on the eastern shoreline of Lake Washington. Several large perennial streams as well as smaller spring-fed brooks are located within the City. All of these streams drain westerly towards Lake Washington. Several large wetlands are located within Kirkland, including shoreline wetlands on Lake Washington and two important headwater lakes (i.e., Totem Lake and Forbes Lake) flowing to salmonid-bearing streams. A number

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of other important wetlands are also found throughout the City. Further, significant wildlife corridors are situated along and through the City's streams and wetlands and within certain municipal parks. Each of these streams and associated wetlands is located in distinctly different drainage basins within the City of Kirkland. Due to the distinct nature of these separate basins and the need for specific protection measures within the City, a watershed-based or drainage basin-based approach was recommended to differentiate between drainage basins. Existing regulations for environmentally sensitive areas outlined in Chapter 90 (Drainage Basins) do not differentiate between drainage basins.

Eight drainage basins were identified in the City of Kirkland and evaluated by The Watershed Company in the study. Listed from south to north, these drainage basins are: 1) Yarrow Creek Basin, 2) Cochran Springs Creek Basin, 3) Houghton Slope Basin, 4) Carillon Creek Basin, 5) Moss Bay Basin, 6) Kirkland Slope Basin, 7) Forbes Creek Basin, and 8) Juanita Creek Basin. In addition, several other drainages were identified in the study for proposed annexation areas to the north. The Urban Drainage Basins are located in the central part of the City of Kirkland and are defined by The Watershed Company to include Moss Bay Basin, Kirkland Slope Basin, and Houghton Slope Basin. A total of four small streams are located in The Urban Drainage Basins; these are: Northwest College Creek, Houghton Creek, Everest Creek, and Moss Bay Creek. Most of the urban drainages, as identified, flow through pipes for considerable distances and enter Lake Washington at the outfall of these pipes.

Due to their more significant functions and values, the Primary Basins within the City of Kirkland were determined to be all the major drainages, excluding the Urban Drainage Basins. Specifically, the Primary Basins are the following five basins: 1) Yarrow Creek Basin, 2) Cochran Springs Basin, 3) Carillon Creek Basin, 4) Forbes Creek Basin, and 5) Juanita Creek Basin. Kirkland's largest and most important streams are Juanita Creek and Forbes Creek. Both provide critical wildlife corridors and are primary habitat for cutthroat trout and coho salmon within the City. The size of their drainage basins and the numerous substantial wetlands associated with each stream make these basins especially important for stormwater control and water quality maintenance for Lake Washington. In addition, a large lakeshore wetland is associated with the mouth of Forbes Creek at Juanita Bay Park. Other important lakeshore wetlands are located at the mouth of Yarrow Creek and Cochran Springs Creek. Although smaller, Carillon Creek and Cochran Springs Creek are considered critical spring-fed streams. The Watershed Company identified Everest Creek as a critical smaller creek due to its groundwater contributions. However, since the stream is already largely piped, we recommend that all of the Urban Drainage Basins, including Everest Creek, be considered Secondary Basins.

In summary, we recommend that streams and wetlands located within Primary Basins be given a greater degree of protection and preservation than streams and wetlands in the Secondary Basins. This may include greater buffer widths, more restrictive buffer reduction standards or higher mitigation ratios.

#### **4.0 Streams**

Streams within the City of Kirkland are generally those waters in channels with a defined bed and bank. These resources may be perennial or seasonal and may or may not support fish populations. The definition of stream does not include roadside ditches unless these ditches convey streams which have been previously re-located. Kirkland Zoning Code Chapter 90 (Drainage Basins) currently classifies streams into three classes: Class A, B, and C. The Watershed Company and AAI recommend that this classification system remain in use within the City since it provides good separation between high and low quality streams. Class A streams will continue to be the most

important streams in Kirkland and Class C streams the least important. By using a three-tiered system for stream rating, higher value streams may be separated more distinctly from lower value streams. Class A, B, and C streams in the City of Kirkland are generally equivalent to Type 3, 4, and 5 waters (respectively) as defined by the State of Washington in the Washington Hydraulic Code and used by Department of Natural Resources (DNR). Kirkland has no streams that meet the State definition of Type 1 (Shorelines of the States) or Type 2 waters (streams wider than 20 feet with significant fish populations).

Buffers for streams provide important zones of preservation and protection. Stream buffers function in stream bank stabilization, removal of sediments, provision of shade and temperature modification, production of large woody debris, and water quality improvement. Effective buffers are well-vegetated and are of a sufficient width to provide maximum function to the stream. A recent review of research conducted on riparian buffer functions indicates that buffer widths between 75 and 100 feet provide maximum long-term protection of stream function and values (Castelle and Johnson, 1997). After consideration of the existing stream resources in the City, as well as the current research available on riparian buffers, we recommend that streams be afforded buffers that are based on both the class of the stream and on the stream's context (i.e., location in a Primary or Secondary Basin). This rationale is based upon the need to protect water quality within the City of Kirkland and Lake Washington, as well as the need to protect and enhance fish habitat. Scientific evidence indicates that buffers of less than 25 feet do not adequately protect stream water quality or fish habitat. We therefore recommend that all streams within the City of Kirkland, regardless of watershed or basin, be afforded a standard buffer of 25 feet or greater.

For Class A Streams, which occur only in Primary Basins, are used by salmonids, and are the highest quality streams within the City of Kirkland; a standard buffer of 75 feet in width is recommended. For Class B streams, which are not used by salmonids but contain perennial flow; the recommended standard buffer width is 60-feet in Primary Basins and 50-feet in Secondary Basins. For Class C Streams, which have seasonal flow; the recommended standard buffer width is 35-feet in Primary Basins and 25-feet in Secondary Basins. These buffer recommendations reflect the importance of protecting water quality and salmonid habitat within the Puget Sound basin. Due to the proposed listing by the National Marine Fisheries Service of Chinook salmon as a threatened species, we anticipate that stricter regulations in regard to the protection of salmonid habitat will be implemented in western Washington over the next few years.

In addition to the stream buffer, a building setback from the buffer's outer boundary is also recommended on all stream and wetland buffers. This additional setback is recommended to be 10 feet. The purpose of the building setback is to allow space for disturbance typically occurring around buildings and structures during construction and maintenance. We recommend that the 10-foot building setback be required on all stream and wetland buffers to protect buffer integrity. Modification or reduction in the building setback should not be allowed, except in cases where the applicant can demonstrate undue hardship through the reasonable use exemption process.

Modifications or alterations proposed to stream buffers may be allowed within Primary and Secondary Basins on a case-by-case basis. However, since stream buffer modifications can be inappropriately applied, sometimes resulting in overall loss of stream buffer function, we recommend that buffer modification only be allowed if buffer "averaging" or buffer enhancement is proposed. Research indicates that, in many cases, narrower well-vegetated stream buffers may function at the same level as wider poorly-vegetated stream buffers. Therefore, we recommend that modifications to standard stream buffers should be required to include either enhancement to improve the function and value of the remaining buffer or provide additional buffer area in another location on property.

("averaging"). The applicant for a City permit or SEPA review should bear the burden of proof to demonstrate that the buffer enhancement or averaging proposal results in no net loss of stream buffer function. To further protect stream resources, we recommend that buffers not be reduced by more than one-third of the required standard buffer in any case. These requirements for stream buffer modifications would result in a minimum buffer on Class C streams of approximately 23 feet in Primary Basins and 17 feet in Secondary Basins. Note that an additional 10-foot building setback would also be required.

For example, Forbes Creek (a stream within a Primary Basin) would be classified a Class A Stream in the City of Kirkland. A 75-foot buffer plus a 10-foot building setback would be required. A buffer reduction of up to 25 feet may be allowed on this stream given that buffer enhancements or averaging is proposed; therefore, a minimum buffer of 50-feet plus a 10-foot building setback would be required on Forbes Creek. On the other hand, a small Class C stream in the Urban Drainages Area would be afforded a minimum modified buffer of 17 feet plus the 10-foot building setback as long as buffer enhancement or averaging were proposed.

## 5.0 Wetlands

Wetlands in the City of Kirkland are those areas meeting the definition of wetlands in the *Washington State Wetlands Identification and Delineation Manual* (Washington Department of Ecology, 1997). Wetlands may include wet pastures, forested swamps, marshes, and shallow ponds. They provide functions in wildlife habitat, stormwater retention and floodwater abatement, water quality improvement, groundwater recharge, recreational/ educational opportunities, and shoreline protection. In the current Zoning Code Chapter 90 (Drainage Basins), wetlands are classified into two types. We recommend that regulated wetlands be classified into three types (Type 1, 2, and 3 Wetlands) to more clearly separate high and low quality wetland systems. Type 1 Wetlands would be identical to Category I wetlands as defined by the Washington State Department of Ecology. Therefore, the most important wetlands according to the State would be identical to the most important wetlands in Kirkland. Type 1 Wetlands will likely include those wetlands associated with State Shorelines (Lake Washington) such as shoreline wetlands in Yarrow Bay and the mouth of Forbes Creek and those providing habitat to federally-listed wildlife species. The *Kirkland's Streams, Wetlands, and Wildlife Study* (July 1998) describes lake shore wetlands as those of greatest importance within the City of Kirkland. Type 2 and 3 Wetlands are recommended to be determined according to the habitat evaluation forms used by the City; Type 2 Wetlands are those wetlands providing significant wildlife habitat as determined by scoring 22 or more habitat points on the evaluation forms. Type 3 Wetlands are those wetlands scoring less than 22 points on the evaluation forms. Although the wetland habitat evaluation form has not been updated from its old version, the break point between Type 2 and 3 Wetlands (instead of between Type I and II wetlands as is currently used) would remain valid.

We recommend that the City set minimum wetland sizes for regulation of Type 3 Wetlands: those wetlands of lowest value in the City of Kirkland. In Primary Basins, we recommend that Type 3 Wetlands smaller than 1,000 square feet in area not be regulated. In Secondary Basins, we recommend that Type 3 Wetlands smaller than 2,500 square feet not be regulated. These minimum wetland sizes reflect our best scientific understanding of how wetland functions and values correlate with wetland area. These very small wetland areas do not typically provide important wetland functions and values and need not be regulated as environmentally critical areas within the City. Exceptions to this size rule would include bogs, fens, or other wetlands supporting threatened or

endangered plant or animal species; all of which either do not occur in the City of Kirkland or would not be rated a Type 3 Wetland in the City, but would be considered Type 2 Wetlands.

Wetland buffers are important transitional zones that protect the physical, chemical, and biological qualities of the wetland. Buffers serve to shield wetland habitats from human encroachment, deter harmful intrusion into the wetlands, provide shade for surface water temperature, control stormwater runoff into the wetland, reduce sediment transport, remove waterborne contaminants, and provide valuable wildlife habitat. Determination of wetland buffer widths appropriate to protect wetland functions and values has been studied in great detail by the Washington Department of Ecology (*Wetland Buffers: Use and Effectiveness*; Castelle et al., 1992). While wetland buffer effectiveness increases with buffer width, a buffer width of 50 feet or greater is considered adequate protection for most wetlands, depending upon adjacent land use and wetland sensitivity. We recommend that wetland buffer requirements in the City of Kirkland be dependent upon wetland rating and basin type. Standard wetland buffers in Primary Basins should be wider than buffers in Secondary Basins. Recommended wetland buffers for Primary Basins are 100, 75 and 50 feet for Type 1, 2, and 3 Wetlands, respectively. Recommended wetland buffers for Secondary Basins are 75, 50 and 25 feet for Type 1, 2, and 3 Wetlands. These recommended wetland buffers would provide a 50-foot or wider area for all wetlands in the City of Kirkland with the exception of the lowest quality wetlands (Type 3) in the Secondary Basins. Type 3 Wetlands in the Secondary Basins are generally small disturbed areas in the urban environment that do not provide significant wildlife habitat. Although these wetlands are useful for water quality improvement and stormwater retention, we recommend that a 25 foot buffer is adequate to protect these functions and values within the City of Kirkland. As with streams described above, we recommend that a 10-foot building setback be required from the upland boundary of every wetland buffer.

For example, a Type 1 Wetland in a Primary Basin, such as Yarrow Bay wetlands, would be afforded a 100 foot buffer. A 10-foot building setback would be required in addition to the 100-foot buffer. Under the current regulations, Type I wetlands, including Yarrow Bay, would be afforded a 50-foot buffer without a building setback. Using these recommendations, a Type 3 Wetland in a Secondary Basin (e.g., Moss Bay Basin) would be afforded a 25-foot buffer with a 10-foot building setback. Under the current rules, this wetland would be considered a Type II wetland with a 25-foot buffer and no building setback area. The result of this new drainage basin approach, both in Primary Basins as well as the Secondary Basins, would be to increase wetland buffer requirements and offer greater protection to wetlands in the City regardless of type.

Modification of wetlands and their buffers are recommended to be more restrictive for wetlands within the five Primary Basins. Land surface modification and improvements within Type 1 Wetlands located in Primary Basins should be avoided in all but those cases specifically meeting the decisional criteria outlined. To further minimize impacts to high quality wetlands, we recommend that no more than five percent of the portion of a Type 1 Wetland located on the site may be modified by any development proposal. No more than 10 percent of the portion of a Type 2 Wetland located on a site in a Primary Basin, or 25 percent of the portion of a Type 2 Wetland located on a site in a Secondary Basin should be modified. For Type 3 Wetlands, we recommend that no more than 50 percent of the portion located on a site in a Primary Basin, and all of the area located on a site in a Secondary Basin may be proposed for modification.

When impacts to wetlands are unavoidable, compensatory wetland mitigation must be provided in the form of wetland creation (from non-wetland areas) or wetland restoration (from uplands that were formerly wetlands prior to historic alteration). Mitigation in the form of wetland enhancement (improving the condition of existing wetlands) should only be allowed as a small part of the entire

mitigation package that focuses on wetland creation or restoration. This recommendation is in keeping with the national policy of "no net loss" of wetland area. We recommend that no more than 1/3 of the mitigation proposal be wetland enhancement in Primary Basins and no more than 1/2 in Secondary Basins.

Compensatory mitigation ratios for Primary Basins are recommended to be higher than ratios in Secondary Basins to minimize impacts to higher quality wetlands. We recommend that mitigation ratios be contingent upon wetland rating (Type 1, 2, or 3) and basin classification (Primary or Secondary) rather than by wetland habitat type (forested, scrub-shrub, etc.). Therefore, we propose that wetland mitigation ratios within Primary Basins range from 3:1 in Type 1 Wetlands to 1.5:1 for Type 3 Wetlands. Ratios within Secondary Basins are recommended to range from 3:1 for Type 1 Wetlands to 1:1 for Type 3 Wetlands. We recommend that on-site mitigation be strongly preferred over off-site mitigation in most cases. This will maintain water quality improvement functions and stormwater retention functions within the same area or sub-basin as wetland impacts have occurred, thereby minimizing effects to the basin.

Similar to the stream buffer modification recommendations, we recommend that modification of wetland buffers not exceed one-third of the buffer width, regardless of basin designation, as long as buffer enhancement or averaging is provided. We recommend that the 10-foot building setback be required from modified buffers as well as from standard buffers. For Type 3 Wetlands, modification within Primary and Secondary Basins could result in a minimum buffer of 34 feet (rounded for practicality) and 17 feet, respectively. In our professional experience, Type 3 Wetlands identified within the City of Kirkland will include low value urban wetlands, ditched wetlands, and other wet areas which technically meet the definition of wetland but may not, in fact, provide significant wetland functions and values. Further, many of these low value wetlands are located on private residential properties or have buffers that have already been developed or are degraded. Given the urban nature of the Type 3 Wetlands likely to be encountered in the City of Kirkland, especially those in Secondary Basins, we recommend that wetland buffers proposed for modification include either buffer averaging or enhancement to improve the quality of the modified buffer. Enhancement of narrow buffers may provide greater buffer function and value than wider, degraded wetland buffers. The current regulations allow for wetland buffer modification on a case-by-case basis if the decisional criteria in Zoning Code Chapter 90 are met. These new recommendations for wetland buffer modifications are thought to provide more clear guidance to applicants on the buffer modification process and to limit modification of buffers on high quality wetlands in the Primary Basins.

## **6.0 Significant Habitat Areas**

We recommend that the definition of Significant Habitat Areas, as currently defined in Zoning Code Chapter 90, not be changed for the interim ordinance but be considered for change in the adoption of the final regulations for critical areas in the City in 1999. During the formulation of final regulations, we recommend that Kirkland consider designating Wildlife Habitat Conservation Areas, defined as any area of known roosting and/or nesting of a federally-listed or state-listed threatened or endangered wildlife species. These areas also should include species and habitats of local importance. Federal and state-listed threatened or endangered species potentially occurring within the City include bald eagle and potentially Chinook salmon (proposed for federal listing). Locally important wildlife species and habitats might be specifically defined as red-tailed hawk nests, pileated woodpecker nests, osprey nests, and great blue heron roosts and rookeries. At present, wildlife habitat conservation areas are not protected in the Kirkland Zoning Code. With the final regulation amendments, we recommend adding language affording protection to these areas that constitute

important natural resources within an urbanizing environment. Recommendations for buffer setbacks from active nests, rookeries, and roosting sites, as well as seasonal limitations to construction activities should be set forth in the final regulations.

## **7.0 Conclusion**

Adolphson Associates, Inc. was retained to provide guidance to the City of Kirkland in updating the City sensitive areas regulations. As part of this effort, The Watershed Company conducted a natural resource inventory describing wetlands, streams, and wildlife habitat areas within the City and prepared a report titled *Kirkland's Streams, Wetlands, and Wildlife Study* (July 1998). A drainage basin or watershed approach was used to evaluate sensitive areas in Kirkland and to determine Primary and Secondary Basins.

The City is comprised of eight drainage basins that have been evaluated and prioritized for function and values. Five drainage basins (Yarrow Creek Basin, Cochran Springs Creek Basin, Carillon Creek Basin, Forbes Creek Basin and Juanita Creek Basin) are considered the Primary Basins due to their large flow, groundwater source, and presence of fish or large basin area. The Urban Drainage Basins (comprised of Moss Bay Basin, Kirkland Slope Basin and Houghton Slope Basin) are not considered primary basins. The streams in the Urban Drainage Basins are largely piped, lack significant wetland or wildlife habitat, and are closest to the urban city center. These three watersheds are referred to as the Secondary Basins.

We recommend that streams be classified as Class A, B, and C Streams as currently defined in Chapter 90 (Drainage Basins). Stream buffer widths should be applied according to stream class and basin type. We recommend that wetlands be classified as Type 1, 2, and 3 Wetlands. Larger buffers and higher mitigation ratios are recommended for wetlands located in Primary Basins. Stricter rules for buffer modifications and other development activities are also proposed for streams and wetlands within Primary Basins. Provisions for determining significant habitat areas continue to be defined through Chapter 90 for the interim ordinance, but are recommended to be updated in the final sensitive areas regulations to be adopted in 1999.

In addition to the standard regulatory framework described in this paper, several non-regulatory, innovative approaches may also be considered by the City of Kirkland for the protection and preservation of wetlands, streams, and significant habitat areas. Innovative approaches may include establishing a "fee-in-lieu" program for compensatory wetland mitigation, or allowing off-site density transfers for highly sensitive sites. A "fee-in-lieu" program provides a mechanism by which applicants may contribute to a City-sponsored wetland acquisition or restoration fund in lieu of compensatory mitigation for adverse impacts to wetlands of low value. Use of the "fee-in-lieu" program should be limited to Class 3 Wetlands in Secondary Basins. Funds from the program should be applied to wetland restoration and acquisitions of local importance. Transfer of Development Rights, or TDRs, would transfer density credits from highly sensitive sites to non-sensitive properties. This approach would more effectively preserve sensitive areas than allowing site development through the Reasonable Use provision.

In conclusion, we recommend that the potential effectiveness of innovative approaches as well as the likely regulatory effects of the new interim regulations on sensitive areas in the City of Kirkland be studied and considered prior to adoption of the final sensitive areas ordinance in 1999.