

Chapter 5: INSTITUTIONAL CONTEXT

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Chapter 5: INSTITUTIONAL CONTEXT

5.1 INTRODUCTION

In order to evaluate the proposed standards effectiveness, the standards must be understood in the context of the institution that implements them. For example, high standards may be ineffective if a jurisdiction applies them blindly or doesn't enforce them. Similarly low standards may be more effective than they appear if implemented in the context of other management actions, such as capital and programmatic actions, that protect or restore habitat and if the agency has a history of proper planning, informed management, and adequate enforcement.

King County is a large municipal government with major responsibility for managing highly diverse and often fractious land use and natural resource issues. By the mid-1980s, serious erosion and flooding problems caused by improperly controlled land use were becoming apparent (see Booth 1989). In response, the County conducted a Basin Reconnaissance program followed by a more in-depth and more-sophisticated Basin Planning program. These programs focused on identifying and understanding the cause of problems and then identifying and prioritizing solutions in King County's Surface Water Utility Fee Service Area (mainly urbanizing areas). Solutions focused on prevention or reducing impacts of development on people, property, and infrastructure as well as protection and restoration of water quality and key aquatic resources.

5.2 OVERVIEW OF PROGRAMS THAT SUPPORT CRITICAL AREA PROTECTION

Protection for critical areas provided by the proposed Critical Area Ordinance (CAO) is augmented and supported by many other programs for resource protection. The risk analysis discussions in Chapter 2 – Assessment of CAO Fixed Regulations, Sections 2.7 to 2.9 for Aquatic Areas, Wildlife Areas, and Wetlands, respectively, considered how these programs augmented resource protection when assessing the overall risk to critical areas when the standard departs or is the lower range of BAS recommendations. It should be noted that the programs below include both ones based on scientific criteria, such as in WAC 365-195-900 to 925, and ones that provide general educational information to protect the resources. The following text is a sampling of the more advantageous King County programs for critical area and resource protection. For additional programs see the Department of Natural Resources and Parks website: <http://dnr.metrokc.gov/index.htm>.

Habitat Restoration:

- The Small Habitat Restoration Program, begun in 1994, builds projects that focus on habitat or ecological restoration located along natural streams and tributaries. The program completed 146 projects by 2000 with the help of hundreds of volunteers and citizen groups. See also <http://dnr.metrokc.gov/wtd/shrp/index.htm>.
- The Drainage and Habitat Improvement Program began in 1993 and builds small capital projects that help resolve minor damage, erosion, and sedimentation problems, as well as

improve wetlands, water quality, and habitat in or along natural stream systems. By 2000, 35 projects have been completed worth over \$2 million.

Public Education and Involvement, Community Habitat Restoration and Stewardship:

- A variety of programs for education and involvement are available through the Department of Natural Resources and Parks website: <http://dnr.metrokc.gov/index.htm>.
- Wetland and Amphibian Breeding Program recruited volunteers to assess the health of over 80 wetlands and the amphibians that inhabit them. More information is located at <http://dnr.metrokc.gov/wlr/waterres/amphibian/index.htm>.
- Seven basin stewards help protect and restore habitat lands by working with landowners, community members, and technical experts. The basin steward program is instrumental in securing state and federal funds for habitat acquisition and restoration projects.
- The Forestry Stewardship Program provides education, technical assistance, and economic incentives to help keep lands covered by forests. Information is located at: <http://dnr.metrokc.gov/wlr/lands/forestry/Forestry-Plan.htm>.
- The Lakes Stewardship Program empowers and encourages citizens to take responsibility for protecting neighboring lakes and watersheds. Information is located at: <http://dnr.metrokc.gov/wlr/waterres/smlakes/index.htm>.
- Natural Lands Volunteer Program responds to ecological and natural resource needs in rural areas. This program includes volunteers planting riparian native trees and shrubs, conifer tree seedlings, weeding (such as the Noxious Weed Program's work toward eradicating invasive species), and trail maintenance.

Maintenance of King County Facilities:

- In January 2002, twenty-five Washington State jurisdictions (included WSDOT) formally submitted a joint routine road maintenance program to the National Marine Fisheries Service (NOAA Fisheries) for approval under Limit 10 of the Endangered Species Act (ESA) section 4(d) rule. The Regional Road Maintenance ESA Program Guidelines (Regional Program) describes physical, structural, and managerial best management practices designed so that when they are used, singularly or in combination, they reduce road maintenance activities' impacts on water and habitat. Further information is available at the Internet website: <http://www.metrokc.gov/roadcon/bmp/pdfguide.htm>.
- The Water and Land Resources Division's Neighborhood Drainage Assistance Program (NDAP) addresses flooding, erosion and sedimentation problems affecting private property in unincorporated King County. The NDAP can design and fund capital improvement projects and maintain or repair existing drainage systems. Further information is available at the Internet website: <http://dnr.metrokc.gov/wlr/stormwater.gov>. WLRD Stormwater Services Section also has a commercial inspection program. See above Internet address.

Open Space/Habitat Lands Acquisition Program/ Incentives Programs:

- Natural lands acquired since 1970 are 26,542 acres total (7,660 riparian and 18,882 watershed).
- The Comprehensive Plan goal of conserving open space in rural areas is being achieved through a variety of programs such as the Transfer of Development Rights Program (TDR), in which rural open space is exchanged for higher urban densities. Clustering of housing and

a change in height restrictions in urban areas have also likely contributed to a decrease in development in the rural areas.

- Current Use Taxation Programs or the Public Benefit Rating System (PBRS) provide a tax incentive for resource and natural lands to remain in their current use, such as forestry, timberlands, agriculture, or open space. For example the Farmland Preservation Program (at: <http://dnr.metrokc.gov/wlr/lands/farmpp.htm>) has acquired the development rights of 12,800 acres of high-quality farmland and enrolled these in PBRS.

Monitoring Efforts:

- The Benchmark System for Countywide Planning Policies provides annual reports for King County's Office of Budget. The section on "Environment" gives stream monitoring information for water quality and water quantity, as well as other environmental factors such as salmon stocks and groundwater reports. This information can be found at the Office of Budget's website: http://www.metrokc.gov/budget/agr/agr02/ch2_02.pdf.
- Endangered Species Act and National Pollutant Discharge Elimination System Permit Monitoring is done to ensure that the county is in compliance with federal and state laws. Physical (flow/hydrology modeling), chemical (water chemistry), biological (fish and wildlife), landscape, and land-use data are collected, analyzed, and evaluated for use in watershed management plans and salmon recovery efforts. Data are used to assess the status and current condition of watersheds, to evaluate the effectiveness of watershed plans and projects and to help identify areas in need of additional protection or restoration. This information can be found on the Internet at: <http://www.metrokc.gov/exec/esa/progressreport.htm>.
- The Hydrologic Monitoring Program operates over 120 monitoring stations in King County to collect streamflow, water temperature, rainfall, water quality, and other hydrologic data. The data are used in the design of capital projects for treating stormwater and wastewater. The data can be found on the Internet at: <http://dnr.metrokc.gov/hydrodat/index.htm>.
- Many of the volunteer and stewardship programs have monitoring programs, such as the Large Lakes Volunteer Monitoring Program. Information on this program can be found at: [Http://dnr.metrokc.gov/wlr/waterres/smlakes/index.htm](http://dnr.metrokc.gov/wlr/waterres/smlakes/index.htm).

WRIA Planning Efforts:

Planning by watershed or Water Resource Inventory Area (WRIA) includes both Near Term Action Agendas and long term Conservation Plans with a variety of projects for resource protection and restoration. WRIA planning is increasingly understood to be an effective way to account for the specific needs of the different fish populations and habitats found in different parts of the county. Further information can be found at the Internet website: <http://dnr.metrokc.gov/wrias/index.htm>.

Tri-County Conservation Coalition:

This organization formed in response to the proposed listing of chinook salmon and bull trout under the Endangered Species Act. The Tri-County Model 4(d) Rule Response Proposal: A Salmon Conservation Program and information in Biological Review: Tri-County Model 4(d) Rule Response Proposal are being used by King County in developing programs and updating regulation. For further information see: <http://www.salmoninfo.org>.

Capital Improvement Projects:

The Capital Improvements Section of the Water and Land Resources Division of the Department of Natural Resources and Parks performs the following tasks: Engineering and ecological/biological design, securing permits, and managing construction of surface water-related drainage and habitat projects identified by the four core businesses of the division: (1) Flood Hazard Reduction, (2) Land and Water Stewardship, (3) Stormwater Services, and (4) Rural and Resource Lands programs. In addition, numerous other capital projects that benefit critical areas and natural resources are undertaken by King County.

5.3 HIGHLIGHTS OF PROGRAMS BY CRITICAL AREA

5.3.1 King County Flood Hazard Reduction Projects and Programs

The proposed Critical Areas, Stormwater, and Clearing and Grading Ordinance standards, discussed in Chapter 2 – Assessment of CAO Fixed Regulations, and Chapter 3 – Incentives and CAO Planning Programs, are part of the County’s overall efforts to address flood hazard issues. King County conducts a number of projects every year that are aimed at protecting the public, public resources, and facilities from injury, loss of life, property damage or financial loss due to flooding. These projects also help King County maintain its high Community Rating System (CRS) rating under the National Flood Insurance Program (NFIP). Unfortunately, these projects are subject to available funding, and the number of projects that can be completed each year varies. King County has been very successful in the last decade in acquiring federal and state public assistance and mitigation funds to repair and retrofit damages to County flood protection facilities and for land acquisition and home elevation projects. These funds have significantly broadened King County’s ability to provide floodplain management services.

In recent years, King County’s river maintenance and construction projects have incorporated significant aquatic and riparian habitat enhancement features into the design of their facilities. In addition, the home buyout and land acquisition projects provide the potential to restore the floodplain back to its natural state where it can function once again as a productive, viable ecosystem. Project prioritization is based on a variety of factors including, but not limited to, willing sellers, available funding, opportunities to meet other county goals, such as trail or open space acquisition and potential risk to the property.

In addition, King County administers or participates in a number of programs through implementation of the Flood Hazard Reduction Plan (FHRP) and participation in the NFIP. King County will be using the best available science to update the FHRP to be consistent with the Washington State Growth Management Act (GMA) and the federal Endangered Species Act (ESA). In updating the FHRP, a floodplain corridor concept is being developed that would include a habitat floodway that addresses the integration of floodplain management and the protection of aquatic habitats and species. The habitat floodway would also address human encroachments, such as trails, recreational access, interpretative and educational features, that are typical of multiple-objective management plans.

Table 5.1 King County Flood Protection Projects

| Project | Description |
|---|---|
| Capital Improvement Projects | King County designs and constructs surface water capital improvements with additional emphasis on habitat restoration of wetlands and streams as well as traditional stormwater conveyance systems and regional retention/ detention facilities. In 2002, twenty-three large capital projects and twenty-two small capital project were constructed with a budget of \$2.9 million and \$440 thousand respectively. |
| Maintenance, repair and replacement of facilities | King County conducts a wide variety of maintenance, repair, and replacement projects each year. Since 1990, King County's Flood Hazard Reduction Services (FHRS) Section completed 178 levee and revetment projects for a cost of \$16.3 million. |
| Home elevations | King County assists property owners in elevating their structures above the base flood elevation. See below under Home Elevation Program for more details. King County FHRS Section assisted in elevating ten residential structures; four of these were elevated in 2002. |
| Home Buyouts | Private property owners may voluntarily sell their property to King County if it is located in a flood-prone area and there is funding available. See below under Home Buyout Program for more details. From 1990 through 2001, King County acquired 30 residences. Four additional properties were acquired in 2002 and FHRS Section is currently working on the purchase of three additional residential structures. |
| Floodplain and Channel Migration Zone Mapping | Since 1993, over 45 river miles of floodplain mapping have been completed and submitted to FEMA to update the FIRMs. King County has just recently completed an additional 20 miles of the Cedar River. In addition, floodplain analyses for numerous stream systems have also been completed since 1990. Delineation of channel migration zones in King County began in 1990 and to date, nearly 49 river miles have been mapped. |
| Guidelines for Bank Stabilization Projects | King County has developed guidelines to assist scientists and engineers with the design of bank stabilization projects that will enhance the fish and wildlife habitat, reduce local stream velocities and increase the structural integrity of projects. These types of projects provide the opportunity to implement habitat enhancement elements in association with major river corridor projects, such as levee removals, that are integral to contemporary floodplain management. |

Table 5.2 Federal, State and King County Flood Protection Programs

| Program | Description |
|----------------------------------|--|
| National Flood Insurance Program | King County participates in the National Flood Insurance Program, which allows property owners to purchase flood insurance. Because of King County's high rating based on regulations, projects and programs, property owners currently enjoy a 30-percent discount on annual flood insurance premiums. |
| Cost of Compliance | Cost of compliance flood insurance coverage, which is available under the National Flood Insurance Program, allows payment of up to an additional \$20,000 to cover compliance with local ordinances affecting repair or reconstruction involving elevation, floodproofing, relocation, or demolition of a structure, after a direct loss caused by a flood. |

| Program | Description |
|-----------------------------------|--|
| Monitoring | King County manages a system of levees and revetments totaling about 65 miles of river frontage on four major river systems. Facilities that protect major infrastructure and population centers are systematically monitored and evaluated through several types of monitoring; on flood emergency basis during storm events, through routine monitoring and maintenance inspections during the dry season, and through site-specific monitoring at facility repair and retrofit sites. In addition, channel cross-sections are measured on both a routine and on a flood-event basis to provide information on sediment accumulation that may impact the effectiveness of flood protection facilities. |
| Home Elevation | King County's home elevation program helps property owners to elevate their homes above the base flood elevation through a FEMA Flood Mitigation Assistance grant administered by Washington State Emergency Management Division. When property owners participate in the home elevation program, they must record a covenant on their title that the space below the foundation cannot be used in a manner that would impede the movement of water beneath the structure. In addition, the covenant must include an agreement that the homeowner will not file an insurance claim for contents stored under the structure that may be damaged by floodwaters. |
| Home Buyout | King County's home buyout program involves the voluntary sale of flood-prone properties and structures to King County at fair market value. The funds are provided by federal and state grants through a competitive process. King County has received a grant from the Hazard Mitigation Grant Program administered by FEMA. Once the sale has taken place, the home is removed from the floodplain and the property is permanently restricted from future development. |
| Land Acquisition | King County has continued a significant program of land and floodplain acquisitions designed to reduce flood losses and improve natural resource and environmental conditions in the major watersheds of King County. King County FHRS has acquired over 350 acres of watershed property at a cost of nearly \$4.1 million since 1996. |
| Flood Control Zone Districts | The Green River Flood Control Zone District was formed in 1960 in cooperation with King County and the affected lower Green River Valley cities. The district was activated in December 1990. The purpose of the district is to provide a funding base for operating and maintaining levees, revetments and pump stations on the Green River within the district's boundaries, and to fund the Green River Basin Program. |
| Elevation certificates | King County maintains elevation certificates for new and substantially improved buildings located in a flood hazard area. This information is available for public review and provides additional information on flood hazard areas. |
| Flood Warning Center | King County operates a flood warning program to gather, analyze and distribute flood warning information so that residents, businesses, property owners and emergency response officials can make critical health and safety decisions before, during and after flood events. |
| Flood Hazard Information Services | King County provides Flood Insurance Rate Map (FIRM) information to the public on request. The maps are maintained and updated with the best available information. In addition, King County provides technical information, such as control surveys, cross-section data, and hydraulic model information. |

| Program | Description |
|--|--|
| Brochures | King County has a Flood Warning Information brochure that describes how to use King County's flood warning services, important phone numbers, a floodplain map, river monitoring gage locations, what to do before, during and after a flood and a list of frequently flooded roads. This brochure is sent to all repetitive loss properties, local libraries and interested persons. In addition, the Department of Development and Environmental Services has a Customer Information Bulletin providing information about Flood Insurance and FEMA regulations and services. |
| Mailings to Realtors, Lenders and Insurance Agents | King County has a program to annually provide information to a list of realtors, lenders, and insurance agents on the requirements for flood insurance and regulations relating to development within a flood hazard area. |
| Internet Website | King County has a website that can be accessed by anyone with Internet capabilities. This website provides information about King County's Flood Hazard Reduction Services and provides a link to the river monitoring gage information so the public can monitor river conditions directly from their computer during a flood event. |
| Project Impact Television Program | King County has produced a television program that educates citizens on how to prepare for flooding and informs them of King County's role in flood warning and floodplain management. This program was produced with the King County Office of Emergency Management and is shown on AT&T cable, which reaches approximately 900,000 households. The program was also distributed to cities that operate municipal television stations. |
| Annual Agency Meetings | King County holds annual meetings in each major river watershed to update the Flood Warning Center priority call lists and discuss flood warning and emergency response procedures. |
| Public Libraries | King County provides documents, brochures, and other information to all public libraries for use by the public. |
| Enforcement of Codes | King County works with property owners to bring about compliance with King County flood hazard regulations. Enforcement is both through review of permits for compliance with the code as well as identified code violations. |
| Stormwater Management | King County provides storm and surface water services and water quality management services in both the urban and rural areas of King County. Those services include maintenance of residential stormwater facilities, inspection and maintenance of commercial stormwater facilities, inspection, and enforcement to ensure compliance with King County's water quality code, and complaint investigation services related to drainage, flooding, and erosion problems. |
| Repetitive Loss | Properties that file repetitive losses with FEMA are tracked. King County contacts the repetitive loss property owners yearly with information on assistance that is available to them and how to make their property more flood resistant. |
| Flood Awareness Month | The King County Executive annually declares October as "Flood Awareness Month." A news release, copy of the executive's proclamation and a flood preparedness brochure are sent to a comprehensive list of print and broadcast media. |

5.3.2 Other King County Management Actions that Contribute to Channel Migration Zone Protection

King County has constructed a number of projects to remove, set back, or abandon existing levees and revetments along major rivers. More of such projects will occur with continued implementation in the King County Flood Hazard Reduction Plan (King County 1993) and

various basin plans and Water Resource Inventory Areas (WRIA) plans. Removal or setback of these facilities allows greater channel migration to occur, increases floodplain connectivity, and allows reestablishment of riparian vegetation.

The County has acquired and will continue to acquire property within riparian areas and flood hazard areas. Removal of structures on acquired properties reduces flood hazard and allows channel migration. Restoration measures such as revegetation typically accompany property acquisition.

County staff members provide public information presentations periodically on channel migration at various workshops, council meetings, etc. Similarly, County information and assistance on channel migration issues is made available to neighboring jurisdictions. King County web sites describe channel migration and channel migration zone (CMZ) regulations. As further public information, people can plot the extent of mapped CMZ boundaries on parcel-based maps from a King County DDES web site. Also, the technical study that is the basis of each completed King County CMZ map is available for purchase.

5.3.3 Geologic Hazards

The proposed critical areas, stormwater and clearing and grading ordinances contain provisions that establish Geologic Hazard Areas. The hazard areas are identified for purposes of protection of public safety and welfare, and to a lesser degree for protection of water quality. Protection is achieved by implementation of development restrictions and development standards. In certain critical cases, development is severely curtailed because of the danger posed by these areas.

As described in the BAS, Volume I, certain features like landslides and volcanoes can be extremely hazardous to human health and safety, critical lifelines, and public and private property. The only effective way to safeguard the public health and safety is to regulate these areas. The areas must be identified by established and scientifically sound methods and their evaluation and identification must be carried out by professionals trained in the geosciences. King County employs geologists and engineers that are competent to identify and evaluate these areas. Regulations have been developed by these professionals over a period of about 20 years that to-date have served to protect the public, even during events like the 2001 Nisqually earthquake.

5.3.4 Critical Aquifer Recharge Areas (CARA)

The protection of groundwater, whether inside or outside the designated CARA, relies to a great extent on other existing state and federal regulations that work to prevent contamination from different land-use activities (see Table 5.3). There are also a number of additional groundwater protection measures/programs that help protect groundwater from contamination:

- The National Environmental Policy Act (NEPA) requires all actions sponsored, funded, permitted or approved by federal agencies undergo planning to ensure that environmental considerations, such as the impact to groundwater, are given due weight in project decision making.

- The State Environmental Policy Act (SEPA) requires similar consideration for state and local actions. Many groundwater-monitoring programs are also developed as a result of the SEPA process.
- The Underground Injection Control (UIC) Program is designed to prevent contamination of underground sources of drinking water from the use of injection wells. This program requires that all new injection wells treat the “waste” before injection into the subsurface.
- RCW 90.48 is the primary Washington State water pollution law. Under this statute, all discharges of pollutants to groundwater are prohibited unless authorized.
- WAC 173-200 mandates groundwater quality standards to maintain the highest quality of the state’s groundwater through the reduction or elimination of contaminant discharges. This requirement is administered through the State Waste Discharge (SWD) Permit and the National Pollutant Discharge Elimination System (NPDES).
- King County Code, Section 9.12, deals with water quality for both surface and groundwaters, and prohibits discharge of various contaminants.
- Wellhead protection is mandated by the federal Safe Drinking Water Act and the WA State Department of Health (WA DOH) is the lead agency for implementing the WHPA program within Washington. The WA DOH currently requires all Group A (large system) wells and new Group B (small system) wells to delineate WHPAs. The Group A public water supply wells must also conduct an inventory of potential contaminant sources within their WHPA.
- Well sources for smaller water supply systems are protected by siting, design, and construction requirements contained in King County Board of Health (KC BoH) Rules, Title 12.
- Sole Source Aquifer (SSA) designations recognize aquifers that provide more than 50 percent of the drinking water in the area.
- Groundwater quantity (and quality associated with stormwater discharge) is also protected by King County Code Title 9 and the Surface Water Design Manual, both of which are being revised in association with this Critical Areas Ordinance.

An important non-regulatory tool that supplements the current and proposed rules, regulations, guidance measures, and programs is education and outreach. This can be crucial in protecting groundwater from residential sources of contamination. Private individual wells, for instance, are not typically regulated for the safety or quality of drinking water; education programs can assist in informing these well owners of potential problems. Such outreach is provided by King County Department of Natural Resources & Parks, Public Health, Ecology, EPA, Washington State University Cooperative Extension, Purveyors, Cities, and some non-governmental organizations.

Finally, inspection and compliance programs are a key component to protection of groundwater. The rules and regulations cannot be effective without a mechanism for enforcement. The development of best management practices, without implementation, is not effective groundwater protection.

Table 5.3 Current Statutes/Regulations/Guidance Documents for the Protection of Water Quality in Washington State

| Activity | Statute – Regulation – Guidance |
|--|---|
| Above ground Storage Tanks | Chapter 173-180A WAC, Chapter 173-303-145 WAC, Chapter 173-303-640 WAC |
| Animal Feedlots and livestock management | Chapter 173-216-WAC, Chapter 173-220 WAC, K.C.C. 21A.30 |
| Automobile Washers | Chapter 173-216-WAC, Best Management Practices for Vehicle and Equipment Discharge (WDOE WQ-R-95-56) |
| Underground Storage Tanks | Chapter 173-360-WAC |
| Chemical Treatment Storage and Disposal Facilities | Chapter 173-303-182 WAC |
| Hazardous Waste Generators (Boat Repair Shops, Biological Research Facility, Dry Cleaners, Furniture Stripping, Motor Vehicle Service Garages, Photographic Processing, Printing and Publishing Shops, etc.) | Chapter 173-303 WAC |
| Underground Injection Wells | Federal 40 CFR Parts 144 and 146, Chapter 173-218 WAC |
| Junk Yards and Salvage Yards (Wrecking Yards) | Chapter 173-304-WAC, Best Management Practices to Prevent Storm water Pollution at Vehicles Recycler Facilities (WDOE 94-146) |
| Hydrocarbon Extraction | Chapter 332-12-450 WAC, Chapter 173-218 WAC |
| On-Site Sewage Systems (Large Scale) | Chapter 173-240 WAC |
| On-Site Sewage Systems (<14,500 gal/day) | Chapter 246-272 WAC, KC BoH Title 13 |
| Pesticide Storage and Use | Chapter 15.54 RCW, Chapter 17.21 RCW |
| Agricultural Uses of Fertilizer | Chapter 15.54 RCW, WAC 16-200-695 to 742 |
| Sawmills | Chapter 173-303 WAC, 173-304 WAC Best Management Practices to Prevent Storm water Pollution at Log Yards (WDOE 95-53) |
| Solid Waste Handling and Recycling Facilities | Chapter 173-304 WAC, K.C.C. Title 10 |
| Surface Mines | Chapter 332-18-015 WAC, K.C.C. 21A.22 |
| Waste Water Applications to Land Surface | Chapter 173-216 WAC, Chapter 173-200 WAC, WDOE Land Application Guidelines, Best Management Practices for Irrigated Agriculture |

5.3.5 Aquatic Areas

For aquatic habitats and species, the former Basin Planning program's key strategy was protection and restoration of biologically productive, unique, or rare resources. Key to this was the identification and protection of "the best" habitats using the Regionally and Locally Significant Resource Areas (RSRA and LSRA) concept. While a primary emphasis of this planning was salmonid based, other aquatic resources were also a priority, resulting, for example, in designation of habitats such as bogs, fens, and other non-salmonid habitats as significant

resource areas. Today, much of King County's habitat-based programs, regulations, capital projects, and even the Urban Growth Area (UGA) boundaries reflect information that was developed under the Reconnaissance and Basin Planning programs. Monitoring programs were developed and implemented to assess the effectiveness of the Basin Planning programs and make course changes as needed.

In 1998 proposed listing of two salmonids, Puget Sound chinook and coastal bull trout under the federal Endangered Species Act shifted attention even more toward salmon-based conservation, although significant work continues to be done for other species and habitats (see for example studies by Fevold and Vanderhoof (2002) on mussels and William's et al. 2001 on the near-shore environment). In response to the ESA listings, King County conducted an unprecedented, comprehensive biological review of the consistency of its regulatory, maintenance, and capital programs with salmon conservation (see "Return of the Kings", King County 1999). Following this, King County joined with Snohomish and Pierce counties and major cities including Seattle, Bellevue, Everett and Tacoma, to develop a model proposal for saving salmon in the Tri-County area (Tri-County 2001). The regulatory elements of the Tri-County model proposal, as well as the early action and watershed salmon conservation planning programs it instigated, are the basis for most of the aquatic area protections in the proposed CAO and Stormwater ordinances. A biological review of the scientific basis for and efficacy of the Tri-County program was recently conducted (Parametrix 2002). The review concluded that the model proposal is primarily based on BAS and is likely to conserve most habitat and habitat functions supporting salmonid species consistent with federal guidelines. The Tri-County proposal was focused on salmonid conservation; however, and as a result did not explicitly address the needs of all fish and wildlife or of GMA designated critical areas and functions.

As a result of this attention on salmonids, major multi-jurisdiction and interdisciplinary planning efforts have been implemented and early actions to protect and restore the aquatic habitats and change programs have occurred at almost all levels of County government. King County has developed a strategic and comprehensive approach to aquatic resource conservation, still heavily focused on salmonids but also with considerable attention toward protecting or restoring ecological processes which benefits a variety of plants and animals. Just since 2000, the County has spent approximately \$17.3 million to acquire 2,300 acres (931 ha) in riparian areas, forested watershed areas, and floodplains. Furthermore, the County's Comprehensive Plan and environmental regulations have been modified several times in response to increased knowledge about the problems and needs related to aquatic resources. Major changes to minimize the impacts of roads and wastewater maintenance on aquatic areas have also been implemented. Additionally, the County funds substantial public education and involvement programs for aquatic resource protection.

5.3.6 Wildlife Areas

King County contributes to preservation of biodiversity by protecting specific habitats and species of concern on a site-specific basis. Ideally, wildlife protection regulations consider land use effects on wildlife across the landscape in addition to addressing the effects at the site-specific scale. A landscape perspective is critical for understanding the impacts of development on ecological processes and the functions and values of wildlife species and habitats. A landscape approach to conservation is necessary to effectively maintain biodiversity and oversee no net loss of species or critical areas (see BAS, Volume I report, Chapter 2 – Scientific Framework).

King County proposes a framework for protecting various wildlife species that includes the designation of select breeding habitats as critical areas, consideration of wildlife management guidelines in site planning, protection of a designated Wildlife Habitat Network, and preservation of priority habitats through incentives. The 35 percent clearing restriction (proposed Clearing and Grading Ordinance, K.C.C. 16.82) and the wetland and aquatic areas protection requirements (see BAS, Volume I report, Chapter 7 – Aquatic Areas and Chapter 9 – Wetlands) will also provide varying levels of protection to wildlife species including foraging habitat and dispersal routes.

The County's Ecological Lands holdings and their management are intended to contribute to the County's biodiversity. Management of these lands is intended to be based in a landscape perspective and is in synch with the conservation principles explained in the Best Available Science, Volume I report, Chapter 2, the Scientific Framework. Although these lands do not comprise a large portion of the County's natural resources, they do comprise some of the most ecologically valuable, and as such may provide critical links in habitat connectivity along with the Wildlife Habitat Network and other protected lands.

5.3.7 Wetlands

The most notable programs contributing to wetland protection are those that implement King County Basin Plans and those that control invasive species. In the Bear Creek Plan (King County Surface Water Management Division et al. 1990) regionally Significant Resource Areas (RSRAs) were identified with an emphasis on protecting watershed functions, including aquatic functions of both streams and wetlands, and important salmonid functions. In the East Lake Sammamish Basin Plan (King County Surface Water Management Division 1994), the County established Wetland Management Areas (WMAs) to protect important wetland systems on the Sammamish plateau. More recently adopted basin plans, such as the Cedar River Basin Plan, also attempt to take a more comprehensive method of protecting wetland (and stream) hydrological function, by restricting clearing (i.e., vegetation removal) to no less than 35 percent where subdivisions are permitted. Bear Creek and Issaquah Creek Basin Plans reflect this policy as well (King County Surface Water Management Division et al. 1996).

The King County Noxious Weed Control Program (KCNWCP) administers the Washington State Weed Law RCW 17.10, and works throughout the County to reduce the economic, environmental and social impacts of noxious weeds. KCNWCP began a comprehensive wetland & aquatic resource assessment strategy in 1997, and added a full-time aquatic weed specialist in 2002 to coordinate these efforts. The program provides education and outreach to landowners and land managers on the identification of noxious weeds and the development of appropriate Integrated Pest Management (IPM) control strategies. Staff conducts inventory, mapping, and monitoring of noxious weeds listed in WAC 16-750. Program staff works with communities to develop local community standards for weed control and to coordinate weed control efforts to maximize their effectiveness and efficiency. KCNWCP also provides incentives and support to landowners to facilitate weed control in areas of high public benefit, and engage in research and development of new weed control technologies.

5.3.8 Agriculture

Management and regulation of agriculture (horticulture and livestock production) has been a unique situation in King County. The County has spent considerable effort and money to protect

and promote agricultural lands and industries. This has been done to support agriculture based economies, provide for availability of locally grown products, and protect the rural, agrarian lifestyle. To help with this, agricultural lands and activities tend to receive less-restrictive regulations to ensure the economic viability of agriculture. Unfortunately, many agricultural areas surround, straddle, or are adjacent to aquatic areas or are situated in drained and radically modified floodplains that historically had extensive and productive aquatic habitats, such as side-channels, oxbow ponds, springs, and wetlands in particular (Bissonnette 2003). As a result, there is often conflict between agricultural and aquatic, wildlife, and wetland resource protection goals.

To help resolve this conflict, King County has expended considerable effort in studying the effects of agriculture and has implemented a series of projects to update and monitor Best Management Practices (BMPs) and develop new ones as needed. These programs have increased our knowledge about agricultural practices and habitat impacts considerably and has been translated into new or improved BMPs (e.g., requirement of vegetated filter strips and winter cover crops and fencing requirement in the Snoqualmie Valley, where it wasn't previously required) in the proposed CAO. See Appendix A: The Effect of Agriculture Operations on Critical Areas for more description of agriculture and proposed BMPs.

5.4 INSTITUTIONAL RISKS AND UNCERTAINTIES

Despite the major King County's investments and advancements described above, some uncertainty and associated risk for aquatic, wildlife, and wetland critical areas remains in at least four elements: roads planning and capital programs, agricultural lands, enforcement, and monitoring. For example, unlike the County's road maintenance program, the roads capital program has not yet engaged in comprehensive planning to help guide its activities in a manner consistent with conservation of aquatic resources; and yet roads can have significant impacts to aquatic resources (Alberti et al. 2003). Road construction (new and redevelopment) will be required to abide by the proposed CAO, but the planning phase of road network design takes place far in advance of most projects and often dictates the alternate placement and nature of the road. If the original road planning did not properly consider impacts to aquatic resources, then regulations can only help to minimize the impact. Further, relying on mitigation is generally unsatisfactory, as mitigation projects often fail to provide full mitigation of impact (King County 1998; Ecology 2000; Ecology 2002).

Effective protection of critical areas will also rely on effective enforcement. Chasan (2000) discusses widespread failure associated with lack of enforcement of environmental laws. Mockler et al. (1998) found that failure to enforce mitigation agreements was a primary factor in poor performance of mitigation. The level of enforcement necessary to ensure compliance with the proposed CAO and Stormwater Manual is unknown.

Finally, monitoring is extensively performed in King County, but a comprehensive summary of this information has not been accomplished. However, data management systems are being developed and a more comprehensive picture based on data collected to date is expected in the next few years. Also, while highly desirable, the presence or lack of monitoring information does not result in critical area impacts, *per se*.

In summary, these major actions and improvements made over the years by King County indicate that the proposed CAO is part of a larger, systematic, and comprehensive approach to protect and restore habitats. This should help to lower the risk associated with standards that depart or fall in the lower range of recommendations provided by best available science literature.