



Science and Technical Support Section 2008–2010 Business Plan

October 2008



King County

Department of Natural Resources and Parks
Water and Land Resources Division

Science and Technical Support Services Section

Science and Technical Support Section 2008–2010 Business Plan

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Department of Natural Resources and Parks
Water and Land Resources Division

Science and Technical Support Section

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The Business Plan

This Business Plan presents the Science and Technical Support Section's (hereafter Science Section) vision, mission, core values, goals, objectives, and actions resulting from the section's 2007–2008 business planning process.

This plan represents a structure that defines the Science Section's services and areas of work including emerging issues and challenges that face the section in the coming years.

This business plan is considered a dynamic or "living" document, and may be continually edited or updated as new relevant information becomes available.

Business Planning Methodology: In order to guide the business planning process and produce a business plan document, a team comprised of the following members was assembled:

- Science Section Manager
- Water Quality and Quantity Unit Supervisor
- Watershed Ecology and Assessment Team Supervisor
- Two Science Section staff members
- Private consultant

The Science Section hosted a series of seven workshops open to all section staff members in order to:

- Identify internal and external forces that drive the Science Section's work;
- Reflect on the Science Section performance and services;
- Identify regional scientific data gaps;
- Identify emerging issues and technologies;
- Establish a mission statement and Build a shared vision; and
- Establish section-wide goals, objectives, strategies, performance measures, and implementation activities.

In addition to the workshops, staff input was solicited through e-mails, informal one-on-one discussions, and through a forum-style website set up specifically for the business planning effort.

I. Introduction



Staff members Kevin Li and Jonathan Frodge, conducting water quality sampling.



The Science and Technical Support Section of the Water and Land Resources Division is responsible for collecting, analyzing, modeling, and interpreting the information that informs land use, habitat management, sewage treatment, water resource, and surface water management decisions. The section is also responsible for providing objective scientific knowledge to inform and guide important policy and management decisions that protect the overall quality of life for King County residents, visitors, and decision makers.

King County has been engaged in conducting environmental monitoring for over fifty years. During this time, the knowledge gained from proactive environmental

assessment has provided for a more cost-effective expenditure of public funds and has helped the County anticipate and identify environmental issues and maintain public health and safety. Without the valuable baseline data collected during the past five decades, tracking progress toward long-term goals and projecting the long-term environmental response to management decisions and actions would not be possible.

Consistent proactive environmental assessment is also essential for the development and informed use of environmental indicators. Environmental indicators and agency performance measures provide essential guidance to county programs and investment

decisions. These metrics are used to inform the community, private sector, and government agencies, on environmental conditions. They are used to:

- affect law and policy;
- promulgate and evaluate plans including their effectiveness;
- provide for public and environmental health; and optimize efficiencies in all institutional and environmental sectors.

II. Science and Technical Support Section Work Activities Overview

The Science Section work activities are structured in the following areas:



Aquatic Ecosystem Health: The levels of toxic contaminants, pathogens, and nutrients in the aquatic environment, and their impact on sediments, aquatic species, human uses, and human health;



Ecohydrology: The status and health of lakes, ponds, rivers, streams, wetlands and groundwater; determination of river and stream flows; including groundwater levels; and, their ability to sustain people, fish, wildlife, and natural functions;



Ecology: Distribution and abundance of species and communities and the interaction between organisms and their environment; and



Habitat and Watershed Processes: The status, protection, restoration, and sustainability of freshwater, estuary, nearshore, marine, and upland habitats.

The Science Section provides the following services:

- Evaluation of environmental assessments and other information for projects by other organizations;
 - Inform, advise, review, and support implementation of regional plans and policies;
 - Provide public educational services;
 - Develop, operate, and maintain computer applications for the storage, analysis, and distribution of environmental data;
 - Scientific literature reviews and synthesis.
 - Long-term monitoring of receiving waters of wastewater treatment plant and CSO outfall discharges in support of NPDES permits (National Pollution Discharge Elimination System).
 - Monitoring for stormwater NPDES permit procurement and permit compliance; and
 - Other regulatory compliance monitoring; e.g., swimming beaches, Urban Planned Developments (UPDs), the Critical Areas Ordinance (CAO).
- Long-term monitoring of environmental conditions to determine status, changed conditions and trends;
 - Pre-construction, during construction, and post-construction project effectiveness monitoring;
 - Site characterization to support operational needs;
 - Input to, and support of promulgation, amendment and implementation of environmental laws, policies, regulations and plans;
 - Support for obtaining construction permits or conducting environmental reviews;
 - Modeling of hydrology, hydrogeology, water quality, chemical mass balance, and food web bioaccumulation;

III. Drivers for Change – Environmental Scan Results

Introduction

During the business planning process, an environmental scan was utilized. It included a section self audit exercise conducted to identify, review, assess, and evaluate internal and external strengths, weaknesses, issues, and opportunities. As part of the process, Science staff and management also explored emerging issues and forces relevant to the environment in which the workgroup operates. These issues, trends, and opportunities are important considerations when revisiting the strategic direction of an organization and served as context for the developing the vision, mission, and goals for the section. Highlights from those discussions are presented below.

Drivers

The Section used the identified strengths, challenges; opportunities and emerging issues to prioritize what would be called “Drivers for Change.” These drivers would be used to fully initiate the business planning effort. The following significant challenges and changed conditions were used to set forth new goals:

- Increased requirements in the Municipal Stormwater NPDES permit
- An increasing demand for scientific expertise by the newly formed Puget Sound Partnership
- New Population Growth and Land Activity projections identified in the Puget Sound Regional Council’s Vision 2040 Plan and EIS
- An increasing demand as a technical resource to King County climate change efforts
- An increasing demand for scientific information to inform KingStat environmental indicators
- An increasing demand as a technical resource to King County biodiversity efforts
- Detecting emerging chemical and biological threats
- Formulating effective responses to climate change
- Improving and enhancing internal and external communications for collaboration between and coordination of projects, programs, agencies and the public;

- Lack of unifying goal or purpose within the Science Section
- Future Science Section financing changes to meet new regional initiatives and address declining revenues

Primary Areas of Science Section Emphasis

For 2008-2010, the Science Section considers the following areas to be of priority when allocating resources. These emphasis areas are in response to and result from Drivers described in Section III:

- Regulatory Monitoring
- Client-driven Activities
- Work in support of the Puget Sound Partnership
- Work in support of the King County Climate Change Plan
- Work in support of KingStat environmental indicators
- Work associated with new growth projection and land use impacts on King County water and land resources



Summer interns and Science Section staff evaluating the health of juvenile salmonids along the Green River. Photo by Tom Nelson.

Regulatory Monitoring and Client-driven Activities

The Science Section has long standing clients and service initiatives related to water quality and quantity. This would include work related to combined sewer overflow and wastewater NPDES support; swimming beach monitoring. This work also includes supporting project planning, permitting, and construction activities associated with capital programs from wastewater treatments plants to Urban Planned Developments (UPDs). The Science Section also collaborates with other agencies in activities such as macroinvertebrate monitoring and data sharing, and monitoring river and stream temperature and flows.

Clients, customers, decision-makers, and the public depend on many of these historic and baseline monitoring and assessment programs. The section utilizes and distributes portions of this environmental information and analysis as material for public education.

Formation of Puget Sound Partnership

In 2007, with the King County Executive as a founding member of the Ecosystem Coordination Board, the Puget Sound Partnership (PSP) was created to coordinate the recovery of Puget Sound from the mountaintops to the deep marine waters by 2020. The PSP was also charged with creating a coordinated, collaborative monitoring program by basing its recovery actions on a strong science foundation

King County has helped effectively manage natural resources and support the central Puget Sound region in its management of water quality, fisheries, marine waters, shorelines, lakes, rivers, streams, and the lands that drain to these water bodies. The Science Section's management and staff are being called upon to serve the PSP in various capacities, including providing scientific expertise in multiple disciplines and providing high quality data and interpretation for decision-making.

Puget Sound Regional Council (PSRC)

The Puget Sound Regional Council is scheduled to adopt VISION 2040, the regional long-range growth management, economic, and transportation strategy for the central Puget Sound region. VISION 2040 contains the region's multi-county planning policies, which are required by the Washington State Growth Management Act. It provides a comprehensive regional approach to manage growth through the year 2040. VISION 2040 covers King, Kitsap, Pierce, and Snohomish counties and their respective cities and towns.

Some of the key elements of the draft VISION 2040 are a numeric regional growth strategy to achieve closer balance between jobs and housing within the counties and regional geographies. The program addresses issues in distinguishing between different roles of regional geographies, and supporting growth in designated regional and subregional centers.



Section staff constantly assess and inventory marine aquatic life and habitat. Photo: Kim Stark.

For population, the draft VISION 2040 calls for more growth in cities with regional growth centers and in larger cities, and for minimizing rural growth. For employment, the draft VISION 2040 calls for continuing the current locally adopted policies for employment growth which emphasize a concentrated regional pattern with a focus on centers.

The Science Section will be evaluating the long term impact of growth on receiving waters and biodiversity.

2007 King County Climate Plan

The 2007 King County Climate Plan presented an ambitious plan for mitigation and adaptation to climate change. One focus area of the plan’s adaptation strategy was King County science and technical capacity. As a result, fourteen of the plan’s objectives are related to scientific understanding of the impacts of climate change in King County. The level of effort associated with meeting these objectives ranges from low (objective met by existing activities or minor changes to existing activities) to medium (additions to existing programs) to high (new programs). The level of funding support necessary for implementing climate-related scientific activities also varies depending upon the specific activity proposed to meet the stated objective.

The 2007 King County Climate Report (released in February 2008) continues to emphasize the important role of King County’s scientific and technical experts and states, “In the coming year, King County’s scientific and technical experts will continue to be tapped for contributions to local, regional and state analysis of climate change. To meet this responsibility, the county may require greater funding for scientific and technical capacity.” Also noted in the report is, “...King County technical experts in the Water and Land Resources Division continue to be in demand for contribution to scientific and technical reports, as well as for staffing to the King County Climate Team.”

The Science Section and Environmental Laboratory are key components to the Department of Natural Resources and Parks meeting its county climate plan obligations, and the ultimate success of the county’s climate plan. They are in a position to be viewed as a credible source of information and guidance to the region in the application of climate change science to local government operations and decision-making. However, resource limitations exist due to funding shortfalls from annexations and increased capital requirements.

Climate Change Science Section Objectives

	Goal	Objective
1	King County will be a primary leader in research, monitoring and use of climate science in public policy decisions.	King County will create a climate change technical advisory group within the climate change adaptation team.
2	King County will be a primary leader in research, monitoring, and use of climate science in public policy decisions.	King County Water and Land Resources Division’s Science, Monitoring and Data Management Section (Science Section) will place particular emphasis on understanding climate change impacts on environmental conditions in King County.
3	King County will be a primary leader in research, monitoring, and use of climate science in public policy decisions.	King County Water and Land Resources Division’s Science Section will provide climate change science to policymakers for consideration in policy and regulation.
4	King County will be a primary leader in research, monitoring and use of climate science in public policy decisions.	King County Water and Land Division’s Science Section will develop additional research areas for its ambient monitoring program and collaborations with the Climate Impacts Group.

(Continued)

Climate Change Science Section Objectives

	Goal	Objective
5	King County plans will guide the region to build preparedness for climate change impacts into all major investments in land and infrastructure.	King County's interdepartmental climate change adaptation team will support review of all King County plans, policies and investments, with information about predicted climate change impacts.
6	King County will help the region to understand and reduce risks of possible coastal flooding associated with climate change impacts.	King County will collaborate with climate scientists and the Federal Emergency Management Agency to evaluate and plan for the potential impacts of coastal flooding associated with sea level rise.
7	King County will protect the integrity and safe operation of regional transportation infrastructure from climate change impacts.	King County climate change technical advisory subgroup will train Road Services Division staff in climate change impacts information and updates.
8	King County will work to understand and share information about climate change impacts to safe and reliable drinking water supplies and protection of fish and wildlife habitat conditions.	King County will develop a workgroup within the Department of Natural Resources and Parks to address climate change impacts to instream flows.
9	King County will work to understand and share information about climate change impacts to safe and reliable drinking water supplies and protection of fish and wildlife habitat conditions.	King County will work with state, regional and local governments and leaders to address concerns of climate change impacts to safe and reliable drinking water supply and protection of fish and wildlife habitat conditions.
10	King County will help the region to ensure regional freshwater quality for drinking, irrigation and fish and wildlife.	The proposed climate change technical advisory group of King County's climate change adaptation team will continue to monitor and develop research on climate change impacts to water quality in lakes and rivers.
11	King County will work to support the resilience of salmon, fish, wildlife, habitat conditions and biodiversity to climate change impacts.	King County will collaborate with regional climate scientists and experts, in order to increase knowledge of current and projected climate change impacts to salmon, wildlife, and biodiversity.
12	King County will work to support the resilience of salmon, fish, wildlife, habitat conditions and biodiversity to climate change impacts.	King County will evaluate its existing ambient monitoring program to determine whether additional biodiversity monitoring will be needed as new climate change information emerges.
13	King County will work to support the resilience of salmon, fish, wildlife, habitat conditions, and biodiversity to climate change impacts.	King County will work to incorporate predicted climate change impacts into King County salmon recovery plans, programs and activities.
14	King County will protect the unique, productive, and diverse marine environment of the region from climate change impacts.	King County will help the region to understand and adapt to predicted climate change impacts to marine waters.

KingStat Environmental Indicators

King County uses environmental indicators to review environmental trends, identify environmental drivers for change, and informs the public of existing responses and priority new actions. Consistent environmental assessment is essential for the development and continuous update of environmental indicators communicated through King Stat. Science Section staff currently provides data analysis and scientific information and interpretation on an annual basis in support of King Stat. As new indicators are developed and existing indicators are evaluated and improved, increased demands on Science Section staff time are expected. The following diagram illustrates the King Stat Aquatic Environment Category. The data noted in the lower boxes; e.g., phosphorous, fecal coliform, or armoring is the indicator data needed for evaluating the status of a given water resource.

King County Biodiversity Initiative

The King County Biodiversity Report is one product as part of Local Action for Biodiversity (LAB). Lab partner organizations, all of which are represented on the Lab Steering Committee, include Local Governments for Sustainability, International Union for the Conservation of Nature (IUCN), IUCN's Countdown 2010, the South African Nation Biodiversity Institute, and Roma Natura. King County joined the initiative in 2007. This report, completed April 1, 2008, fulfills a major commitment for King County as a founding participant in ICLEI's Local Action for Biodiversity (LAB) project.

Successfully achieving biodiversity conservation throughout the county will require current and comprehensive information about the biodiversity of the county, the use of innovative analytical methods for determining the state of biodiversity, tools for biodiversity conservation, and a set of coherent, integrated policies that speak directly to biodiversity throughout the county.

Although this goal has been prominent in the county's comprehensive plan for several years, no strategy specific to biodiversity conservation has yet been developed.

The work continues through 2010 with the following elements:

- During 2008 and 2009, Science Section staff members will be developing a biodiversity framework and strategy;
- In 2009 the Science Section will prepare a draft of King County's biodiversity plan;
- In 2010 the Science Section, in cooperation with other King County divisions and departments, will implement five biodiversity projects; and
- A final report will be submitted to LAB for dissemination to other participants in the program and to new members worldwide.

The biodiversity framework is already in development by the Science Section. Taking information, principles, and concepts from previous work on aquatic systems and salmon conservation and from the latest conservation science, the outline of a strategy is emerging.

Financial and Budget Change

The Science Section is supported in part by the Wastewater Treatment Division's Water Quality fund, the Surface Water Management (SWM) fees, Flood Hazard Reduction Services, and Solid Waste. Other science funding sources come from partnerships, grants, King County departments, and other agency and jurisdiction contracts. The Science Section does not receive King County general funds or funds generated by other permits.

Surface Water Fund revenues are projected to decline by 2010 as a result of annexations. These SWM fund decreases coincide with increased demands resulting from new municipal stormwater National Pollution Discharge Elimination System (NPDES) permit monitoring and programmatic requirements. Additionally, WTD science services' financing could be refocused to meet capital and operating cash flow projections in 2009 and beyond.

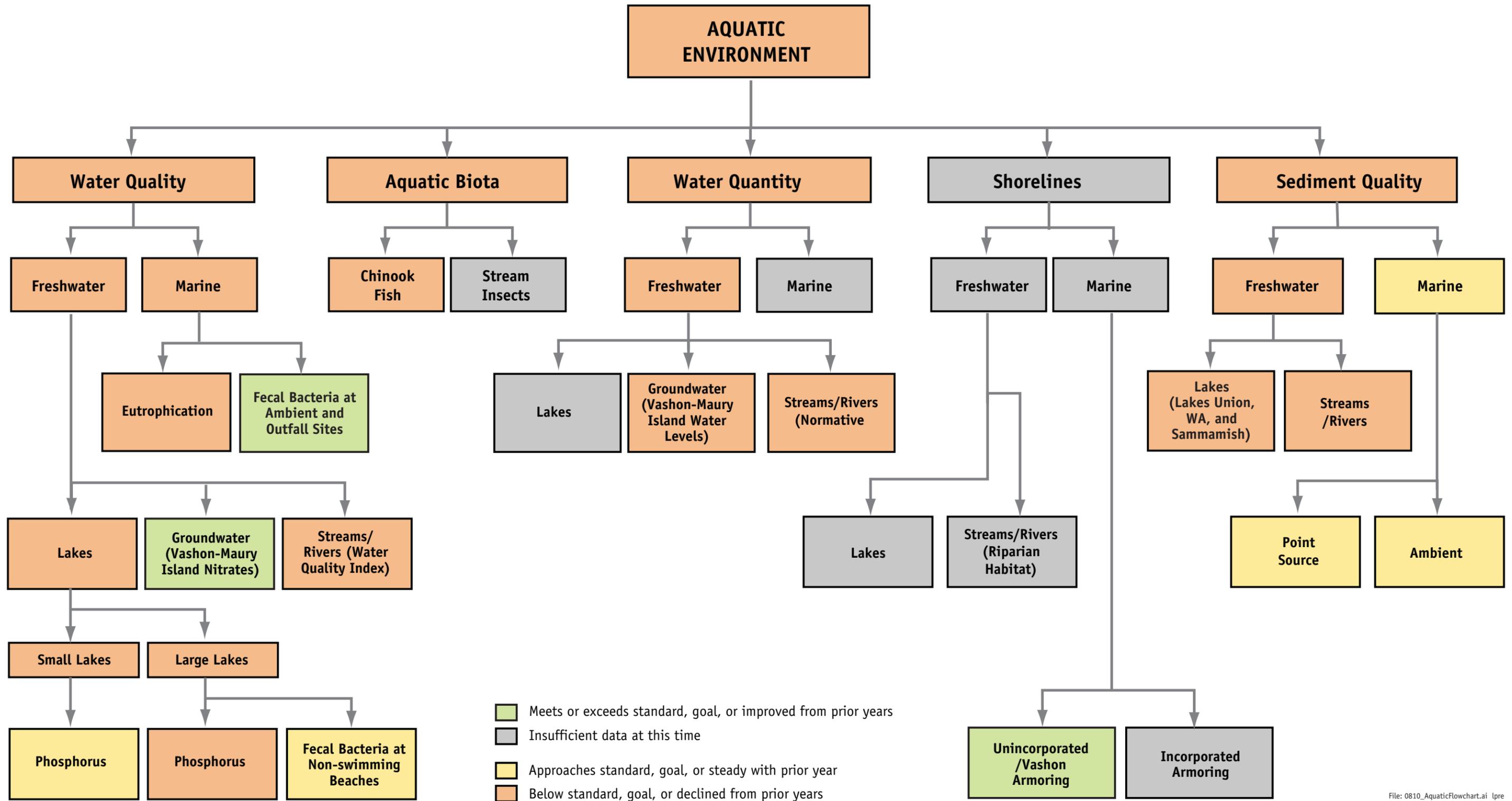
It is recognized that the Science Section does not have, and is unlikely to have, sufficient resources through its traditional funding sources to be able to achieve the vision, goals, and objectives detailed in the business plan without building on existing funding efforts and developing reliance on new funding resources. Therefore, the Science Section is actively engaged in the development of a



This eagle represents part of the biodiversity in King County. The section monitors the quantity and quality of waters that provide for food source for itself and its prey. This ensures that the food chain is healthy and productive. Photo: Kim Stark.

comprehensive funding strategy for 2009 and beyond. And the section will prioritize its activities to meet the King County needs using these areas of emphasis:

- Regulatory Monitoring
- Client-driven Activities
- Work in support of the Puget Sound Partnership
- Work in support of the King County Climate Change Plan
- Work in support of KingStat environmental indicators
- Work related to the Puget Sound Regional Council Vision 2040 Growth projection impacts on King County water and land resources



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Water and Land Resources Science and Technical Services Section
Performance Measures

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IV. Science Section Vision, Mission, Values and Goals

The drivers, priorities, significant challenges, and changed conditions were used to set forth the Science Section's new vision, mission, and goals as outlined in section IV. The Section also defined its values, set forth objectives, strategies, and performance measures designed to provide continued improvements, innovations, and enhancement of science services. This section also defines how the section addresses the challenge related to "the lack of a science section unifying goal or purpose."



Environmental Laboratory and Science staff positioning a water quality monitoring buoy to collect data on dissolved oxygen and turbidity (clarity) in Puget Sound. Photo: Kim Stark.

The Science Section Vision Statement

A vision statement focuses on the future by answering the question, "Where do you want to go?", and by defining the ultimate result of an organization's work. It should serve as an inspiration to those who work within an organization and provide the framework for strategic planning. The section vision statement is:

"Healthy and sustainable ecosystems."

The Science Section Mission Statement

A mission statement focuses on the present and is a brief description of an organization's purpose. It answers the question, "Why do we exist?" and articulates the organization's purpose both for those internal and external to the organization. The section's mission statement meets that definition and reads as follows:

"To provides scientific knowledge, information, and analysis in support of regional environmental resource management."

The Science Section Core Values

Core values are a reflection of an organization's culture and priorities and should be protected during times of change. After lengthy discussion the science staff developed the following value statements:

We value "Excellence":

We strive for excellence. We focus our work on making the section, division, department, and county better. We provide quality service through science and solution oriented practices.

We value "Integrity":

Integrity means we value principles over personal interests. We interact with coworkers, clients and the public with a spirit of respect, sincerity, and professionalism. We treat our coworkers, clients and the public in an open, fair, and ethical manner.

We value "Teamwork":

Teamwork means all staff within the section cooperates communicate and respect each other's needs in working to realize our mission and vision. Teamwork allows us to combine energy and creativity to benefit the county and those we serve.

We value "Accountability":

We recognize the critical nature of our vision, mission and values and their relation to the quality of life in King County. This compels us to seek solutions and accept responsibility for our actions.



King County still possesses high quality environmental areas conducive to providing excellent water quality that has the potential to support biodiverse habitats. One of the key roles the section plays is to monitor the health of the waters, flora and fauna that reside in these limited open spaces. Photo: Ned Ahrens.

We value “Communication”:

We recognize the two-way nature of communication and know the value of listening as well as the importance of expressing ourselves. We value each individual’s point of view. We focus on issue-oriented communication with our coworkers, our clients, and the public.

Science Section Goals

Goals are the longer-term, qualitative benchmarks of success in terms of outcomes and functions which give direction to an organization and the utilization of its resources in accomplishing the mission and pursuing the vision. The section has four goals:

- Assess the health and condition of the environment;
- Promote application of our scientific data and information;
- Maintain a robust scientific organization; and
- Provide useful scientific services.

Science Section Objectives

An objective is a specific measurable result expected within a particular time period in order to accomplish the goal. It can be thought of as a clear “milepost” along the strategically chosen path to the goal. For the Goal of “Assess the health and condition of the environment” the section identified three objectives:

- Maintain and improve data quality and management;
- Analyze and assess status and trends of

ecosystems; and

- Advance understanding of ecosystem structure function and processes.

For the goal of “Promoting application of our scientific data and information” there are two objectives:

- Raise awareness of data and information to potential users; and
- Increase accessibility to data and information.

The section identified five objectives for the goal of “Maintaining a robust scientific organization”:

- Hire and retain qualified and successful employees;
- Create an environment of accountability and support;
- Be responsive to shifting county priorities;
- Ensure necessary resources are available to staff; and
- Ensure scientific credibility.

For the goal of “providing useful scientific services,” the section established three objectives:

- Support county initiatives and policies;
- Provide leadership and support to regional and multi-jurisdictional program and partnerships; and
- Support county and other jurisdictional projects and programs.

2008 - 2010 Business Plan Implementation Chart



MISSION

To provide scientific knowledge, information and analysis in support of regional environmental resource management.

VISION

Healthy and sustainable ecosystems.



Department of Natural Resources and Parks
Water and Land Resources Division
Science and Technical Support Services Section

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V. Strategies, Implementation Activities and Performance Measures



Water clarity is of great importance to this Great Blue Heron as it waits for its prey. Photo: Kim Stark.

For the Environmental Assessment goal and objectives, five strategies were identified. For the strategy of “Maintaining and improving data quality and management” one strategy was put forth:

- Integrate data management across the section

For the objective of “analyzing and assessing status and trends of ecosystems” three strategies were identified:

- Target resources on high priority environmental monitoring;
- Identify and evaluated emerging threats;
- Model future conditions;

And for the objective of “Advancing understanding of ecosystem structure, function and processes” one strategy was called for:

- Conduct applied research as needed;

In the outreach category three strategies were called out; two for the objective of “raising awareness of data and information to potential users,” and one for “increasing accessibility to data and information.”

For the first objective the strategies are:

- Develop and implement a section-wide communications plan consistent with the Water and Land Resources Division and the Department of Natural Resources and Parks plans;
- Provide support and education services in coordination with the Department of Natural Resources and Parks Public Affairs group;

Section V of the Business Plan outlines Strategies, Activities and Performance Measures for the sections Goals and objectives. Strategies state how goals and objectives will be achieved. The associated activities identify specific actions, programs, initiative, or projects that would be implemented to meet the intent and purpose of the goals, objectives and carry out the strategy.

For the second objective “Increasing accessibility to data,” the strategy is:

- Develop user friendly databases, websites, and publications;

The Operations and workforce goal of “Maintaining a robust Science Section” had five objectives. To reinforce the objectives seven strategies were identified.

For the “hiring and retaining qualified and successful employees” objective, the resulting strategy is:

- Foster an organizational culture conducive to hiring and retaining a high performance and motivated work force;

For the objective of “creating an environment of accountability and support” two strategies were established:

- Support staff professional development; and
- Develop consistent accountability practices.

The objective of “being responsive to shifting county priorities” has one strategy:

- Ask stakeholders and customers about future needs on an ongoing basis.

The objective of “Ensuring necessary resources are available to staff” has two objectives;

- Develop and pursue long-term funding strategies; and
- Transfer institutional knowledge.

And finally, the objective of “ensuring scientific credibility,” has one objective:

- Define internal and external review protocols.

For the services goal of “Providing useful scientific services” three objectives were identified. The three objectives have seven strategies on how the goal will be achieved.

For the “Support county initiatives and policies” objective two strategies were called for:

- Participate and contribute to county initiatives and policies.
- Increase visibility of staff and services to decision-makers.

The objective of “providing leadership and support of regional and multi-jurisdictional programs and partnerships” has three strategies:

- Participate on regional committees.
- Identify needs and opportunities for regional approaches
- Work with management and elected officials to best represent county interests.

Finally, the objective of “supporting county and other jurisdictional projects and programs,” has two strategies:

- Deliver excellence in customer based service
- Market services to present and potential customers



Macroinvertebrates such as amphipods (above) and polychaete worms (below) are known salmonid prey. Their numbers and health are important indicators of overall ecosystem integrity. Photos: Christopher Barnes.



VI. Measuring Performance

Science Section Performance Measures

The Science Section developed specific performance measures to assess the extent to which the goals, objectives, strategies, and implementation activities presented in this business plan have been achieved. The Science Section uses its performance measures to determine its level of success and to identify methods to improve service delivery.

For the environmental assessment goals, objectives, strategies, and work programs will use two performance measures:

- The percentage (%) of King Stat environmental indicators delivered on time;
- The percentage (%) of projects with annually approved Sampling Analysis Plans (SAPS) or Quality Assurance Project Plans (QAPP).

For the outreach component, there are four performance measures. One of these measures is for section management only. The four measures are:

- Number of data requests and/or downloads;
- Percentage of data available via direct downloads on the web;
- Number of citations in media reports;
- *Number of papers presented at conferences.

*(The last performance measure is a section management only measure for internal purposes).

For the operations and workforce component of goals, objectives and strategies three performance measures were defined, with one as a section management only measure for internal purposes. The measures are:

- *Percentage of staff attending scientific conferences and/or professional training;
- The amount of funding from core sources;
- The amount of funding from grants and other non-core sources.

*(denotes that the measure is for section management only)

And last, the goal of providing scientific services has three performance measures:

- The amount of staff time or dollars billed to capital projects;
- The percentage of projects and activities completed on time; and
- The number of partnerships.



(Left) Environmental Laboratory staff member conducting marine beach nearshore water quality sampling in Puget Sound. Photo: Kim Stark.



Anchoring a screw trap on the upper Green River to capture and evaluate the health of juvenile salmonids. Photo: Craig Holman.

VII. 2008 Science and Technical Support Section Implementation Activities



Environmental Laboratory science staff taking a sediment sample on the nearshore of Puget Sound.

This section provides a brief overview of 2008 work programs and projects that are being executed by the science staff. These projects are part of the initial implementation of the 2008 Science and Technical Support Section Business Plan. See the summary chart which provides a relational review of the Business Plan's goals, objectives, strategies, performance measures and 2008 Implementation Activities.

Critical Area Ordinance (CAO) - US Environmental Protection Agency grant project summary

This project assesses the effectiveness of current land use regulations at protecting aquatic environments in developing rural areas. Regulatory implementation and corresponding changes in land cover, hydrology, water quality, channel complexity, and biology will be tracked and compared among six transitioning rural treatment, and three reference sub-watersheds. (See Pursue Additional Grants [#9] section for more details)

Work with Water and Land Resources and Wastewater Treatment Divisions Staff and Management

As part of the Science Section's on-going administrative and coordinating activities, Section management are examining projects, programs, both historical and new to more effectively monitor, analyze and disseminate data. This also includes improving collaboration and coordination methods such as participating on wastewater committees and in selected management team meetings.

Stormwater NPDES Monitoring Program

Stormwater is a significant stressor affecting the health of the Puget Sound ecosystem. Efficiently and effectively managing stormwater to reduce harm to the ecosystem is a common goal of local, state, tribes and federal governments and agencies, environmental groups, the business community, and the citizens of Puget Sound. The Science Section staff is actively participating in a coordinated, integrated approach to quantifying the storm water problem in Puget Sound and evaluating the effectiveness of our management activities.

The goal is to develop a sustainable, cooperative program that provides meaningful management data; promotes greater understanding of storm water issues in the environment; supports a larger, integrated effort to protect and restore Puget Sound; can be adopted by the Department of Ecology for National Pollutant Discharge Elimination System (NPDES) permits; and is appropriate for NPDES permit holders.

Model Water Resources and Nitrogen on Vashon/Maury Island

The purpose of this study is to evaluate the role of nitrogen in the risk of lethal, low-level oxygen events in Quartermaster Harbor, to recommend policy changes in the 2012 King County Comprehensive Plan update for nitrogen management on Vashon-Maury Island, and to assess management options for implementing the recommended policy changes. (See Pursue Additional Grants [#11] section for more details).

Create and Distribute Section Brochure

The Science section brochure is designed to define and describe the services provided by the section; the temporal nature of science services; the expertise of staff within the section; and the benefits and beneficiaries of programs and activities.

The brochure's purpose is to assist other agencies, the public and decision makers in understanding what the section does, how to contact the staff and how to access the information or services.

Specifically, the Science Section's intent and purpose is to educate the "value and benefits" of Environmental Sciences. Specifically:

- who we are;
- what we do; and
- the public and environmental value of science.

Create and Distribute Section Newsletter

The Science Section is will be developing quarterly newsletters starting with two newsletters in 2008. The section will also produce an electronic version of the letter for internet and web access.

The news letters are designed to assist in marketing and promoting the section's services. The section desires to increase awareness of its programs, staff expertise, services, emerging issues, and changing conditions.

The newsletter name is Sci FYI (Science For Your Information). It will consist of, but not be limited to, short and understandable articles on science program activities, projects; emerging environmental issues; state, federal, and local grants; collaborative programs and partnerships; and staff activities.

Participate in Departmental Media and Outreach Activities

The Science Section will allocate staff expertise, materials, and time to promote both the Department of Natural Resources and Parks and the Water and Land Resources Division. Beginning in 2008, Science Section staff began to actively participate in promoting job opportunities as part of the department's Environmental Career Showcase recruiting program. Section staff provided material,

staffed booths, and provided public education. The staff also supported efforts related to the department's Career Day and other exhibits. These activities play a significant role in marketing science services and providing public education.

Create a Centralized Section Web Site

During 2008 the section will begin developing a plan and work program for implementing a centralized website in 2009. The new website will work within the OIRM Content Management System and utilize a number of mechanisms for linkages to relevant and related data, including enhanced hierarchical base data by subject matter and keywords.

The system will greatly enhance the delivery of information which meet the intent and purpose of the outreach category goal of "Promote application of our scientific data and information."

Conduct All-Staff Section Meetings

During late 2007, science staff made an effort to hold all staff meetings on a more frequent basis. The Science Section basically consists of two units; one unit addressing issues on habitat, fish, ecology, etc., and the other focusing on water quality and quantity for both Marine and Freshwater resources.

However, as the staff and issues changed, more collaboration and coordination was needed between all staff disciplines along with the need of insuring that information that was common to all staff could be communicated and questions address to the benefit of everyone.

The practice of having "all staff meetings" on a regular basis promoted a new unity, including enhancing and improving in section communications and collaboration. It is a significant operational and management benefit with minimal costs to implement. This activity goes a long ways in meeting



The Double-crested Cormorant is a common winter resident that feeds on schooling marine fish, slow-moving fish, and other animals including crustaceans and amphibians. Photo: Jennifer Vanderhoof.

the operations and workforce goal of “maintaining a robust Science Section.”

Review Performance Measures and Develop Additional Ones as Needed.

As part of the business planning process the Science Section developed a performance measures for he of the four goals. It is important to keep the methods and measures used to assess success current and relevant. The activity of reviewing the measures is part of an annual section maintenance and operating activity. Irrelevant and out of date measure do not add relevance to the sections mission and activities and does not provide opportunities for enhancing staff expertise and section services and service delivery.

The activity of reviewing performance measures for replacement, removal or amendment is a valuable exercise and provides for consistent accountability practices

Pursue State and Federal Funding through the Puget Sound Partnership (PSP)

To meet the objective of “ensuring necessary resources are available to staff” the strategy to develop and pursue long-term funding strategies was developed. The effort to clean up Puget Sound is a long term program. The implementation activity to pursue state and federal funding is a viable approach for the Science Section and assists in meeting and achieving several other objectives and goals.

During 2008, King County’s Science section, including the Water and Land Resources Division and the Department of Natural Resources and Parks are receiving funds from PSP for staffing of PSP programs.

Pursue Additional Grants

For 2008, the science staff working with local conservation groups, agencies and other organizations to provide funding for much-needed research on a number of important natural resource projects was successful in receiving the following funding awards:

1. Evaluation of downstream out-migrant salmon production and timing from the Cedar River and Bear Creek

- Amount awarded: \$214,000
- Project dates: January 2008-November 2008
- Granting institution: King Conservation District
- Partners: Washington Department of Fish and Wildlife and Seattle Pacific University

The purpose of this project is to document freshwater survival of salmon in two major spawning areas in WRIA 8. These data are used in combination with adult spawning ground surveys to understand factors that influence the productivity of salmon within the Cedar and Bear Creek basins.

2. Chinook spawning ground surveys

- Amount awarded: \$132,848
- Project dates: September 2008-May 2009
- Granting institution: King Conservation District
- Partners: WDFW and SPU



The Science and Technical Services Section analysis provided a scientific foundation for development of the Shoreline Master Plan and the continuing work with the Puget Sound Partnership.

The purpose of this survey project is to expand and confirm our knowledge of the abundance, productivity, and distribution of Chinook in WRIA 8. This knowledge is needed to aid resource managers and planners in effective resource management and land-use decision making, in regional salmon conservation planning, and to provide information crucial to biological assessments under the Endangered Species Act.

3. Chinook spawning habitat and flow regime assessment in the middle Green River

- Amount awarded: \$50,000
- Project dates: September 2007-May 2009
- Granting institution: King Conservation District
- Partners: None

The purpose of this project is to investigate the incidence of scour on Chinook salmon redds and identify flows at which scour occurs.

4. Predation of juvenile salmonids by trout in the Cedar River

- Amount awarded: \$182,000
- Project dates: January 2008-November 2009
- Granting institution: Seattle Public Utilities
- Partners: U.S. Fish and Wildlife Service and WDFW

Predation is often cited as a limiting factor for juvenile salmon survival in WRIA 8. The purpose of this project is to determine if predation is limiting Chinook survival in the Cedar River during the spring and summer months.

5. Diel and seasonal movements of sub-adult kokanee and their predators in Lakes Sammamish and Washington

- Amount awarded: \$46,200
- Project dates: October 2008-November 2009
- Granting institution: USFWS
- Partners: USFWS, Bellevue/Issaquah Chapter of Trout Unlimited, and Interlake High School Honors Biology Program

The purpose of this project is to determine how kokanee survival is influenced by thermal stratification and how potential predators of kokanee respond to thermal stratification.



Section staff assess the health and numbers of salmon and trout in King County. Bull trout photo: Hans Berge.

6. White River county line floodplain acquisition with levee modification

- Amount awarded: \$1.24 million
- Project dates: March 2008–November 2010
- Granting institution: Salmon Recovery Funding Board
- Partners: Pierce County

The purpose of this project is to modify an existing levee to reestablish floodplain functions in the lower White River.

7. Cedar River side-channel inventory

- Amount awarded: \$45,000
- Project dates: February 2008-December 2009
- Granting institution: King County
- Partners: None

The purpose of this project is to identify the location of side-channels in the Cedar River and provide a baseline habitat survey to understand how the Cedar River changes in response to the implementation of restoration projects. A secondary purpose is to identify potential restoration projects within the mainstem Cedar River.

8. Lake Washington/Cedar/Sammamish watershed habitat status and trends monitoring

- Amount awarded: \$100,000
- Project dates: July 2008 through December 2009
- Granting institution: WRIA 8 Recovery Council
- Partners: Snohomish County, City of Seattle, City of Bellevue, and City of Issaquah

The purpose of this study is to evaluate current conditions of aquatic habitats in WRIA 8 using a probabilistic sampling design and relying upon physical and biological metrics. This work will be repeated over the course of the implementation of the WRIA 8 Salmon Recovery Plan.

9. Critical Areas Ordinance Grant

- Amount awarded: \$625,000
- Project dates: July, 2008 through December, 2012
- Granting institution: U.S. Environmental Protection Agency
- Partners: University of Washington, Urban Ecology Laboratory; U.S. Geological Survey (USGS); Veteran's Conservation Corp (VCC)

10. Salmon Watcher Program

- Amount awarded: \$31,278
- Project dates: May 2008-May 2009
- Granting institution: King Conservation District
- Partners: Cities of Bellevue, Redmond, Seattle, Bothell, Kirkland, Renton, and Woodinville.

The Volunteer Salmon Watcher Program educates and trains watershed residents in salmon life history and identification. After attending a training workshop, volunteers record salmonid presence information semiweekly at stream sites throughout the Lake Washington Watershed and streams in the WRIA 8 nearshore during the salmon-spawning season (September-December). Volunteers submit data sheets monthly to document their observations. These volunteer data augment existing technical data collected by the sponsoring resource agencies. Resource managers use the information to help identify fish passage barriers and focus professional surveys. The data are also used to identify yearly fish run timing and spawning activities, document the extent and diversity of adult spawning salmonids, and provide insight on the effectiveness of local restoration projects.

The purpose of this study is to evaluate the effectiveness of current land use regulations at protecting aquatic environments in developing rural areas. Regulatory implementation and corresponding changes in land cover, hydrology, water quality, channel complexity, and biology will be tracked and compared among six transitioning rural treatment,



The successful Salmon Watcher Program gathers useful study data and encourages an ethic of environmental stewardship in the community. Here volunteers wear polarized glasses for easier salmon spotting.

and three reference sub-watersheds. Findings will be applicable to much of lowland Puget Sound and directly address high priority USEPA, Puget Sound Partnership, King County, and Watershed Salmon Recovery Plan objectives.

Outputs include recommendations on regulatory implementation and compliance, and information on biophysical, hydrological, and water quality responses.

Outcomes include:

- A. A natural-experiment for assessing a suite of land use regulations through time;
- B. Locally derived empirical measures of effectiveness at multiple scales;
- C. A model framework for assessing regulatory effectiveness elsewhere;
- D. Inputs for King County's performance measures; and
- E. Partnerships and training opportunities with our collaborators and other local governments.

11. Model Water Resources and Nitrogen on Vashon/Maury Island

- Amount awarded: \$625,000
- Project dates: January 2009 – December 2012
- Granting institution: U.S. Environmental Protection Agency
- Partners: University of Washington – Tacoma; Washington Department of Ecology, Vashon-Maury Island Groundwater Protection Committee

The purpose of this study is to evaluate the role of nitrogen in the risk of lethal, low-level oxygen events in Quartermaster Harbor, to recommend policy changes in the 2012 King County Comprehensive Plan update for nitrogen management on Vashon-Maury Island, and to assess management options for implementing the recommended policy changes. Oxygen levels in Quartermaster Harbor have been recorded near lethal levels the past two summers. As a poorly flushed embayment of Puget Sound, Quartermaster Harbor has many characteristics similar to Hood Canal – which has experienced multiple, lethal, low-oxygen events – including increased upland development and nitrogen loading, high value shellfish fisheries, and high value ecological habitat. Sources of nitrogen will be identified and quantified, and nitrogen impacts on dissolved oxygen in Quartermaster Harbor will be modeled. To inform future actions, the degree of improvement in Quartermaster Harbor dissolved oxygen will be modeled for various nitrogen management strategies and compared to conceptual costs of each strategy.

Outputs include surface and groundwater monitoring and assessment, surface-groundwater and receiving water model development and application, targeted onsite septic system studies, and reporting and outreach. Results of these efforts will provide the foundation for recommended policy changes in the 2012 King County Comprehensive Plan update for nitrogen management on Vashon-Maury Island.

Outcomes expected are improved policies in the King County Comprehensive Plan and the implementation of land use management best management practices to reduce nitrogen loading to Quartermaster Harbor and the prevention of lethal low level oxygen events. These outcomes will be useful as a model for other rural areas of Puget Sound.

Develop Intranet Interfaced to Electronic Section Reports

This implementation activity supports transferring institutional knowledge and meeting the objective of ensuring necessary resources are available to staff and meeting the goal of “maintaining a robust Science Section.”

During 2008, Science staff members are currently conducting planning and proposes to develop an electronic library of Science Section’s reports in 2009. The library will have a Web facing interface that allows users to search for reports by keyword, author, title, and subject. A list of reports that matches the user’s search criteria will be displayed to the user. When the user selects a report, the system will display author, title, subtitle, abstract, and links to the .PDF documents in a standardized template.

The current library database, LibraryWorld, will be used to store the reports and LibraryNet Web pages will be leveraged for the Web facing interface. This approach will obviate the need to develop and populate a database, queries, and Web pages resulting cost and time savings. This approach will also reduce duplication of effort as the librarian already enters information on each report into the database as it is published.

Puget Sound Partnership (PSP) Involvement

This implementation activity is designed to meet the goal of “providing useful scientific services by providing leadership and support to regional and multi-jurisdictional programs and partnerships.” One of the strategies is to participate on regional committees.

For 2008 and 2009, the Science and Technical Support Section will be staffing the King County Executive in his role as a member of the PSP Ecosystem Coordination Board. The section is also providing technical expertise to PSP by

- Helping prepare a series of seven working papers that identify knowledge gaps important to the recovery of Puget Sound and the development of the PSP 2020 Action Agenda.
- Participating in PSP topic forum workshops.
- Providing comments on PSP topic forum papers.
- Providing representatives to PSP Habitat Steering Topic Forum Committee, PSP Toxics Loadings Committee, PSP Water Quality Topic Forum Committee, PSP Working Group for Indicators, and PSP Monitoring Consortium.

The Section has also identified six high-priority areas where King County has significant expertise and can play a substantial role in filling knowledge gaps.



Science and Technical Support Services Section summer interns hauling in a screw trap on the banks of the Green River. Photo: Craig Holman.

The Science Section business strategy basically calls for an expanded role as a regional service provider of scientific and laboratory expertise. The basis for this is that:

- King County's widely recognized Science staff and Environmental Laboratory have unique and distinguishing knowledge, skills, and abilities that can form the basis for long-term service provision to the PSP.
- The PSP has a unique opportunity to cost-effectively build upon the county's extensive, existing infrastructure and trained personnel rather than sinking additional public dollars into new infrastructure.
- As a service provider of scientific and environmental laboratory services to the PSP, King County has marine and freshwater monitoring experience and programs that are already in place, are cost-effective, and would enable the PSP to compare future data directly with long-term (over 40 years) datasets.
- The Environmental Laboratory is a premier facility with state-of-the-art instrumentation already in place with demonstrated quality of operation for decades. The Environmental Laboratory is well positioned to provide field and laboratory services necessary to Puget Sound recovery and PSP.

Collect Feedback Regularly to Assess Future Needs and Customer Satisfaction.

Science Section staff will begin a process of more formally communicating with customers and clients regarding science services and project performance. The Section learned a valuable and beneficial lesson for both Science Section staff and management 2006.

In 2006, the Science Section requested that an independent consultant evaluate whether the freshwater monitoring programs were meeting the objectives, including the basis, intent and purpose for the monitoring program and its elements

A preliminary report that summarized the drivers, goals, objectives, and monitoring design for each component in the streams, rivers, lakes, and groundwater monitoring programs was distributed to a number of King County employees on November 8, 2006. Following distribution of the report, the consultants conducted employee interviews. These staff then provided input on how to revise the report. In addition, other King County employees provided written comments to the preliminary report. The main findings received on the preliminary report provided valuable information on understanding why and how the long-term freshwater monitoring program operated. Several common themes emerged:

- Better definition of monitoring program drivers;
- Better definition of goals and objectives;
- Better collaboration;
- More effective data sharing;
- Sampling and analysis plan development enhancements;
- Better spatial representation within King County; and
- General comments on monitoring design.

Finally, a list several emerging issues are identified as potential drivers for future monitoring program changes. This self audit and feedback effort was the catalyst for implementing the development of this Science Business Plan. It is also a necessary mechanism for meeting the challenge of "delivering excellence in customer based service" and striving to meet the goal of "Providing useful scientific services." During 2008, Science Section management initiated feed back from other staff as part of science staff annual performance appraisals. Additional surveys will be conducted at various level and time intervals for staff, projects and services.

