Appendix A

Appendix A

King County's Justification for Less Than NOAA-Recommended BiOp Buffers

Summary and Conclusion

FEMA has requested justification for King County's regulatory buffers which are less than buffers required by NOAA in their 2008 BiOp. In response, we have assessed the basis, limits and applicability of buffers recommended by Knutson and Naef (1997), the document cited as the basis for NOAA's BiOp buffers, and King County.

Among several concerns with use of the Knutson and Naef recommendations, we could not find an explanation as to why Knutson and Naef's recommendations were selected as the basis for the BiOP buffers. Also, the literature cited in Knutson and Naef is not contemporary—1994 is the most recent paper cited—and as such does not appear to represent contemporary best available science. The Knutson and Naef paper provided no clear explanation for their specific buffer width recommendations and their recommendations were generalized for both fish and wildlife, with no specific discussion of the characteristics that provide benefits for fish. Moreover, they made a point of noting that their recommendations were not intended to serve as regulations and that specific watershed conditions should be considered.

In contrast, King County riparian buffer requirements in both the Critical Areas Ordinance (CAO) (2004) and the proposed Shoreline Master Program update (King County Council passed in 2010) were derived from best available science (BAS) (BAS *circa* 2004) using contemporary science in combination with both comprehensive reach and watershed scale information on ecology, biology, and land use conditions accumulated over several decades. The County's BAS was peer reviewed several times and met challenges during legal proceedings, as far up as the Washington State Court of Appeals.

Under its CAO, King County 165 foot regulatory buffers equivalent to or slightly more than one site potential tree height (SPTH) are applied to all salmon bearing rural streams and select urban streams that exist in a high condition watershed. Using FEMAT (1993) vegetation effectiveness curves, King County's buffers provide similar functionality to the larger buffers NOAA is requiring in their Reasonable and Prudent Alternatives. In a very limited area—6.8 percent of King County's floodplain jurisdiction—smaller (115-foot) urban buffers are applied. Of these urban areas, the majority are in Potential Annexation Areas (PAAs) above the Snoqualmie Falls, above which ESA-listed salmonids are absent, with small amounts either in PAAs elsewhere or in a highly developed and highly constrained small slivers of urban land. As a result of their proximity to cities and a long history of intensive land development, these urban floodplains are generally either highly altered or exist in highly altered landscape context and thus are not highly functioning floodplains.

It is important to note that King County's required buffers are but one part of a science-based, highly integrated, comprehensive, and protective set of environmental regulations. The regulations are complemented by many significant plans, programs, and capital investments operating at multiple scales and balancing multiple competing objectives to protect and restore habitat and ecological processes that sustain them. King County's efforts are supported by contemporary science and, to our knowledge, equal or exceed protection required by any other local government in the United States. As such, they are protecting and restoring the County's

environment to a greater degree than ever before and are considered sufficient for meeting FEMA's floodplain protection needs, even though they are less than those recommended in the NOAA BiOp.

Introduction

The Federal Emergency Management Agency (FEMA) has recently requested (February 18, 2011 letter from John Graves, Senior NFIP Specialist to Mark Isaacson, Director, King County Water and Land Resources Division) King County's explanation for regulatory riparian buffers smaller than those required in the National Oceanic and Atmospheric Agency's (NOAA) 2008 Biological Opinion (BiOp) for the National Flood Insurance Program (NFIP) as carried out in Puget Sound. NOAA's buffers are considerably wider than King County's or any other regulatory buffers developed under Washington State Growth Management Act for protection of critical areas.

The following is King County's assessment of the basis, limitations and applicability of both NOAA's and King County's buffer standards and associated science related to ESA listed salmonid habitat protection in King County.

NOAA's BiOp buffers – basis, limitations and applicability

NOAA's 2008 (and 2009 errata) BiOp cites Knutson and Naef (1997) as the basis for setting minimum regulatory buffer widths in Reasonable and Prudent Alternative (RPA) Element 3 – Floodplain Management Criteria. Knutson and Naef's paper is a literature review and synthesis that presents statewide riparian management recommendations developed by the Washington Department of Fish and Wildlife (WDFW) based on best available science at the time. Table 3 of their report, reproduced below, presents their recommendations:

Table 3. Standard recommended Riparian Habitat Area (RHA) widths for areas with typed and non-typed streams. If the 100-year floodplain exceeds these widths, the RHA width should extend to the outer edge of the 100-year floodplain.

Stream Type	Recommended RHA widths in meters (feet)
Type 1 and 2 streams; or Shorelines of the State, Shorelines of Statewide Significance	76 (250)
Type 3 streams; or other perennial or fish bearing streams 1.5-6.1 m (5-20 ft) wide	61 (200)
Type 3 streams; or other perennial or fish bearing streams <1.5 m (5 ft) wide	46 (150)
Type 4 and 5 streams; or intermittent streams and washes with low mass wasting* potential	46 (150)
Type 4 and 5 streams; or intermittent streams and washes with high mass wasting* potential	69 (225)

*Mass wasting is a general term for a variety of processes by which large masses of rock or earth material are moved downslope by gravity, either slowly or quickly.

NOAA's use of Knutson and Naef as the basis for setting regulatory buffers raises several important issues, including:

1. Knutson and Naef provided no explicit explanation for how they derived their recommended buffer widths, thus there is no way of knowing what the scientific basis was for those widths and how it might have related to critical fish habitat, as opposed to needs of other creatures.
2. The most recent literature on which the management recommendations were based was published in 1994 (see Appendices B, C, and D in Knutson and Naef 1997). Thus, the paper was written well before a considerable body of more contemporary science related to protection was developed, reviewed, and published.
3. Knutson and Naef identify significant caveats about the use of their recommendations, including that they:
    - were generalized in order to address both fish and wildlife needs,
    - were not nor do they appear to have been intended for use as regulations,
    - were not static, site-specific or based on other land use objectives, and
    - were intended to be updated with new information as it became available.
4. Knutson and Naef recommendations were for buffers that encompass the needs of a wide range of both fish and wildlife species and, to some degree, include transition and upland habitats. Thus their recommendations were for buffers that may be larger than necessary for fish and aquatic habitat protection.
5. The recommendations were meant to be used in a larger context. Knutson and Naef stated that "[i]implementation of these management recommendations should ideally be part of watershed-level analysis and planning in order to best meet the needs of fish and wildlife across the landscape." Their key watershed and landscape planning recommendations included: retaining natural areas in developed landscapes, maintaining rural lands, reducing urban sprawl, compensating for lost habitat, consulting with fish and wildlife professionals, and developing coordinated plans. Specifically, in urban and rural lands they recommended: choose land uses with minimal impacts when near streams, restoring degraded riparian habitat, limiting impervious surfaces, treating stormwater runoff and adopting stormwater guidelines. (Note: King County's environmental protection and restoration measures incorporate <u>all</u> of these recommendations.)

The limitations and caveats noted above may explain why, to our knowledge, the Knutson and Naef recommendations up to this point have never been included in regulations, including by WDFW or any other state entity on their own lands or for planning or permitting purposes on lands over which they have authority, despite being available since 1997. We note that the NOAA has not required them for the approved Forest and Fish Agreement or any Habitat Conservation Plan (HCP) of which we are aware.

In summary, it appears that the recommendations of Knutson and Naef were not meant to be used as regulations without first considering ecological and biological goals and natural and land use conditions of the area to be regulated.

We conclude that the buffer recommendations in Knutson and Naef are used out of context and, because they are generalized for both fish and wildlife needs, may be larger than necessary to meet aquatic needs.

King County's buffers - basis, limitations and applicability

King County's buffers are but one part of a comprehensive environmental protection and restoration strategy for the County. The establishment of the County's current buffers reflects a substantial history of assessment, learning, and adaptation. They also reflect the perspective that environmental regulations alone cannot accomplish all goals and, to be effective, they should be part of a larger comprehensive and integrated strategy that recognizes the role and variability of

natural processes, variability in the distribution of natural resources, including salmon, and the implications of existing development. The strategy includes complementary policies, goals, objectives, programs, education, and capital investments. Furthermore, throughout its development, the King County strategy has prioritized protection of salmonids and their habitats in setting protection levels.

King County's approach to environmental protection and restoration began with its initial Shoreline Master Program (SMP) (SMP 1975), developed in response to the Washington State Shoreline Management Act of 1971. In the mid-1980s, King County adopted its first Comprehensive Plan and initiated stream reconnaissance and basin planning programs. King County adopted its first comprehensive environmental regulations as the Sensitive Areas Ordinance in 1990. The adoption of the Washington State Growth Management Act (GMA) in 1991 and 1992, led to the King County Comprehensive Plan update in 1994. In addition, the King County Flood Hazard Reduction Plan was adopted in 1993 and updated in 2006. These programs produced considerable new environmental information to help guide management, including maps and inventories of wetlands, streams and shorelines, hydrologic and water quality conditions, distributions of important fish and wildlife species, and identification of areas with erosion, flooding, water quality and fish and wildlife problems. They've also resulted in significant capital investment projects and targeted public outreach and education programs to protect and restore habitat, with an emphasis on salmon.

More recently, state-required updates to the King County Comprehensive Plan, CAO, and SMP have all been accomplished, although the SMP awaits final approval by WDOE. Each of these updates entailed the addition of substantial amounts of recent scientific information, detailed characterization of current and future threats to natural resource conditions, and application of appropriate protection and restoration methods all carried out and peer-reviewed by professional scientists.

Early ESA response

As early as the mid- to late 1980s, starting with basin reconnaissance and planning programs, King County has engaged in significant efforts to better understand and remedy the effects of land use on the environment. King County's targeted salmon recovery planning activities started in the late 1990s in response to the then-proposed ESA listing of Puget Sound Chinook salmon in the late 1990s and, later, listings of coastal bull trout, Puget Sound steelhead and southern resident killer whales. King County's initial response to ESA listings included convening a panel of County and non-County senior scientists to conduct a comprehensive review of the consistency of its policies, programs regulations and capital projects with the federal ESA. In 1999, the County produced a report entitled "Return of the Kings," the first comprehensive assessment of the adequacy and shortcomings of all of King County's policies and programs compared to salmon recovery needs.

Tri-County Salmon Recovery Plan

In the late-1990s and early 2000's, King County collaborated with Pierce and Snohomish counties and other local governments to produce the Tri-County Salmon Recovery Plan. The plan included a model set of regulations that were the basis for King County's Critical Areas Ordinance (CAO). The science basis for the Tri-County Plan was peer reviewed and found to be consistent with best available science.

Critical Area Ordinance (CAO)

As noted above, King County first adopted comprehensive regulations for riparian buffers in 1990. These were revised in 2004 and implemented on January 1, 2005, in accordance with the Washington State GMA. The GMA requires that special consideration be given to protection of anadromous fish. Legal requirements for establishing BAS set forth by Washington State were followed (http://apps.leg.wa.gov/wac/default.aspx?cite=365-195&full=true). In 1990, the buffer requirement along salmon-bearing streams was 100 feet. The 2005 CAO increased those to 165-feet and included streams with the potential for salmonids, thus including potential fish-bearing habitat above impassable culverts and other artificial passage barriers.

King County's BAS was developed by a multi-disciplinary team of county scientists. For each type of critical area (eleven were defined), one or more scientists conducted an extensive review and synthesis of the scientific literature describing the structures, functions and values of critical areas, the natural processes that create and sustain them, and currently preferred protection strategies. A peer-review was conducted using national and regional experts and formal response and resolution of peer review comments was made before finalizing and publishing each BAS chapter.

To further understand the implications of critical areas regulations and to better understand how protection levels could be varied based on ecological, biological and land use factors, 61 marine drift cells and 508 freshwater basins were mapped using indicators of biological value (e.g., presence abundance of critical species, including listed and non-listed salmonids, rare or valuable habitats, forest cover) and human constraint (e.g., zoning, bank armoring, roads and other impervious surfaces). A rating factor was applied to increase scores when ESA-listed salmonids were present. (http://your.kingcounty.gov/ddes/cao/PDFs/mapKC-BasinShorelnCond-15051AttachA.pdf; Lucchetti and Moe 2004). The resulting map provides a better understanding of risk associated with the regulations and where levels of protection might vary.

CAO risk assessment

To better understand potential impacts to critical areas and associated resources, especially salmonids, the County conducted a risk assessment of the final regulations. For aquatic areas, the risk assessment concluded that three standards departed from BAS: (1) lack of effective buffers for [full] microclimate control, (2) small buffers on Type O waters, and (3) in the general application of farm planning, inadequately sized buffers and BMPs to provide more than improved water quality benefits. With respect to salmonids, the risk assessment concluded that, when considered in the context of King County's other environmental efforts, the CAO was "… a relatively low incremental risk strategy for protection of salmonids and salmonid habitat forming processes."

CAO Legal Challenges

The only CAO requirement that was successfully challenged was the limit on clearing rural residential properties. In that case, the Washington Court of Appeals acknowledged that the County had substantial scientific support for its regulations, but found that the proposed clearing limits violated a state law on how impact fees must be determined, and declared that clearing limits are a form of impact fee and must be determined on a case-by-case basis. Otherwise, the King County CAO BAS has survived intense technical and legal challenges and, therefore, is arguably the most thoroughly vetted and scrutinized BAS for establishing critical area protection measures in Puget Sound.

Shoreline Master Plan Update

King County's buffers were further assessed in support of the 2010 SMP update. The SMP applies to all marine waters, lakes greater than 20 acres, and rivers and streams with a minimum of 20 cubic feet per second (cfs) mean annual flow. It also pertains to the associated 100-year floodplains of these waterbodies. The SMP is intended to protect natural conditions of shorelines while guiding the location, type, and intensity of water-dependent activities in a manner that is both compatible with existing conditions, and avoids or mitigates impacts of water-dependent uses. In support of the SMP update, several major assessments and products were produced, including:

King County Shoreline Protection and Restoration Plan (October 2010): The Shoreline Protection and Restoration Plan summarizes the methods and results of King County's shoreline analysis with respect to restoration planning, the elements and applicability of the restoration plan, and the ways in which shoreline restoration is expected to occur over time.

King County Shoreline Public Access Plan (October 2010): The Shoreline Public Access Plan includes an inventory of existing formal and informal shoreline public access opportunities in the unincorporated area, and identifies gaps in public access opportunities. The Shoreline Public Access Plan describes King County's priorities for providing new public access to major shorelines in the unincorporated area.

King County Shoreline Cumulative Impacts Assessment (October 2010): The Shoreline Cumulative Impacts Assessment provides a mechanism for examining the potential success of county policies and regulations in meeting the goal of no net loss of shoreline ecological processes and functions.

King County Shoreline Inventory and Characterization (May 2007): The Shoreline Inventory and Characterization includes the data and analytic methods used to develop King County's shoreline inventory and shoreline characterization (including evaluation of existing physical and shoreline ecological processes and functions, public access and recreation, land use and economic development, public facilities and utilities, and archaeological and historic resources). In addition, the Shoreline Inventory and Characterization includes methodologies for cumulative impact analysis associated with shoreline management and comprehensive shoreline restoration planning. Specific data can be found at: http://www.metrokc.gov/shorelines/shorelines-plan-update.aspx.

King County Shoreline Map Folio (October 2010): The Shoreline Map Folio includes all maps produced and referenced as part of the Shoreline Master Program update, with the exception of those maps included in this chapter. All geographic information can be found at: http://www.kingcounty.gov/shorelines/shorelines-plan-update.aspx.

As a result of the above, King County has a comprehensive inventory and rating of natural processes at the reach and watershed scale for all shorelines, a plan guiding public access and use of shorelines and a portfolio of reference maps to guide land use and natural resource decisions. As required by the State, King County assessed the cumulative effects of its plan and concluded that: (1) the SMP results in "no net loss" of shoreline functions and values and, (2) over time, the implementation of the SMP should result in shoreline conditions that are improved or restored relative to current conditions. Informally, WDOE has agreed with our conclusion of no net loss and formal adoption by WDOE is expected by end of 2011.

Watershed (WRIA) Salmon Recovery Plans

The quality and applicability of King County's BAS and buffer standards may be inferred from how they've been used elsewhere. Multi-jurisdictional WRIA salmon recovery plans approved by NOAA Fisheries for King County watersheds did not establish specific buffer requirements because of the complexity of local conditions that must be considered when setting regulatory buffers. However, in a couple of key instances King County's BAS and regulatory buffers were cited as appropriate examples that local jurisdictions could follow. As part of the Snohomish Basin Salmon Recovery Plan, the Snoqualmie Watershed Forum developed a model critical areas code, largely emulating King County's, for the cities of Duvall, Carnation, Snoqualmie and North Bend. In addition, the Lake Washington Salmon Recovery Plan cites the Tri-County Salmon Recovery Plan along with King County's BAS and CAO as examples of acceptable BAS and environmental regulatory standards (see Appendix D-6 http://www.govlink.org/watersheds/8/planning/chinook-plan/volumeIII/05_Appendix_D_Actions.pdf).

Basis and effectiveness of King County's buffers

King County's aquatic area protection focuses on protecting ecological processes that sustain and create habitats and species (King County 2004). The site potential tree height (SPTH) concept (FEMAT 1993) was used as a scalar for assessing environmental benefits and, ultimately, for setting regulatory buffer widths along its larger aquatic habitats, including shorelines of the state and all salmonid bearing streams. The SPTH concept has been used extensively in other environmental protection efforts, most notably the landmark Forest and Fish agreement between Washington State Department of Natural Resources and NOAA and U.S. Fish and Wildlife Service (TFW Caucuses 1999, Washington Forest Practices Board 2000, CH2MHill 2000).

From King County 2004: "The concept of scaling riparian buffer widths to the potential height of a tree was first proposed by the Federal Ecosystem Management Team who was assessing riparian protections for national forest lands (FEMAT 1993). They reasoned that trees were a logical scaling factor because (1) they are a dominant factor in determining habitat conditions and (2) when left unmanaged, their size (height) reflected inherent productivity and constraints of a given site. As a result of this logic generalized curves using scientific data and professional judgment were developed to help rate buffer effectiveness for a variety of ecological functions, including shade, litter fall (e.g., leaves, branches), root strength, and coarse woody debris inputs. Curves for a set of factors (soil moisture, radiation, soils temperature, air temperature, wind speed, and relative humidity) relating to microclimate were also developed. These curves are shown in Figure A-1. Based on these curves, all but microclimate functions would likely be protected with a buffer width equivalent to one SPTH. Microclimate functions would need approximately three SPTH for full protection."

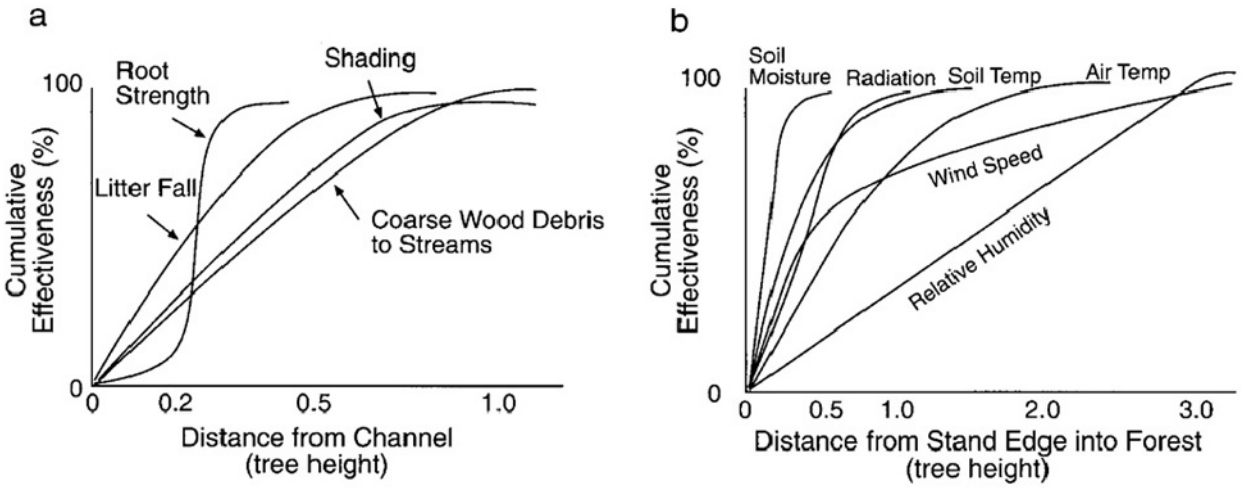

Figure A-1. Riparian vegetation effectiveness as a function of the height of a site potential tree distance from the water's edge. *Graph (a) shows cumulative effectiveness of four riparian processes as a function of relative distance from the edge of a stream, in fractions of a dominant tree height. Graph (b) shows cumulative effectiveness for six microclimate factors as a function of relative distance from the stream edge. Modified from FEMAT (1993) and Naiman et al. (2000).*

Brennan et al. (2009) recently convened a team of scientist to assess the applicability of FEMAT-style curves to marine riparian. Although developed for freshwater riparian areas, they concluded such curves were appropriate for the marine context as well.

Liquori et al. (2008) conducted an extensive review of literature for assessing effects of and management recommendation for California forestry practices. They highlight that simple (fixed-width) application of source-distance curves does not account for geomorphic variability and the disturbance-driven spatial variation in functions and the need to account for process-based goals. King County's buffers encompass features and land area critical for ecological processes and widen to include floodplains, wetlands and steep slopes where those features exceed the 165-foot buffer.

Effectiveness of King County's Buffers

To assess potential effectiveness of King County's buffers we used estimates of SPTH by forest site class provided by CH2MHill (2000). Estimates are for 100-year-old trees, which are appropriate for 100-year floodplains where tree are unlikely to live out their maximal life span. Heights vary from 200 feet for the most productive (Class I) site to 90 feet for the least productive (Class V) sites. King County's floodplains appear to be an approximately equal mix of Class II and III sites, with SPTHs of 170 and 140 feet, respectively, based on visual inspection of site class maps provided by WDNR (http://www.dnr.wa.gov/BusinessPermits/Topics/ForestPracticesApplications/Pages/fp_gis_spatial_data.aspx). No Class I sites were observed in the maps and King County Foresters are unaware of any Class I in King County's floodplains. There are however, a number of floodplain sites that would produce smaller trees, thus a simple average of Class II and III SPTHs may be an overestimate of the average SPTH. For the purpose of this report, we assume an equal mix of Class II and Class III forest class sites resulting in an average SPTH for King County's floodplains of 155 feet (170+140/2).

Table A-1 provides a comparison of the NOAA BiOp and King County buffers by stream type expressed in feet and SPTH equivalents. For Type S and F rural streams and streams in urban areas with a high basin condition (Lucchetti and Moe 2004), King County's buffers are roughly equivalent to or greater than a SPTH whereas NOAA's buffers would be 1.6Xs SPTH. As previously noted, a single SPTH would provide all but micro-climate control which would need three SPTHs. Neither King County nor NOAA's buffers would meet the micro-climate standard but both would provide the other basic riparian functions noted in FEMAT 1993 and Naiman et al. (2000). It is important to note that King County applies a "presumption of salmonids standard" in its stream typing. Thus, streams that historically may not have been considered a salmonid stream due to their small size, lack of observed salmonid use or being upstream of an artificial barrier, receive the highest protection standard. Also as a result, Type N streams with no potential for salmonid use comprise a smaller subset of small streams than would have been typed previously, i.e., some historic Type Ns are now Type F streams. Type O streams are a very limited set of streams that have no surface connection to a salmonid-bearing stream.

Table A-1. Comparison of King County and NOAA riparian buffer requirements expressed in feet and site potential tree height (SPTH) equivalents from NOAA-approved Forest and Fish agreements. SPTH = 155 ft, based on an equal mix of Class II and Class III forest class sites (CH2MHill 2000).

		King County CAO (2005)		NOAA Biop (2008)	
Water type	**Context**	**Width**	**SPTH**	**Width**	**SPTH**
S and F	Rural	165	1.06	250	1.61
	Urban	115	0.74	250	1.61
	Urban – "High" basin condition	165	1.06	250	1.61
N	Rural/urban	65	0.42	100	0.65
	Bear Creek	100	0.65	100	0.65
U (NOAA only)	Rural/urban	N/A	–	50	0.32
O (KC only)	Rural/urban	25	0.16	N/A	–

Urban Areas

Urbanization may irreversibly alter landscapes and associated ecological processes (Booth and Reinelt 1993, Booth 2002). Placing a higher priority on protecting areas with high habitat restoration or species recovery potential is consistent with recommendations for protection of aquatic resources in developing areas (Booth et al. 2002; Roni et al. 2002) and for salmonid recovery (Spence 1996).

In King County, rural buffers are required for urban streams where their watershed environmental context is considered high. Otherwise, smaller buffers (albeit still large by historic standards) for urban areas are warranted because these areas are constrained by high density buildings and infrastructure resulting in limited or no opportunity for significant amounts of riparian forest to establish and because large buffers would create property rights conflicts.

Regardless, King County regulates only a small amount of urban floodplain (Table A-2). Of almost 32,000 floodplain acres, urban zoning accounts for 2,100 acres (6.8 percent). Of this, the majority is in potential annexation areas (PAA) for the Cities of North Bend and Snoqualmie, both of which are upstream of Snoqualmie Falls which is a natural barrier to anadromous fishes and an area with no known ESA-listed species. A smaller amount is downstream of Snoqualmie Falls in the PAA for the City of Carnation. Additional small slivers of King County urban are located in the lower Duwamish (near Boeing Field) and in the middle Green River between Kent and Auburn.

Table A-2. Zoning in King County 100-year Floodplains (includes areas upstream of falls and open water)

Zoning Designations	Density Allowed	Acres in Floodplain	% of total King County floodplain
RURAL AREA			
RA-2.5 - Rural Area	5 acres per lot (NOT 2.5)	1378.68	4.31%
RA-5 – Rural Area	5 acres per lot or 10 acres per lot if located in SDO	4061.01	12.71%
RA-10 – Rural Area	10 acres per lot	4851.04	15.18%
	Total	**10,290.73**	**32.2%**
RESOURCES LANDS			
A-10 or A-35 - Agricultural	10 acres per lot or 35 acres per lot	17319.66	54.19%
F - Forest	80 acres per lot	2015.06	6.31%
M - Mining	residential not allowed	26.96	0.08%
	Total	**19,361.68**	**60.58%**
URBAN AREA			
UR – Urban Reserve	5 acres per lot	915.86	2.87%
R-1 Residential	1 acre per dwelling unit	482.63	1.51%
R-4 Residential	4 dwelling unit per acre	369.36	1.16%
R-6 Residential	6 dwelling units per acre	69.15	0.22%
R-8 Residential	8 dwelling units per acre	1.16	0.00%
R-12 Residential	12 dwelling units per acre	0.21	0.00%
NB – Neighborhood Business	8 dwelling units per acre (incentives or TDR)	4.80	0.02%
CB – Community Business	18 dwelling units per acre (incentives or TDR)	6.52	0.02%
RB – Regional Business	36 dwelling units per acre (incentives or TDR)	0.01	0.00%
O - Office	36 dwelling units per acre (incentives or TDR)	0.34	0.00%
I - Industrial	residential not allowed	288.84	0.90%
	Total	**2,138.88**	**6.68%**
No designation	general non-buildable	167.64	0.52%
Total		**31,958.93**	**100.00%**

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