Report to the Office of Financial Management Concerning Monitoring Programs and Associated Databases

Department of Natural Resources
Department of Ecology
Department of Fish and Wildlife
Conservation Commission
Interagency Committee for Outdoor Recreation

Executive Summary

The 2005-07 Biennial Operating Budget contained a proviso that the five above named agencies should provide, by September 2006, a report to the Governor's Forum on Monitoring (FORUM) and to the Office of Financial Management (OFM) and appropriate legislative committees. The report would include monitoring programs and database changes since the completion of the *Comprehensive Monitoring Strategy for Salmon Recovery and Watershed Health* in 2002. Agencies were to also make recommendations on monitoring needing elimination or enhancement.

The survey showed that many monitoring programs had increased slightly in scope and funding. No monitoring programs were recommended for elimination. The highest monitoring needs for expansion include:

- The funding of additional juvenile migrant traps in selected primary watersheds where ESA salmon recovery must be documented so that fish-in and fish-out can be monitored.
- Coupled with fish-in and fish-out the state should implement habitat status trend monitoring at the regional and watershed scale using the framework just completed by the Department of Ecology under contract from the Salmon Recovery Funding Board. The state and the Salmon Recovery Regions will be able to utilize the information to: determine if ESA listed salmon species abundance, productivity, and distribution (VSP criteria) are improving for key primary populations within each Salmon Recovery Region; Determine for each listed species whether there is progress in addressing freshwater habitat and water quality limitations identified by NOAA Fisheries at the time of listing under the federal Endangered Species Act. Determine the status and the trend of water quality by SRR and statewide; Provide statewide information about the effect of changes in land use, vegetation, and the extent of impervious surfaces on habitat and water quality; Provide information for the biennial *State of Salmon in Watersheds* report; and Reduce uncertainty over the role of harvest, hatcheries, hydropower, and habitat in ESA recovery by measuring with known certainty and precision changes in habitat and salmon abundance.

It was found that there have been consolidations of databases within the natural resource agencies leading to efficiencies and better data sharing. In regard to databases within the natural resources agencies, the FORUM recommended that:

- A consolidated GIS hydrography layer for state government should be created. The three GIS hydrography layers residing at DNR, Ecology, and Fish and Wildlife should be combined at housed at Ecology;
- Natural resource agencies should continue to consolidate their internal databases into centralized, more cost-effective systems given the proper planning and funding.
- A separate natural resource Roadmap Module should be developed in conjunction with the ongoing Enterprise Architecture grant management system being developed by OFM.
- If data are to be shared efficiently between the natural resource agencies, the Natural Resource Data Portal should be expanded to include interactive reporting of data residing at different databases within the agencies.

Table of Contents

Introduction

The 2005-07 Biennial Operating Budget contained the following proviso:

> *"(7) The department of ecology, the department of fish and wildlife, the department of natural resources, the conservation commission, and the interagency committee for outdoor recreation shall make recommendations to improve or eliminate monitoring activities related to salmon recovery and watershed health. The agencies shall coordinate with the governor's forum on monitoring and watershed health and consult with the office of financial management in determining the scope and contents of the report.*
>
> *The agencies shall prepare a report detailing all new activity and updating all previously identified activity within the comprehensive monitoring strategy. The report shall identify the monitoring activity being performed and include: The purpose of the monitoring activity, when the activity started, who uses the information, how often it is accessed, what costs are incurred by fund, what frequency is used to collect data, what geographic location is used to collect data, where the information is stored, and what is the current status and cost by fund source of the data storage systems.*
>
> *The agencies shall provide a status report summarizing progress to the* ***governor's forum on monitoring and watershed health*** *and the office of financial management by* ***March 1, 2006****. A final report to the governor's monitoring forum, the office of financial management, and the appropriate legislative fiscal committees shall be submitted no later than* ***September 1, 2006.****" [ESSB6090, Sec. 129]*

This report is intended to meet the conditions of the proviso and constitutes the final report.

How This Report Was Created

The Governor's Forum consulted with OFM to determine whether they would like five separate reports or one coordinated report through the Forum process. They indicated that a coordinated report would meet their needs and that it would create consistency across the agencies in how the assignment was addressed. Therefore, the Forum asked a Steering Committee consisting of identified lead program managers within each of the five agencies to work together to create the document. The initial step involved sending out a survey sheet for each database and monitoring program described in the 2002 Comprehensive Monitoring Strategy and asking the agencies to update the information and to create new survey sheets for any new monitoring or databases. Those were collected and checked for errors and omissions and the appropriate representative notified if information was needed. The results of the survey were used to typify the monitoring changes and monitoring and database relationships. The survey sheets were provided to the agencies in January 2006 with a deadline of April 2006 for returning them to IAC for compilation. The Governor's Forum on Monitoring has been advised of progress during the development, and a progress report was provided to OFM on March 1 as required. The Forum reviewed and edited this document at a special session convened for that purpose on September 11, 2006.

Types of Monitoring

Monitoring can be grouped into four general types: status and trend (extensive) monitoring, project effectiveness (validation) monitoring, baseline or assessment monitoring, and implementation/compliance monitoring.

Status and trend (extensive) monitoring is used to establish the current status of fish populations and habitat and water quality measures and track their changes through time. The spatial scale for this type of monitoring is large and typically ranges from Water Resource Inventory Area (WRIA) to recovery region to statewide. Status and trend monitoring cannot demonstrate cause-effect relationships, rather it is an assessment of actual conditions.

Project effectiveness monitoring is used to track individual projects to determine whether they have been correctly installed and whether projects are performing as expected. For example, were the trees planted along the stream and are they providing shade as intended?

Validation (intensive) monitoring is used to establish a "cause and effect" relationship between fish, habitat, water quality and quantity, and management actions. This monitoring is typically mid to small scale (sub-basin or smaller) and is the most scientifically rigorous and expensive of all monitoring types.

Baseline or assessment monitoring is used to establish a measure that is generally either not repeated (one-time only measurement) or it is repeated infrequently on an inconsistent interval (i.e., once every 10-20 years).

Compliance monitoring is used to track compliance with laws, rules, or benchmarks. For example, the number of Clean Water Act violations that have been committed.

Washington's Comprehensive Monitoring Strategy

The Legislature asked the Monitoring Oversight Committee (MOC) to develop a comprehensive monitoring strategy for the state that would address salmon recovery and watershed health (SSB5637). The strategy was delivered to the Governor and Legislature in 2002. The strategy evaluated existing monitoring and identified monitoring gaps that were important for tracking future conditions of Washington's natural resources and to determine whether management actions to restore habitat and fish populations have been effective. Seventy-six separate recommendations were made that would materially improve our ability to determine the health of Washington's natural resources. Following are the 22 highest priority needs identified by the MOC in 2002.

Table 1. Monitoring Oversight Committee (MOC) 2002 high priority recommendations for additional monitoring and current status.

Line Item	Action Proposed by MOC	Action Agency	Current Status
1	Create Watershed Monitoring Council	TBD	Governor's Forum created in 2004
2	Combine status reports into Watershed Health report card	TBD	State of Salmon In Watersheds Report 2004
3	Continue State Agency Action Plan	TBD	No Action
4	SRFB/NWPCC effectiveness monitoring and EMAP interim protocols for Restoration Projects	SRFB, NWPCC	SRFB implemented effectiveness monitoring in 2003
5	Update annually specific components of SASI	WDFW	No Action
6	EMAP sampling of freshwater habitat, water quality, and fish presence	ECY, WDFW	Not Funded
7	Conduct instream flow studies for critical watersheds	ECY	Some progress 30 of 45 WRIAS need instream flows set
8	Develop intensively monitored watersheds	ECY, WDFW	SRFB funded four clusters. BPA funded two others
9	Develop annual harvest impact analysis	WDFW	Some progress in developing post season chinook report
10	Wild Stock spawner report	WDFW	Minimal action
11	Restore 9 juvenile salmon trapping sites	WDFW	Not funded
12	Universal Data Interface Feasibility Study. FY 2004	IAC/SRFB	Not funded
13	Design, develop and implement pilot interface for habitat and project data. FY2005	IAC/SRFB, WSDOT	Not funded
14	Data coordinator position	IAC/SRFB	Funded since 2003
15	Build Phase 1 of Web Portal	IAC/SRFB	Completed 2002
16	Development of precision and variance estimates	WDFW	Underway for chinook watersheds
17	Install gauging stations in priority watersheds	ECY	11 of 19 priority watersheds monitored
18	Implement 5 additional juvenile salmon trapping sites	WDFW	Not funded
19	Conduct barrier census on state and private lands	DNR	Underway
20	Forest and Fish effectiveness and compliance monitoring	DNR, WDFW, ECY, Tribes	Underway using federal funds
21	Forest and Fish information systems	DNR	Completed
22	Intensification of nearshore sampling	DNR	Monitoring was improved for eelgrass and kelp

Major Changes in Monitoring and Associated Databases Since 2001

Department of Ecology

The Department of Ecology has worked hard to consolidate numerous smaller databases into the Environmental Information Management (EIM) database. Essentially, the Toxic Pollution Studies database, TMDL studies database, and Non-point Pollution Studies database, have all been combined into the EIM.

Overall monitoring associated with water quality and watershed health has increased from $20.2 million in 2002-03 to 21.4 million in 2005-07 or an increase of $1.25 million. Ecology has expanded the number of stream flow gauges and now operates stations in 11 of the 19 priority watersheds. In addition, there have been increased expenditures to measure TMDLs for polluted waterways.

Department of Natural Resources

No changes have been identified by the Department of Natural Resources. Their reported monitoring budget declined from $12.5 million in 2001-02 to $12 million in 2005-07. Reductions were mainly identified in Forest and Fish funding and may be a result of errors reported in the CMS.

Department of Fish and Wildlife

The monitoring funds identified for salmon recovery and watershed health have increased from $30.8 million in 2001-03 to $35.7 million in 2007-09 for an increase of $4.8 million. Changes in the amount of funding are directly related to the mass marking of hatchery salmon as provided through federal funding provisos.

The Department of Fish and Wildlife (WDFW) has made several recent changes to data storage and dissemination.

To increase public access to information, maps, and data, WDFW has added three online interactive mapping applications (*Go Hunt, SalmonScape, Marine Bird Density Atlas*) to their website. The following two applications have salmon recovery and conservation utility.

1. *SalmonScape* is an interactive mapping application designed to display and report a wide range of data related to salmon distribution, status, and habitats. The data sources used by SalmonScape include stream specific fish and habitat data, and information about stock status (i.e., SaSI data) and recovery evaluations.
2. *Marine Bird Density Atlas* provides detailed information regarding birds found on Puget Sound waters during WDFW winter and summer surveys. This interactive application includes density distribution maps that can be scaled to specific areas of interest for all bird species, species groups, and selected species. The application also provides a comprehensive look at status, trends, survey methods, and habitat use for these important Puget Sound resources.

To improve efficiency in data storage and reporting, the Salmonid Screening, Habitat Enhancement and Restoration (SSHEAR) data, and the Salmon and Steelhead Habitat Information and Assessment Project (SSHIAP) data have been integrated into a common, modern, and more user-friendly database (SSHIAP database). New database features include improved natural barrier features and the location of barriers that have been removed as a result of salmon recovery efforts.

WDFW received federal funding to oversee the development of a centralized, web-accessible system for lead entity salmon habitat work schedules. Habitat work schedules are prioritized lead entity salmon restoration and habitat projects. The purpose of this centralized system is to increase tracking, public viewing, and funding opportunities for lead entity potential salmon restoration projects. The Habitat Work

Schedule System will track potential (i.e., not yet funded) salmon habitat and restoration projects, and provide a searchable database with associated mapping (GIS) capabilities. The Habitat Work Schedule System will be a module linked with existing project database systems (e.g., IAC's PRISM, existing lead entity databases, and Watershed Data Pilot Project) so that potential salmon habitat projects can be easily viewed by the public. The Habitat Work Schedule System is scheduled to be online in the fall of 2007.

Conservation Commission

The Washington Conservation Commission (WCC) received $500,000 in legislative funding to conduct a pilot study – Watershed Data Pilot Project (WDPP). The pilot is exploring a single repository to track, manage, and report at the local, regional, and statewide basis all habitat projects developed by the conservation districts. It will allow WCC to communicate the full extent of conservation district efforts and will aid with the objectives of implementation and effectiveness monitoring as per the Monitoring Forum.

Interagency Committee for Outdoor Recreation

Incorporation of Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) partnership information into PRISM resulted in cost savings for the state and avoided creating a new database system.

The Salmon Recovery Funding Board (SRFB) funded four Intensively Monitored Watersheds (IMWs) in 2004 in coordination with other efforts by the Northwest Power and Conservation Council (NWPCC) in the Columbia River. ECY, WDFW, and the IMW Oversight Committee have currently developed IMW Projects in five locations and four Salmon Recovery Regions. These include ten streams in three small stream complexes (Hood Canal IMW [4 streams], Strait of Juan de Fuca IMW [3 streams], and Lower Columbia IMW [3 streams]) that are focused on coho, steelhead, and cutthroat monitoring; and two larger basins directed at Chinook monitoring (Skagit and Wenatchee). Baseline monitoring is occurring in all IMWs and restoration has begun in the watersheds. The IMWs are designed to answer the question most often asked by Congress and the Legislature; Are the millions of restoration dollars spent on habitat improvement projects actually creating more salmon?

The SRFB approved funding for reach scale effectiveness monitoring in October 2003, and a contract was awarded to Tetra Tech FW, Inc. in April to begin work in the spring of 2004 for selected 2004 (Round 4) and later projects. Reach scale effectiveness monitoring experimental design and sampling protocols were developed for fish passage, riparian plantings, instream structures, livestock exclusions, constrained channels, reconnected channels, gravel placement, and diversion screening restoration projects. The intent of the monitoring is to test whether habitat targeted for restoration has been improved, and which project types are most cost effective.

In 2006, the IAC has begun to upgrade PRISM architecture from its old Visual Basic 6 platform to .Net. PRISM is a geospatially referenced database capable of producing maps with project data points and some overlays such as major roads and streams.

In 2006, the IAC received funding from the Legislature to upgrade the GIS system to produce two-dimensional polygons as part of mapping capabilities. This will allow future delineation of property lines for habitat acquisitions and stream reaches where habitat restoration actions have taken place. Also, additional overlays are anticipated such as orthophoto.

Recommendations for Improving Monitoring

Statewide Salmon Abundance Monitoring For ESA Salmon De-Listing

The Salmon Monitoring Framework is a strategy outlined by the Governor's Forum on Monitoring to track salmon abundance and productivity and to relate changes in freshwater productivity to habitat conditions. NOAA-Fisheries and their associated Technical Review Teams (TRT) have identified 28 major population groups (MPG) and a minimum of 86 primary populations that may require monitoring to effectively assess delisting criteria statewide. The concept driving the Salmon Monitoring Framework is based upon their guidance. The strategy seeks to develop fish in and fish out specific information for selected primary populations and to tie this fish abundance information directly to habitat and water quality conditions in those watersheds and the overall Salmon Recovery Region (ESU).

The most immediate need in monitoring salmon abundance and productivity is to fill current data gaps in juvenile and adult monitoring, such that data on both juveniles and adults are being simultaneously and continuously collected for at least one primary population for each major population group (MPG) within an ESU for all listed salmon statewide. Primary populations are those that must demonstrate low risk of extinction in order to recover the MPG and ESU. Existing juvenile migrant trapping sites are insufficient in some portions of the state to evaluate listed salmon species. Until at least one juvenile trap site is available in conjunction with good salmon spawner abundance data for each MPG, it will not be possible to determine if the salmon populations are meeting de-listing criteria. WDFW has proposed an initial 34 juvenile monitoring sites (smolt traps and spawner surveys) that will monitor primary populations and begin to address data gaps for MPGs and should be strongly considered if the state is to demonstrate recovery. The proposal initiates the discussion at the local and regional scale to identify those primary populations that warrant monitoring. It does not propose to monitor all 86 primary populations.

Table 2. List of watersheds proposed for monitoring juvenile and adult salmon. Gaps are identified by shading

Salmon Recovery Region	Number of primary populations within the watershed	Targeted Primary Watersheds For Juvenile Trapping	Current Juvenile Trapping Status
Puget Sound	2	Nooksack	Yes Tribal
	6	Skagit	Yes Proposed SRFB Funding
	2	Stillaguamish	Yes Stillaguamish Tribe
	1	Skykomish	Yes Tulalip Tribe
	1	Snoqualmie	Yes Tulalip Tribe
	1	White	No
	1	Nisqually	No- State budget request
	1	Skokomish	No
	2	Dosewallips	No- State budget request
	1	Hamma Hamma	Yes USFWS funded
	1	Elwha	Yes Lower Elwha Tribe
	1	Dungeness	No- State budget request
Coast	1	Ozette	Yes Tribal
Lower Columbia	3	Grays	No- State budget request
	5	EF Lewis	No- State budget request
	2	Cedar Creek-NF Lewis	Yes Ongoing SRFB Funding
	4	Kalama	Yes WDFW Federal Funds
	3	Cowlitz	Yes Tacoma City Light
	3	Coweeman	No- NPCC Proposal
	4	Toutle	No
	1	Mill	Yes SRFB
	2	Wind	No- NPCC Proposal

	1	Duncan Creek	No -NPCC Proposal
Middle Columbia	1	Klickitat	Yes Tribal/BPA
	3	Yakima	Yes Tribal/BPA
	1	Touchet	No - State budget request
Upper Columbia	2	Wenatchee	Yes PUD-Fed
	2	Entiat	Yes USFWS
	2	Methow	Yes PUD
	1	Okanogan	Yes Tribal BPA
Snake	2	Tucannon	No -NPCC Proposal
	1	Walla Walla	Yes Umatilla Tribe
	2	Asotin	No -NPCC Proposal
	4	Grand Ronde	No -State budget request
Total	**70**	**34**	**15 traps need funding**

Habitat and Water Quality Status and Trend Monitoring

The Comprehensive Monitoring Strategy (CMS) recommended the implementation of a habitat status and trend monitoring system to detect changes in habitat, water quality and fish presence/absence at the WRIA scale. Subsequently, the SRFB and the Governor's Forum on Monitoring have both recognized that without this monitoring no true measure of restoration progress could be made. Simply measuring restoration actions does not take into consideration habitat degradation occurring elsewhere at the same time. The 2004 State of Salmon in Watersheds (SOS) utilized the Limiting Factors Assessment performed by the Conservation Commission in 2002. There are no new data available for the 2006 SOS and thereafter. The Department of Ecology has recently completed a framework for implementing this needed measurement on behalf of the FORUM and through a grant from the SRFB.

Close to $200 million dollars has been spent in federal and state funds to restore salmon habitat in Washington. Additional funds will be needed to implement habitat restoration and protection identified in recovery plans filed with the federal government. However, there is no existing habitat and water quality monitoring that can track the progress of salmon recovery and to determine the overall condition of the state's watersheds, and rivers, streams, and their associated riparian areas. The lack of habitat status and trend information jeopardizes future recovery efforts and funding opportunities because we are unable to determine where recovery actions are improving conditions and where they are not.

A collaborative effort between the Department of Fish and Wildlife (WDFW), Department of Ecology (Ecology), the Salmon Recovery Regions, the Interagency Committee for Outdoor Recreation (IAC), and a consortium of governmental, private and non-profit organizations led by the Regional Fisheries Enhancement Groups all support the development of a strong habitat and water quality status/trend program. The Department of Ecology has worked to build a local/state monitoring consortium with counties, cities, and others to integrate ongoing monitoring requirements for effluent discharges under the National Pollution Discharge Elimination System (NPDES), stormwater runoff monitoring requirements and Endangered Species Act (ESA) monitoring requirements into a coordinated approach that could reduce overall combined costs and improve overall coverage using probabilistic sampling. This proposal may also gain the support of the Association of Cities and many of the urban governments of the Puget Sound basin.

<u>Habitat Status and Trends – Remote Sensing</u>

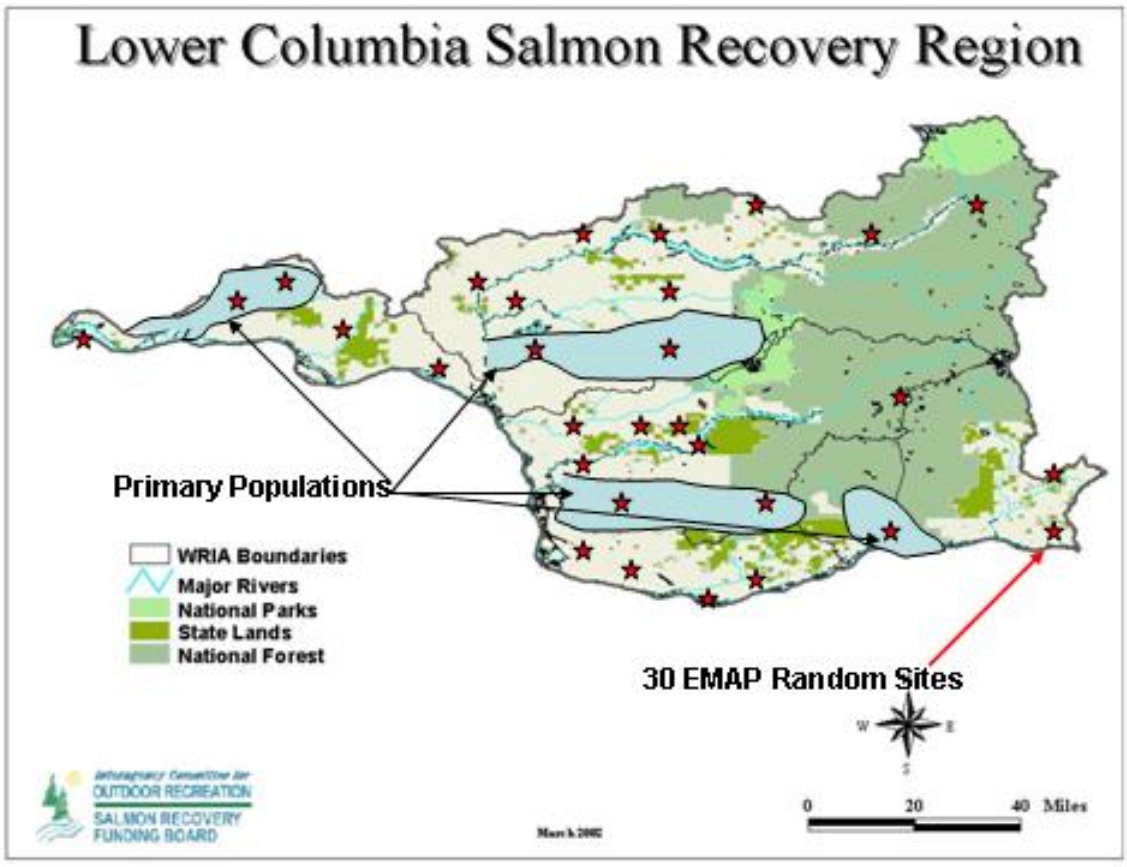
The WDFW would acquire high altitude satellite imagery to compare changes in land conversion, impervious surfaces, and floodplain area for each Salmon Recovery Region and ESA Major Population Group in the state. Aerial photos would be used to generate a total census of the status and trends in riparian vegetation type and cover, roads, stream crossings, and where possible river channel morphology and large woody debris for at least one listed primary salmon population per major population group in each recovery region. Aerial photography monitoring would be done where there are complimentary salmon productivity (i.e., fish in-fish out) data and where local groups want to do monitoring. Remote sensing data provides "big picture" metrics of land use changes and avoids intrusion

into private property. Remote sensing, however, cannot measure water quality, stream sedimentation and other parameters needed to quantify some aspects of watershed health. Therefore, a combination of remote sensing and on-the-ground probabilistic sampling is necessary.

Habitat and Water Quality Status and Trends – On-the-Ground Sampling

The Salmon Recovery Regions would collaborate with WDFW and Ecology to identify available local resources to conduct on-the-ground fieldwork. Partners may include local Regional Fisheries Enhancement Groups, conservation districts, municipalities, counties, private corporations, state agencies, and others having experience expertise and interest in participating in the monitoring activity. This EMAP sampling will provide approximately 60 randomly selected, representative sample points across 2 salmon recovery regions per year. The sampling would be conducted using the randomly selected sampling locations developed by the Department of Ecology for the Salmon Recovery Funding Board, and through the use of EMAP sampling protocols developed by the US Environmental Protection Agency. The Department of Ecology would ensure that quality control measures and training needs are met among the various participants. On-the-ground sampling would collect physical, chemical, and biological data that will enable the state to detect changes in water quality, changes in in-stream sedimentation, hiding cover, and stream structure essential to salmon, and changes in fish distribution and composition. In addition, changes to stream bank vegetation and structure will also be documented. These measures will serve to track the status and the trends not only in salmon habitat and water quality, but also in monitoring distribution of many invasive species and in addressing biodiversity along our rivers and streams.

Figure 1. Lower Columbia SRR example of the linkage between primary population watersheds where both fish-in fish-out and remote sensing will occur coupled with new random EMAP sites selected throughout the SRR annually.



The Department of Ecology has been working with municipalities and counties to develop a consortium to more efficiently address water quality issues. The idea is that by providing a ready infrastructure (including field methods, data formats, and training), we can then harness at least some portion of the resources currently devoted to local and project-scale monitoring and assure that those data can be rolled-up into a regional or statewide Status and Trends program. The local monitoring entities would gain the ability to view and understand their specific results against a context of regional and statewide conditions, and the state and regional agencies would be able to leverage some of the resources currently devoted to local and project-scale monitoring. To the extent that local entitites found the Status and Trends Framework infrastructure useful, those agencies could adopt potentially the basic program elements (e.g. field methods, data formats, quality assurance controls) for other portions of their monitoring programs, gaining additional efficiency and overall cost-savings. It provides a starting point to allow local cooperators to add supplemental data (through the Consortium process described above) to provide more refined local/regional assessments such as those required to support salmon recovery implementation by regional salmon recovery boards.

Using this approach to monitoring will:

- Complement the efforts already underway by the US Forest Service and Bureau of Land Management in using EMAP type sampling on federal forest lands and rangelands.
- Provide information to assist state and federal stakeholders prioritize where salmon recovery and restoration funds are used.
- Provide information to local stakeholder and restoration groups on the progress of habitat and water quality improvement actions.
- Compliment salmon population monitoring in key population groups by monitoring habitat limiting factors at the same time.
- Provide habitat information that will allow NOAA Fisheries to evaluate Washington's salmon recovery progress relative to the identified factors for decline.
- Provide information to help manage salmon fisheries. Facilitate integration of habitat monitoring with harvest and hatcheries (H-integration) to accelerate successful recovery.
- Maximize the scope of habitat and water quality data that can be procured with limited resources.
- Maximize the effect of limited restoration resources by linking habitat and water quality monitoring to fish population data in priority sub basins and watersheds.
- Improve efficiency and increase coordination of existing initiatives: The State Biodiversity Initiative, the Landscape-level Wildlife Assessment under development by the Washington State Forest Practice Board, and the Interagency Vegetation Mapping Project sponsored by the US Forest Service may all contribute to and utilize this monitoring.

It is recommended that the OFM and Legislature assist with the funding of this needed monitoring.

Recommendations for Improving Data Management

Create a Consolidated GIS River and Stream Layer for State Government

Currently, the State of Washington does not have one source for river and stream GIS data. There are, in fact, three different sets being used to make regulatory decisions. This means inconsistent data and conflicting decisions are reached on cross-agency natural resource/environmental permits. This proposal would produce a consolidated WDFW, DNR, and Ecology regulatory data set (stream typing, water quality, fish habitat). This would be managed and maintained by Ecology with changes and updates made by all three agencies in one place. This proposal will affect municipal, county, and other entities relying upon accurate river and stream maps.

Create Enterprise Architecture Grant Management Unit for Natural Resource Agencies

The Office of Financial Management (OFM) has created a Washington State Roadmap of Business Initiatives. According to its publication, "It is a collaborative multiyear program for the incremental transformation of Washington State financial and administrative policies, processes, and information systems. The intent is to solve today's common business problems with enterprise best practices and tools. The goals of the Roadmap are: streamline financial and administrative processes; leverage the state's investments in systems and data tools to reduce costs and achieve economies of scale; and improve core management systems to align with performance management directions, provide valuable management information, and assure accountability."

Among the Roadmap agendas was to create an enterprise grant/project accounting system. This was proposed for FY 2010 but was initiated in 2006. The natural resource agencies have been involved in discussions with OFM's Accounting Division as they proceed.

Currently, the Department of Ecology has been prohibited from updating their grant management program for water-associated grants until the new Roadmap is completed. In addition, IAC's PRISM was allowed to proceed with updating from VB-6 framework to .Net, but with strict requirements that no changes to financial tracking of grants can be completed until the Roadmap is completed. At the same time, the Conservation Commission has been provided with $500,000 to complete a pilot project that explores a single repository to track, manage, and report at the local, regional, and statewide basis all habitat projects developed by the conservation districts, and the Department of Fish and Wildlife has received $700,000 in a federal grant to create a proposed tracking system for lead entities. In the meantime, PRISM has accommodated the needs of the Puget Sound Nearshore Partnership for managing potential restoration projects in the marine environment.

All of the natural resource agencies also have performance metric reporting requirements to federal grantees such as the National Marine Fisheries Service, Environmental Protection Agency, Natural Resource Conservation Service, U.S. Fish and Wildlife Service and others. In turn, the state's natural resource agencies either already collect, or will in the near future, collect and report output and outcome metrics from grant recipients at the local level. These requirements go beyond the intent and ability of the Roadmap.

Therefore, it is recommended that a specific Roadmap Unit for natural resources be created that will contain the necessary financial and project grant information needed by the Roadmap but will also contain the needed metrics and reporting requirements needed by the natural resource agencies. This will allow for greater coordination of natural resource information and will provide the natural resource agencies with the flexibility needed to update and alter reporting metrics, outputs, and outcomes over time.

Natural Resource Agencies Should Continue to Consolidate Internal Databases

The Department of Ecology has taken tremendous strides in consolidating internal databases into their EIM system. The IAC has only one database, the PRISM system. Appendix 1 illustrates the possibilities for consolidation of WDFW databases given adequate funding. It is recommended that the natural resource agencies continue to consolidate their internal databases through developing a well-planned strategy that would be compatible with the Enterprise Architecture Roadmap.

Improve the Natural Resource Data Portal

The IAC, on behalf of the Salmon and Watershed Information Management Technical Advisory Committee (SWIMTAC), has submitted proposals in the 2003-05 and 2005-07 biennia for funding an enhancement to the natural resources data portal to allow data to be drawn from multiple agencies in real time for interactive reporting of data pertinent to salmon recovery and watershed health. These requests have failed to be included in the OFM budget request to the Legislature. If natural resource information is to be truly available to the public and decision makers, this is an important step in that direction. It is recommended that the SWIM data portal be improved with a pilot project using one area of the state to demonstrate how distributed databases within WDFW, ECY, WCC, IAC, and DNR can be combined without creating a central repository.

Recommendations for Eliminating Monitoring

The agencies reviewed current monitoring for possible duplicate efforts and for programs no longer needed. The following table is an attempt to illustrate the responsibilities of state agencies for collecting specific kinds of information and where similarities may occur. It also attempts to show what management questions are being answered and whether the monitoring is supported by statute. As can be observed from the table, nearly all ongoing monitoring is specific for natural resource information associated with agency mandates. Taken as a whole there are no major overlaps in monitoring programs, however, data may be able to be collected more efficiently if coordinated more closely between the state agencies. The Forum did not have a basis for knowing whether any of these monitoring programs should be eliminated without further detailed study.

Table 3. Comparison of state monitoring activities and the management questions being answered through the monitoring activity.

Ongoing Monitoring Program	AGENCY	Required By Statute	Comments	Question Answered	Eliminate?
Stream flow monitoring	ECY	RCW 90.48.260	Shares stream flow monitoring with the USGS	What is the daily, monthly and annual flow of selected streams?	No
Well Log Imaging	ECY	RCW 18.104.050 requires a well report	Provides information about well locations and status	What is the status of well water levels?	No
Water Withdrawal Compliance	ECY	RCW 43.05.060 90.22.050	Makes sure that water is not over appropriated	Are holders of water rights complying with water right?	No
Setting Instream Flows	ECY-WDFW		Crucial for setting allowable withdrawals from rivers and streams	What is the minimum flow needed to maintain biological stream integrity?	No
Walla Walla Stream Flow	ECY-WDFW	No	Short term in basin flow compliance check	What is the status of stream flow and withdrawals in the Walla Walla River?	No
Ambient water quality monitoring	ECY	RCW 90.48.260 Clean Water Act	Long term non-random sites. Used to support federal NPDES program and TMDL actions.	What is the status of water quality at selected sites scattered across the state?	No
West Coast EMAP monitoring	ECY	No	Program ended	What is the status of Washington marine environment relative to other parts of the nation?	Yes
Marine waters water quality monitoring	ECY	Yes federal Clean Water Act	Mission critical	What is the status of water quality in Puget Sound and coastal marine waters?	No
Marine sediment monitoring	ECY	Yes federal Clean Water Act	Mission critical	What is the status of toxics, marine invertebrates and sediments in the marine areas?	No
Impaired Waters Compliance	ECY	Yes federal Clean Water Act	Identifies waters not in compliance	Where are there waters of the state not complying with the federal Clean Water Act?	No
Toxic Pollution Studies	ECY-DOH	RCW 90.48.260 Clean Water Act	Monitors toxics in freshwater and fish tissues	What is the status of toxins such as PCBs in freshwater lakes and streams and in fish tissue?	No
Total Maximum Daily Load Studies	ECY	Yes federal Clean Water Act	Used to measure pollutant load reductions near pollution sources	Have pollution load levels been reduced in areas identified as impaired?	No
Beach Environmental Assessment	ECY-DOH	EPA BEACH Act	Monitors bacteria at saltwater swimming beaches for DOH	What is the status of harmful bacteria at saltwater swimming beaches?	No
Stream Biological	ECY	No	Stream reference sites for	What are the status/trends of biological	No

Ongoing Monitoring Program	AGENCY	Required By Statute	Comments	Question Answered	Eliminate?
Monitoring			comparing impaired waters	communities at selected statewide reference sites with ideal habitat conditions?	
TFW Cooperative monitoring (CMER)	DNR-WDFW-ECY	RCW 76.09.370 Forest-Fish Settlement	Testing the effectiveness of TFW prescriptions	What is the effectiveness of Forest-Fish forest practice rule changes in improving fish habitat?	No
Natural Heritage Monitoring	DNR	RCW 79.70.030	Inventory of state's significant ecological features	Where are the natural areas of the state located and what are their attributes?	No
Kings Lake Bog Water Quality Study	DNR	No	Tracks changes in bog chemistry and hydrology	What is the status/trend of water chemistry and hydrology at Kings Lake bog?	No
HCP Compliance Monitoring	DNR	Federal HCP	Monitors compliance with HCP requirements	Are state and private forest land practices in compliance with the HCP requirements?	No
HCP Roads Improvement Monitoring	DNR	Federal HCP	Inventories DNR forest roads and fish barriers	Where are there fish passage barriers on DNR forest roads?	No
Puget Sound Nearshore Monitoring	DNR	No	Tracks information about intertidal biotic communities such as kelp and eelgrass.	What are the status/trends of the biological communities of the nearshore marine areas of Puget Sound?	No
Dredge site monitoring	DNR		Maintains an inventory of dredge spoil site in Puget Sound and the coast.	Where are the dredge spoil sites in Washington? What is the impact of those sites on local environment?	No
Adult salmon spawner abundance	DFW	US v Washington US v Oregon	Maintains annual estimates of spawner abundance by river and species for selected populations	What is the annual abundance of spawning adult salmon by water and by species? What are the trends?	No
Counting Juvenile salmon migrating to the sea	DFW	US v Washington US v Oregon	Maintains annual estimated of the abundance of juvenile salmon migrating to the sea from specific selected streams	What is the freshwater production of salmon for selected streams and species by year? What is the population's productivity?	No
Puget Sound Harvest Monitoring	DFW	US v Washington	Tracks catch allocations between Puget Sound treaty tribes and commercial and sport non-Indian fisheries	What is the overall harvest of Puget Sound salmon by species and by river? How is the allocation split between treaty tribes and non-Indians?	No
Ocean Harvest Monitoring	DFW	US v Washington US v Oregon and Magnuson Act	Tracks catch allocations between coastal ocean fisheries set by the PFMC for treaty tribes and commercial and sport non-Indian fisheries	What is the overall harvest of salmon in Ocean areas 1-4 by species? How is the allocation split between treaty tribes and non-Indians? Has the allowable quota been met?	No
Columbia River Harvest Monitoring	DFW	US v Oregon	Tracks catch allocations between Columbia River treaty tribes and commercial and sport non-Indian fisheries	What is the overall harvest of salmon in the Columbia River by species? How is the allocation split between treaty tribes and non-Indians? Has the allowable quota been met?	No
Sport Harvest catch	DFW	US v	Tracks sport catch in the smaller	What is the sport catch of salmon in the state and	No

Ongoing Monitoring Program	AGENCY	Required By Statute	Comments	Question Answered	Eliminate?
Record card		Washington US v Oregon	rivers and streams of the state	by river and ocean area?	
Hatchery marking and coded wire tag Program	DFW	Pacific Salmon Treaty RCW 77.95..280	Marks hatchery released salmon with a special tag allowing identification in harvest fisheries throughout the Pacific Ocean	Where are Washington hatchery salmon being caught? What is the relative proportion of the catch in each Pacific coastal fishery?	No
Stock Identification and Genetics Program	DFW	No	Uses DNA analysis to identify specific wild salmon populations. Identifies linkages between populations to determine unique populations	Where is the major wild population groups of salmon located? What fisheries are intercepting Washington wild salmon?	No
Stock ID and Fish Age Structure Program	DFW	No	Uses fish body parts to determine age structure, growth and survival	What is the cohort reconstruction of each salmon run? What effect did ocean environmental conditions have on growth and survival?	No
Invasive species monitoring	DFW	RCW 77.60.110 specific to zebra mussels and green crab	Tracks occurrence and movement of aquatic and terrestrial invasive animal species such as green crab	What is the status of invasive animal species distribution in Washington? What are the trends?	No
Marine video acoustics Surveys	DFW	No	Tracks rockfish populations and other species associated with marine rocky reefs.	What is the status/trend of rockfish, lingcod, and other fishes on rocky reef habitat of Puget Sound?	No
Hydraulic Permit Compliance Monitoring	DFW	RCW 77.55	Determines whether applicants who receive a hydraulic permit to work in a river or stream complied with their permit	What is the compliance rate of those who obtained permits to perform work within the high water mark of any lake river or stream?	No
Puget Sound Herring Stock Assessments	DFW	No	Critical for determining annual abundance of herring in Puget Sound. Herring are the basic food source for salmon, seals, rockfish, and many other species	What is the status/trend of the various herring populations residing within the Puget Sound?	No
Puget Sound ambient monitoring program for salmon	DFW	No	Monitors trends in fish health at specific locations throughout the Puget Sound for toxics affecting human health	What is the status/trend of PCBs and other toxics in fish tissue?	No
Puget Sound ambient monitoring program for birds	DFW	No	Monitors trends in distribution and abundance of marine birds, mammals in Puget Sound	What are the status/trends in marine birds and mammals in Puget Sound?	No
Puget Sound bottom trawl monitoring	DFW		Estimates population of bottomfish and invertebrates within the various basins	What are the status/trends in marine bottomfish and invertebrates for specific basins of Puget Sound?	No
Hydropower	DFW	No	Monitors effectiveness of mitigation	What is the effectiveness of mitigation actions by	No

Ongoing Monitoring Program	AGENCY	Required By Statute	Comments	Question Answered	Eliminate?
effectiveness monitoring			actions at various hydropower installations in meeting FERC license requirements	each project?	
Limiting Factors Analysis	WCC	Yes	Provided initial assessment of factors limiting salmon production by watershed	What are the salmon limiting factors by WRIA for the state?	Yes. Program ended in 2005
Intensively monitored watersheds	IAC-WDFW-ECY	No	Intensively monitors salmon populations and habitat restoration actions to show that more salmon are produced as a result of restoration actions.	Do habitat restoration actions cause a positive response in overall fish production in selected watersheds?	No
Project scale effectiveness monitoring	IAC	No	Measures changes in habitat at the project scale at restoration projects and compares them to a control area.	What categories of restoration actions are most effective? Are most cost effective? Have the greatest longevity?	No
Restoration project Implementation/ compliance monitoring	IAC	No	Tracks projects to insure that they are completed according to plan and specifications	Are the projects implemented as approved? Are funds expended in a timely manner?	No

The following table for databases compares the locations and importance of the system. The database table reveals for those highly decentralized agencies such as WDFW and DNR, consolidation of regional databases into statewide databases would be very useful in providing greater availability of data to the public and government. It would force standardization and would create greater confidence in agency science. Many databases are running on a single PC assigned to a biologist or other staff. These data are at risk. Greatest single comment by the database stewards called for web accessibility.

Database Name		Location	Architecture	Other database involved	How important is this database?
Smolt monitoring	WDFW	WDFW Olympia servers and PCs	dBase	This database covers WDFW projects in Puget Sound, the Washington Coast, and selected Columbia River sites. Separate databases are maintained by WDFW regional staff, tribes, USFWS, and ODFW for other smolt monitoring projects occurring in Washington.	Converted to run in a Windows compatible environment.
Adult trapping	WDFW	Individual biologist's PCs	Spreadsheets	This database covers WDFW projects in Puget Sound, the Washington Coast, and selected Columbia River sites. Separate databases are maintained by WDFW regional staff and Habitat Program staff.	The database should be centralized and converted to run in a Windows compatible environment.
Salmonid Spawning Ground Survey	WDFW	WDFW Headquarters, NRB, Olympia, WA. Main repository exists in SQL Server; derivative (working) copies are maintained in MS Access on network drives and data steward's computer.	MS Access database	No	Should create website interface for data entry and to provide public access to data and reports. Should modify PDA program used to collect survey data in the field to synchronize directly with the SQL Server database.
Age database	WDFW	WDFW Headquarters, NRB, Olympia, WA. Main repository exists in MS Access on the data steward's computer	MS Access database	No	Should create website interface for data entry and to provide public access to data and reports.
Otolith database	WDFW	Otolith Lab personal computer at NRB	Excel files; MS Access tables	NPAFC contains thermal mark information for USA, Japan, Korea, Russia and Canada	Migration to Access needs to be completed; report functionality needs to be added; query capabilities expanded; unique fish identifier needs to be pursued to facilitate linkage with other biological sampling or

Database Name		Location	Architecture	Other database involved	How important is this database?
					tagging datasets
Genetics Lab database	WDFW	WDFW network computer at NRB	Sybase with a Java language front-end.	No	Needs to be completed. Other enhancements include a more sophisticated query procedure, and adaptation to include individual sample (versus collection) data, such as genotypes.
Hatchery production planning	WDFW	One PC (Micron, Windows 1998)	Paradox for DOS	No	Accessibility to users, streamlined data entry, improved architecture, integrate or ability to compare with plants, provide management objective, mark/tag planning information
CWT Recovery database	WDFW	WDFW Sun server Olympia NRB	Sybase database	No	Increased user accessibility would be useful where other coastwide (non WA) recoveries were not targeted.
Spawn and egg take database	WDFW	Shared Drive T:/HatDB_Dev at NRB	MS Access database.	No	Accessibility to users, streamlined data entry, improved architecture, ability to accurately track Natural Origin Recruits (NOR's) and Hatchery Origin Recruits (HOR's)
Hatchery returns	WDFW	Shared Drive T:/HatDB_Dev at NRB	MS Access database	No	Accessibility to users, streamlined data entry, improved architecture
Sport CRC	WDFW	Personal computer of CRC Project Manager.	SAS datasets, MS Access	None, unless they are derivatives of this database	Increased public access to harvest estimates summaries
LIFT commercial fish tickets	WDFW	WDFW Olympia Headquarters	Sybase database	No	Needs to be moved from Sybase to SQL Server. New functionality required for Enforcement staff. Need to establish web data reports for public and other research staff. Need to explore electronic data capture at the time catch is landed.
Hatchery returns	WDFW	Shared Drive T:/HatDB_Dev at	MS Access database	No	Accessibility to users, streamlined data entry,

Database Name		Location	Architecture	Other database involved	How important is this database?
		NRB			improved architecture
Hatchery release	WDFW	Shared Drive T:/HatDB_Dev at NRB	MS Access database	PSMFC- rolled-out release information	Accessibility to users, streamlined data entry, improved architecture
PSAMPFC	WDFW				
PSAMP Birds	WDFW				
FPDSI, (formerly SSHEARbase)	WDFW	Olympia, NRB, Habitat Program, Science Division	MS SQL Server	Local governments may have redundant information in their datasets for their geographic areas. The FPDSI is the most extensive database for fish passage barriers in Washington.	
Salmon and Steelhead Habitat Inventory and Assessment Program	WDFW	Olympia, NRB, Habitat Program, Science Division	GIS, Personal Geodatabase	SSHIAP is shared with the Northwest Indian Fisheries Commission, which has a similar database for Puget Sound and coastal WRIAs 1-23.	LiDAR would improve the accuracy of the state's hydrography layer on which all SSHIAP attributes are appended; including fish distribution, and barrier data. More rapid conversion of the state's hydrography data to match federal standards (NHD) would improve the transferability of SSHIAP data to regional interests. Improved natural barrier data could make model predictions of fish habitat more precise. Impervious surface attributes and hydro modifications (dams, levees, bank armoring) could be added to SSHIAP with greater statewide access to more frequently with the availability of high resolution digital orthophotos.
HPA Database	WDFW	Olympia, NRB, Habitat Program	MS SQL Server 2000	No	
Forage fish database	WDFW	Olympia, NRB, Habitat Program, Science Division	GIS coverage migrating to a Personal	Some counties and tribes have limited forage fish information.	Enhancements to the survey efforts will improve the database.

Database Name		Location	Architecture	Other database involved	How important is this database?
			Geodatabase as of 3/06. The parent database is MS Access.		
Freshwater ambient database	ECY	Ecology server, Lacey	MS Access	Yes EIM has data uploaded from this database	High Primary point to access statewide water quality information
Marine waters database	ECY	Data not provided	Data not provided	Data not provided	Data not provided
Marine sediments database (SEDQUAL)	ECY	Data not provided	Data not provided	Data not provided	Data not provided
Toxic pollution studies database	ECY	Combined with EIM database	Combined with EIM database	Combined with EIM database	Combined with EIM database
TMDL studies database	ECY	Combined with EIM database	Combined with EIM database	Combined with EIM database	Combined with EIM database
Non-point pollution database	ECY	Combined with EIM database	Combined with EIM database	Combined with EIM database	Combined with EIM database
EIM Database	ECY	Lacey Office	Web interface SQL Server	Yes. Sedqual, ambient database, LMS, and others are sources that supply data to EIM but are also separately maintained (SEDQUAL will be discontinued after it is fully migrated to EIM)	This is a mission critical database. It is the central repository for ECY environmental data
Hydrography database	ECY	Lacey Office	GIS overlay	Yes, Both DNR and WDFW have hydrography layers but with different data entries	This database should be combined with the stream hydrography layers developed by DFW and DNR.
Hazard zone landslide database	DNR	NRB Olympia Forest Practices Division	GIS coverages	No	Important for foresters and office staff who classify forest practice applications
Natural Heritage Information database	DNR	NRB Natural Heritage Program	Oracle database	Yes	Critical for implementing RCW 79.70. Critical for DNR to meet SFI certification
Hydrography database	DNR	NRB Olympia- DNR mainframe	Arc Info	Yes, Both ECY and WDFW have hydrography layers but with different data entries	High
Transportation database	DNR	NRB Olympia- DNR mainframe	Arc Info	No	High
Floating kelp	DNR	NRB Olympia DNR	ArcGis shape	No	High Data provides information

Database Name		Location	Architecture	Other database involved	How important is this database?
inventories database		Aquatic Resources Division	files		on a resource that is known to be ecologically important. DNR is mandated to protect kelp.
Intertidal biotic communities database	DNR	NRB Olympia DNR Aquatic Resources Division	ArcGis shape files	No	High Data provides information on the environmental health of Puget Sound shorelines. Data supports PSAT
Skagit-Whatcom intertidal habitat inventory database	DNR	NRB Olympia DNR Aquatic Resources Division	ArcGis shape files	No	Medium Data provides information on Puget sound habitat. Value is decreased because it is no longer current having ended in 1997
Eelgrass monitoring database	DNR	NRB Olympia DNR Aquatic Resources Division	MS Access database and ArcGis shape files	No	Mission critical- Provides information on a resource that is known to be ecologically important and is protected in statute. Supports PSAT
Washington shore zone inventory database	DNR	NRB Olympia DNR Aquatic Resources Division	ArcGis shape files	No	Mission critical- data provides information about Puget Sound shoreline characteristics. Used extensively for shoreline planning. Data collected since 2001. Supports PSAT
Aquatic land encumbrance database	DNR	NRB Olympia DNR Aquatic Resources Division	ArcGis shape files	Yes Some of the data is in a non-spatial format and is available through DNR NaturE data system uses for tracking leasing activity and revenue. Some data is also maintained on the paper maps maintained by the DNR title office	Mission critical—This data system will eventually replace a paper data management system that DNR is required to maintain regarding uses of state owned aquatic lands RCW 79.125.040
Dredged material management database	DNR	Data not provided	Data not provided	No	Data not provided
Lakes of Washington database	DNR	NRB Olympia DNR Aquatic Resources Division	ArcGis shape files	No	Medium data provides a critical context for management of lake ecosystems
Limiting factors database	WCC	Lacey Office of Northwest Indian Fisheries Commission	SSHIAP Arc GIS files	Yes. Database developed from existing files for each WRIA based upon Excel spreadsheets and databases	Program ended in 2003. data are still accessed periodically
CREP database	WCCD	Whatcom Conservation District Lyndon, WA	MS Access database	No	High—Tracks CREP projects and provides information for reports to state and federal

Database Name		Location	Architecture	Other database involved	How important is this database?
					interested parties
Watershed data pilot project	WCC	Not yet determined	Not yet determined	PRISM will contain the implementation monitoring information portion of projects funded by SRFB	High- It will allow WCC to communicate the full extent of conservation district efforts
PRISM	IAC	NRB Olympia, IAC	SQL Server .NET	Yes. PRISM hosts Puget Sound Nearshore Project database.	Mission critical- Provides all grant information, monitoring metrics, and GIS information for IAC, SRFB, grants

Current Monitoring Programs by Agency

Washington is blessed with having some of the most outstanding scenic beauty and rich natural resources of any state in the nation. We have nine recognized ecoregions, each with their own particular mix of geological features, climate, and associated native plants and animals. Each part of the state is impacted by our actions, both work and play.

Figure 2. Washington Ecoregions

The DNR, WDFW, ECY, IAC, and WCC all contribute parts of a research, monitoring, and evaluation (RME) structure for the natural resources of Washington. Without monitoring, it is not possible to have a clear understanding whether our natural resources are being preserved and maintained. The following discussion will treat the specific areas of our natural resources by the general areas of water, land, and aquatic biota.

Department of Ecology

Water is crucial to the long-term viability of our state's economy and also to the long-term viability of salmon and other aquatic species. The struggle for more water for urban growth and the struggle to maintain diminishing salmon populations is the question before us in the Puget Trough. Not only is quantity of water crucial, but also quality of water. Ever-increasing use of water, chemicals, and urban and agricultural runoff has created serious water quality issues for the future of clean water. It is, therefore, crucial to monitor water quantity and quality status and the trends and to determine if our management actions have been effective in addressing threats to clean water.

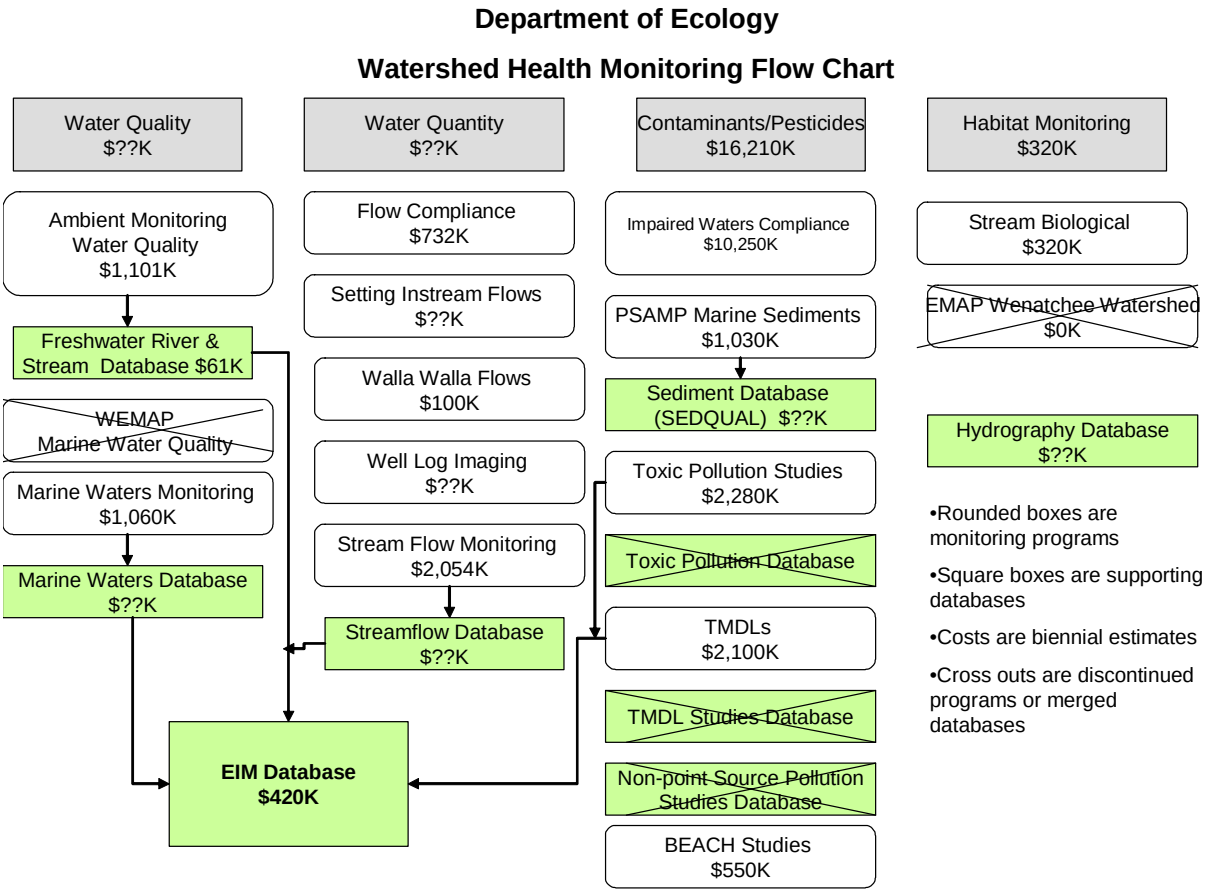


Figure 3. Department of Ecology Monitoring and Database Programs

Water Quantity

The Department of Ecology is charged with managing the state's surface waters. The existing streamflow monitoring program operates a series of stream gauging stations across the state. The MOC identified streamflow measures as a significant gap and recommended (#17) that the state: Increase the number of rivers and streams where continuous flow is measured. Watershed planning strategies depend upon adequate measurement of streamflow. To avoid future listings under the federal Endangered Species Act (ESA) and to reduce conflicts with water users, measuring flow is a necessity. Flow gauging stations provide continuous status information and can provide trend information in 3-5 years.

Surface Waters

Stream flow monitoring supports core business functions including setting instream flows, managing water resources, and measuring effectiveness of water resource management programs. Stream flow monitoring measures stream flow in fresh water rivers and streams in the State of Washington. Measure and evaluate seasonal and long-term (inter-annual) temporal patterns in stream flow for salmon recovery and watershed planning purposes; compare actual stream flows to in-stream flow targets; provide near real-time stream flow data via the Web to improve knowledge of stream flows and facilitate near real-time decision making in regard to stream flow management; support Total Maximum Daily Load (TMDL) development and implementation, and provide data to inform water quality assessments including determination of water quality violations.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Streamflow Monitoring	Status/trend	CMS Data not collected	CMS Data not collected	$2,100K
05-07	Streamflow Monitoring	Status/trend	$1,051K GFS $842K WQA	$161K GFF	$2,054K
	Program Change				**($46K)**

Ground Water

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Well Log Imaging	Database	CMS Data not collected	CMS Data not collected	CMS Data not collected
05-07	Well Log Imaging	Database	$100K		$100K
	Program Change				**$100K**

Permit Compliance

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Flow compliance	Compliance	CMS Data not collected	CMS Data not collected	$632K
05-07	Flow compliance	Compliance	Data not provided	Data not provided	Data not provided
	Program Change				**Unknown**

Setting Instream Flows

The MOC recommended (#7) that more funding should be used to:

> *Establish instream flow studies for the state's watersheds identified as water critical. Without determining benchmarks for water use, the State will continue to over-allocate water to the detriment of fish and wildlife populations and future beneficial human uses.*

Ecology's Work Plan for Instream Flow Setting through 2010 describes how Ecology and Fish & Wildlife will address statewide instream flow setting through 2010. Work is proceeding – Report to the Legislature at: http://www.ecy.wa.gov/biblio/0411001.html

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Setting Instream Flows	Baseline	CMS Data not collected	CMS Data not collected	$132K
05-07	Instream Flow Monitoring	Baseline	Data not provided	Data not provided	Data not provided
	Program Change				**Unknown**

Walla Walla Stream flow Monitoring

Working with WDFW to monitor low-flow streamflow conditions at nine sites within the Walla Walla Watershed. Provides baseline data to determine if trust water is being protected within the watershed.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Walla Walla Streamflow Monitoring	Compliance	CMS Data not collected	CMS Data not collected	CMS Data not collected
05-07	Walla Walla Streamflow Monitoring	Compliance	$100K GFS		$100K
	Program Change				**$100K**

Water Quality

Maintaining good water quality is important to all Washington residents and is also a federal requirement under the Clean Water Act.

Ambient Monitoring

The ambient monitoring program measures trend information in water quality at a number of fixed stations distributed non-randomly across the state. The program cannot provide accurate water quality status because the stations are not random and there are insufficient sites.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Long term freshwater river ambient monitoring	Trend	CMS Data not collected	CMS Data not collected	$2,270K
01-03	Ambient monitoring database	Database	CMS Data not collected	CMS Data not collected	$61K
	Total				$2,331K

05-07	Long term freshwater river ambient monitoring	Trend	$523K GFS $80K WQPF	$498K Fed	$1,101K
05-07	Ambient monitoring database	Database	$61K GFS	$0	$61K
	Total		$664K	$498K	$1,162K
	Program Change				**(1,169K)**

EMAP West Coast Monitoring (WEMAP)

The coastal component of the USEPA Western Environmental Monitoring and Assessment Program (EMAP) applies EMAP monitoring to marine coastal areas of Washington. Measures water column quality, sediment, benthic organisms, and data from fish trawls to describe current estuarine conditions. Program not funded in 2006.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	WEMAP	Status/trend	CMS Data not collected	CMS Data not collected	Not provided
05-07	WEMAP	Status/trend	No longer funded	No longer funded	No longer funded
	Program Change				**(Unknown)**

Marine Waters Monitoring – Water Quality

Mission critical – supports EPA mandate to monitor Washington State's marine waters and provides data for development of 303d list and 305b report. Only source of data for assessing effectiveness of management decisions in many marine areas. Critical for assessing the effects of human impacts and climate change on Washington's marine waters.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Marine Waters Monitoring	Trend	CMS Data not collected	CMS Data not collected	Not provided
05-07	Marine Waters Monitoring	Trend	$877K GFS	$183K GFF	$1,060K
	Program Change				**(Unknown)**

Contaminants and Pesticides

This section of the Department of Ecology monitors the presence of contaminating chemicals and pesticides in the environment to ensure that their levels do not exceed limits set by the federal government as hazardous to the health of humans, fish, and other organisms covered under the Clean Water Act.

Marine Sediment Monitoring Program

Assesses the current status and long term trends in the quality of marine sediments in Puget Sound. It develops baseline information for the chemistry, toxicity levels, and invertebrate diversity in Puget Sound sediments. Data are used for developing Clean Water Act reports to the EPA. Monitoring program is considered mission critical for supporting EPA mandates to Washington State's marine waters.

Marine Sediment Quality Information System (SEDQUAL)

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Marine Sediment Monitoring	Trend	CMS Data not collected	CMS Data not collected	$800K
05-07	Marine Sediment Monitoring	Trend	$430K GFS $418K STA	$182K GFF	$1,030K
05-07	Sediment Quality Information System (SedQual)	Database	Data not provided	Data not provided	Data not provided
	Program Change				**$230K**

Impaired Waters Compliance Monitoring

Every two years the Department of Ecology compiles a list of impaired waters that do not meet the Clean Water Act standards. Sample site selection is based on a five year statewide rotating schedule. The monitoring is designed to answer the question: "What is the status and trend of impaired waters that do not meet the Clean Water Act standards?"

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Impaired Waters Compliance	Status/Trend	CMS Data not collected	CMS Data not collected	$9,600K
05-07	Impaired Waters Compliance	Status/Trend	Data not provided	Data not provided	$10,250K
	Program Change				**$650K**

Toxic Pollution Studies

Monitors and assesses water, sediment, soil, and fish and shellfish tissue statewide to determine toxic pollution burdens. Monitors source and environmental fate of toxicants released into the environment. From this information, management strategies are recommended for toxic pollution control. This monitoring is considered mission critical because it is the only monitoring program the state has for toxic pollutants in freshwater. The Washington Department of Health uses this information for assessing human health consumption risks for toxics in edible fish tissue and is the primary source for issuing fish consumption advisories in Washington State.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Toxic Pollution Studies	Status/Trend	CMS Data not collected	CMS Data not collected	$0
05-07	Toxic Pollution Studies	Status/Trend	$305K GFS $605K STA $699K WQPF	$671K GFF	$2,280K
05-07	Toxic Pollution Studies Database	Database			Database consolidated into EIM System
	Program Change				**Unknown**

Total Maximum Daily Load Studies (TMDL)

Monitors and assesses state surface waters to determine pollutant load reductions needed to achieve compliance with state water quality standards. Monitors pollutant loading and fate in impaired waters. Estimates assimilative capacity of receiving waters for pollutant loading. Used to determine recommendations for pollutant reductions needed to achieve water quality standards. Considered mission critical because it is the only TMDL monitoring program the state has for conventional pollutants.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	TMDL Studies	Effectiveness	CMS Data not collected	CMS Data not collected	$580K
05-07	TMDL Studies	Effectiveness	GFS STA WQPF Data not provided	GFF Data not provided	$2,100K
05-07	TMDL Studies Database	Database	Database consolidated into EIM System	Database consolidated into EIM System	Database consolidated into EIM System
05-07	Non-point Pollution Studies Database	Database	Database consolidated into EIM System	Database consolidated into EIM System	Database consolidated into EIM System
	Program Change				**$1,520K**

Beach Environmental Assessment, Communication, And Health (BEACH) Program

This program monitors saltwater swimming beach waters for bacteria that indicate the possibility of pollution from sewage treatment plant problems, boating waste, and other sources. This monitoring program is low priority for ECY but is a high priority for the Department of Health, which is a partner in the program.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	BEACH Program	Status/Trend	Not in existence	Not in existence	$0
05-07	BEACH Program	Status/Trend	$0	$550K USEPA	$550K
	Program Change				**$550K**

Habitat Monitoring

Monitoring of habitat is shared by all of the participants in this report. The Department of Ecology has been monitoring habitat and other water characteristics through its Stream Biological Monitoring Program and through its participation with USEPA in EMAP evaluations.

Stream Biological Monitoring

Monitors trends of biological, chemical, and physical indictors in stream locations within each Washington ecoregion. Sites are established reference sites. It answers the question: “What is the status of biological, chemical, and physical indicators in stream locations of representative sites within each

ecoregion? Monitoring is considered of high importance in identifying biological community impairments for 303(d) listing and for evaluating effectiveness of habitat improvement plans.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Stream Biological Monitoring Program	Status/Trend	CMS Data not collected	CMS Data not collected	Unknown
05-07	Stream Biological Monitoring Program	Status/Trend	$70K GFS	$250K GFF	$320K
	Program Change				(Unknown)

Environmental Information Management Database (EIM)

EIM is the primary data repository for managing environmental monitoring data. This system stores physical, chemical, and biological monitoring data, including geographic location of the station where a sample was collected, detailed project information, and information about the quality of the data. Over a million result records have been input to this system representing over 215 studies and 6,000 locations.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	EIM Database	Database	CMS Data not collected	CMS Data not collected	Under development
05-07	EIM Database	Database	$420K GFS	$0	$420K
	Program Change				**$420K**

Hydrography GIS Database

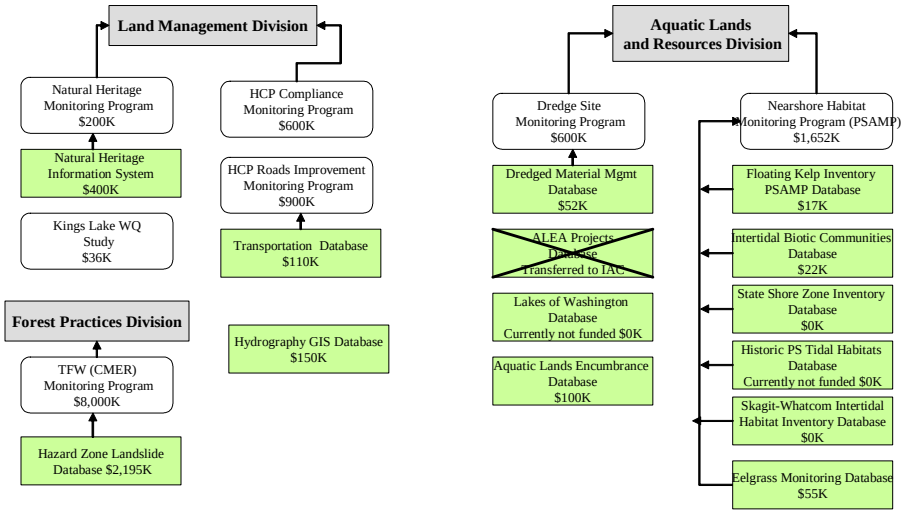
Provides a statewide Geographic Information System (GIS) data layer of surface water features for data analysis and mapping in support of natural resource management. Database used by Washington Department of Ecology staff, Department of Transportation and other state/federal/private agencies/organizations/individuals.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Ecology Hydrography Layer	GIS Database		$4,000K GFF	$4,000K
05-07	Ecology Hydrography Layer	GIS Database	Data not provided	Data not provided	Data not provided
	Program Change				**No change**

Department of Natural Resources

The Department of Natural Resources (DNR) serves as the chief steward for protecting and managing many valuable assets including more than 5 million acres of land - forests, farms, commercial properties, and underwater lands - all of which are managed to provide benefits to the public. The DNR also protects other public resources that belong to you - fish, wildlife, water, etc., through fire prevention and suppression and regulating timber harvest, use of tidelands, and mineral rights. The following chart typifies the monitoring programs and databases within DNR that relate to watershed health and salmon recovery.

Washington Department of Natural Resources



Forest Practices Division

The implementation of the Forest-Fish Agreement and new prescriptions under the Forest Practices Act (FPA) was intended to improve forest conditions on both state and private lands. In order to determine whether these actions have been effective monitoring is an important aspect of the agreement.

Timber Fish and Wildlife Cooperative Monitoring (CMER)

The historic mission of CMER has been to provide information that will help evaluate the Timber Fish and Wildlife (TFW) Agreement's effectiveness, and offer a framework for adaptive management. With the 2000 rules, CMER was officially charged with research and monitoring to support the adaptive management program. The CMER program was designed to answer questions about how forest practices affect public resources. The CMER program has several key purposes, including: Examining ways in which forestry activities, such as timber harvest and road construction, impact fish, wildlife, and water quality; providing the technical and informational framework for making and evaluating resource management decisions; and promoting understanding of ecosystem interactions. CMER has received 25 million dollars in 7 earmarked grants from the federal government through the NOAA Fisheries administered Pacific Coastal Salmon Recovery Fund as a federal commitment to implement the Forest and Fish Agreement for private timberlands in Washington. A substantial amount of this funding is yet to be expended.

This program is crucial to adaptive management for the forest practices rules. CMER research and monitoring provides the avenue for adjusting the forest practice rules (RCW76.09370[6]).

The Hazone is a database of areas that are known to produce landslide events. CMER unstable slopes projects are the main monitoring programs that these databases support, however, DNR-State Lands uses this data in their monitoring. Land managers, foresters, geologists, planners, office staff who classify forest practice applications, and researchers who are interested in landslides use this database. These databases are important (high) for conducting DNR business as they identify what areas on the landscape have had landslides or are prone to having landslides. That information is important for regulatory foresters and office staff who classify forest practices applications to identify the appropriate classification.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	TFW Cooperative Monitoring (CMER)	Effectiveness		$4,000K GFF $347K Adap Mgmt $256K WDFW staff $197K Ecology staff $100K Hazard Zone	$4,000K
05-07	TFW Cooperative Monitoring (CMER)	Effectiveness		$4,000K GFF $347K Adap Mgmt $256K WDFW staff $197K Ecology staff $0K Hazard Zone	$4,000K
	Program Change				**$0K**

Land Management Division

Natural Heritage Monitoring Program

Maintains an inventory of information on the state's significant ecological features, including rare species and high quality terrestrial and aquatic communities. Data are used for conservation planning purposes and during environmental reviews of various projects. Critical to meet RCW 79.70 and DNR Sustainable Forestry Initiative (SFI) Certification. Areas are not monitored for status/trends in habitat or species.

Natural Heritage Information System

Maintain GIS and tabular information on the state's significant ecological features, including rare species and high quality terrestrial and aquatic communities.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Natural Heritage Program	Inventory	CMS Data not collected	CMS Data not collected	$700K
05-07	Natural Heritage Program	Inventory	$130K GFS	$70	$200K
05-07	Natural Heritage Information System	Database	$260K GFS	$140	$400K
	Program Change				**($100K)**

Kings Lake Bog Water Quality and Hydrology Study

Baseline data on water quality and hydrology of Kings Lake Bog Natural Area Preserve. Describes water quality and hydrology of the site. Provides baseline data essential for tracking long-term changes in bog hydrology and chemistry. This information is important in making management decisions for the site.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Kings Lake Bog WQ	Status/trend	CMS Data not collected	CMS Data not collected	CMS Data not collected
05-07	Kings Lake Bog WQ	Status/trend	$36K GFS	$0	$36K
	Program Change				**$36K**

Hydrography GIS Database

The DNR utilized $3.0 million dollars of PCSRF funding to update their GIS hydrography layer for forested areas. Provides a statewide Geographic Information System (GIS) data layer of surface water features for data analysis and mapping in support of a wide range of natural resource regulation and management functions including (but not limited to) salmon recovery and watershed health. Database used by DNR staff, Timber/Fish/Wildlife participants and other state/federal/private agencies/organizations/individuals. Hydrography layer is most accurate for state forestlands. Much of eastern Washington is not covered.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	DNR Hydrography Layer	GIS Database	$150K	$0	$150K
05-07	DNR Hydrography Layer	GIS Database	$300K	$0	$300K
	Program Change				**$150K**

State Lands HCP Compliance Monitoring

As part of its HCP for state managed forest trust lands, approved by USFWS and NOAA Fisheries in 1997, DNR implements a major program of compliance monitoring and annual reporting, to ensure the objectives of the HCP and the federal Incidental Take Permit. Are being met. This monitoring covers both upland and aquatic species covered by the permit.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	HCP Compliance	Compliance	$600K	$0K	$600K
05-07	HCP Compliance	Compliance	$600K	$0K	$600K
	Program Change		**0**	**0**	**No change**

HCP Roads Improvement Monitoring Program

DNR inventories transportation routes on DNR forest roads to fulfill HCP and Forest & Fish requirements. Monitors number of fish barriers corrected, miles of new construction, reconstruction, and road abandonment. Projects completed in RMAPS. Mission Critical - to maintain HCP, DNR must report this data annually. To abide by the FPA, DNR maintains and reports RMAPs.

Transportation Database

Transportation database contains bridge and culvert inventory. Maintains GIS and tabular information on the state's significant ecological features, including rare species and high quality terrestrial and aquatic communities.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	HCP Roads Improvement Monitoring	Inventory & Implementation	$1,290K access road revolving fund		$1,290K
01-03	Transportation Database	Database	CMS Data not collected	CMS Data not collected	$110K
05-07	HCP Roads Improvement Monitoring	Inventory & Implementation	$900K access road revolving fund	$0	$900K
05-07	Transportation Database	Database	$110 GFS	$0	$110K
	Program Change		**$(390K)**	**0**	**($390K)**

Aquatic Lands and Resources Division

Aquatic Lands Enhancement Account (ALEA) Grant Program

Monitoring was generally associated with grant funded projects related to acquisitions and restorations of aquatic lands. Program was transferred by the legislature, in the 2005-07 biennium, to the IAC.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	ALEA Grant Program	Implementation	CMS Data not collected	CMS Data not collected	$424K
05-07	ALEA Grant Program	Inventory	Program transferred to IAC	Program transferred to IAC	Program transferred to IAC
	Program Change				**($424K)**

Puget Nearshore Habitat Monitoring Program

Monitoring data provides information on intertidal resources that are known to be ecologically important and is protected in statute. Eelgrass is an indicator of environmental health used by Puget Sound Action Team (PSAT) and other groups. This data is used for planning by many groups, including DNR. DNR is mandated to manage and protect kelp resources. Intertidal biotic communities support the food web and are an indicator of ecological health. Data supports PSAT's conservation and recovery priorities.

Floating Kelp Database

Database describes annual floating kelp inventories along the Strait of Juan de Fuca and Outer Coast from 1989-2004. High importance – data provides information on a resource that is known to be ecologically important, and is protected in statute. This data is used extensively for planning by many groups, including DNR. DNR is mandated to manage and protect kelp resources. Data supports PSAT's conservation and recovery priorities.

Intertidal Biotic Communities

Database describes intertidal species and physical characteristics (salinity and temperature) along saltwater shorelines in southern and central Puget Sound. High importance. Data provides information on the environmental health of Puget Sound's shorelines, which DNR is mandated to protect. Data supports PSAT's conservation and recovery priorities.

Skagit-Whatcom Intertidal Habitats

Database describes physical characteristics and vegetation along saltwater shorelines within these counties. Medium importance – data provides information on Puget Sound's habitats, but its value is decreased because it is no longer current and covers a limited area. DNR is mandated to protect the shorelines. Data supports PSAT's conservation and recovery priorities.

Puget Sound Eelgrass Database

Database describes annual eelgrass monitoring at sites throughout Greater Puget Sound. Mission Critical – data provides information on a resource that is known to be ecologically important and is protected in statute. Eelgrass is an indicator of environmental health used by PSAT and other groups. This data is used for planning by many groups, including DNR. DNR is mandated to manage and protect eelgrass resources. Data supports PSAT's conservation and recovery priorities.

State Shore Zone Inventory Database

Database describes physical and biological characteristics of saltwater shorelines throughout Washington State (approximately 3000 miles). Mission critical – data provides information on Puget Sound's shoreline characteristics. This data is used extensively for planning by many groups, including DNR. DNR is mandated to protect the shorelines. Data supports PSAT's conservation and recovery priorities.

Historic Puget Sound Tidal Habitats Database

Database describes historic tidal habitats along the shorelines and river deltas of Puget Sound. The primary source for these data is historic maps created by the United States Coast and Geodetic Survey between 1852 and 1926. Current tidal wetland habitats were also characterized. Database is complete. Additional refinements to database may occur if other sources of historical habitat characterizations can be identified.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Puget Sound Nearshore Monitoring PSAMP	Status/trend	$1,200K ALEA		$1,200K
05-07	Puget Sound Nearshore Monitoring PSAMP	Status/trend	$1,652K ALEA	$0	$1,652K
05-07	Floating Kelp database	GIS Database	$17K ALEA	$3K NOAA	$20K
05-07	Intertidal Biotic Communities Database	Database	$22K ALEA	$0	$22K
05-07	Skagit Whatcom Intertidal Habitat	GIS Database	Currently not funded	Currently not funded	$0
05-07	PS Eelgrass	GIS Database	$55K ALEA	$0	$55K
05-07	State Shore Zone Inventory Database	GIS Database	Currently not funded	Currently not funded	$0
05-07	Historic Puget Sound	GIS	Currently not	Currently not	$0

	Tidal habitats	Database	funded	funded	
	Program Change				**$452K**

Aquatic Lands Encumbrance Database

Database characterizes use of state-owned aquatic lands within the state of Washington. Uses of state-owned aquatic lands are presented as data points with numerous attributes that characterize the use. Associated components of the dataset characterize "over water" structures over state-owned aquatic lands as polygons. This data system may eventually replace a paper data management system that DNR is require to maintain relating to uses of state owned aquatic lands (RCW 79.125.040). Additionally, this data system is already in use by aquatic land managers for management of state-owned aquatic lands.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Aquatic Land Encumbrance Database	Inventory	CMS Data not collected	CMS Data not collected	Not in existence
05-07	Aquatic Land Encumbrance Database	Inventory	Data not provided	Data not provided	$100K
	Program Change				**$100K**

Dredge Site Monitoring Program

Dredged Material Management Database (DMMP) is tasked with management of designated open-water dredged material disposal sites in Puget Sound and coastal Washington. The organization is a cooperative agreement between US Army Corps of Engineers, US EPA Region 10, and the Washington Departments of Ecology and Natural Resources. Dredged materials destined for open water disposal are evaluated for suitability. Dredging and disposal activities are monitored for conformity to permit specifics. Disposal sites are environmentally monitored to evaluate environmental impacts.

Dredged Material Management Database

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Dredged material management	Database	CMS Data not collected	CMS Data not collected	$54K
	Dredge Site Monitoring	Validation	CMS Data not collected	CMS Data not collected	$600K
05-07	Dredged material management	Database	No funds allocated	No funds allocated	$0
	Dredge Site Monitoring	Validation	$400K State revolving fund	$0	$400K
	Program Change				($200K)

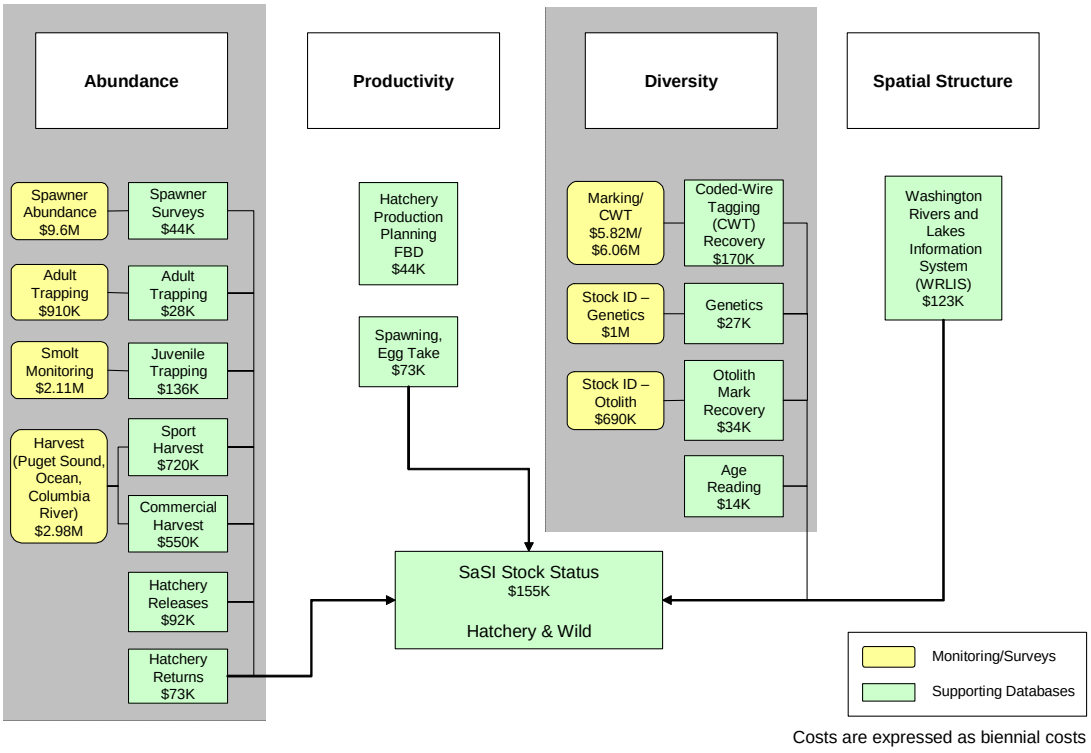
Lakes of Washington Database

Databases provide an overall inventory of the lake resources in the state including characterizations of water chemistry, elevation, size, etc. For a subset of the lakes evaluated, the Watershed area of the lakes has also been delineated using 30m DEMs. Medium importance. Data provides a critical context for management of lake ecosystems. No funds are currently allocated to this database.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Lakes of Washington Database	Database	CMS Data not collected	CMS Data not collected	CMS data not collected
05-07	Lakes of Washington Database	Database	Currently no funds provided	Currently no funds provided	Currently no funds provided
	Program Change				**None**

Department of Fish and Wildlife

Department of Fish and Wildlife
Salmonid Productivity (VSP) Monitoring Flow Chart



Costs are expressed as biennial costs

To meet Agency mandates for fish management and to move toward successful recovery of wild salmon populations, it is necessary to monitor Viable Salmon Population (VSP) parameters: abundance, productivity, diversity, and spatial structure. Each of the following monitoring programs and databases represent one of the VSP parameters as indicated in the above diagram.

Salmonid Abundance

Adult Spawner Abundance

Provides annual estimates of salmon spawning escapement and measurement of the proportion of hatchery fish in natural spawning areas. This monitoring program has created a continuous database beginning in the 1950s with significant additions to survey coverage through the 1980s and 1990s. The current level of spawning ground survey coverage is the bare minimum needed both for fish management needs and to monitor trends in spawning populations. These data are crucial for de-listing populations listed under the federal Endangered Species Act.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Spawner Abundance	Status/trend	CMS Data not collected	CMS Data not collected	$9,800K
01-03	Spawner Abundance Surveys	Database	CMS Data not collected	CMS Data not collected	$20K
01-03	**Total**				**$9,820K**
05-07	Spawner Abundance	Status/trend	$3,840K	$5,760K	$9,600K
05-07	Spawner Abundance Surveys	Database	$44K	$0	$44K
05-07	**Total**		**$3,884K**	**$5,760K**	**$9,644K**
	Program Change				**Decreased by $176K**

Adult Trapping

This database covers WDFW projects in Puget Sound, the Washington Coast, and selected Columbia River sites where adult salmon are trapped at dams, ladders, and hatcheries. Separate databases are maintained by WDFW regional staff and Habitat Program staff. Adult escapement for selected watersheds/populations within Puget Sound, the Washington coast, and Columbia River are monitored. Escapements developed from trapping are either counts or estimates of much higher precision than typical spawning ground survey based estimates and, therefore, track the status and trends in population abundance with a high degree of accuracy. These data are crucial for de-listing populations listed under the federal Endangered Species Act.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Adult trapping	Status/trend	CMS Data not collected	CMS Data not collected	Unknown
01-03	Adult trapping Database	Database	CMS Data not collected	CMS Data not collected	Unknown
01-03	**Total**				Unknown
05-07	Adult trapping	Status/trend	$36K	$874K	$910K
05-07	Adult trapping Database	Database	$2K	$26K	$28K
05-07	**Total**		**$38K**	**$900K**	**$938K**
	Program Change				**Unknown**

Counting Juvenile Salmon Migrating to the Sea (Smolts)

This monitoring program quantifies the annual freshwater production of selected species and stocks of wild salmon. It answers the questions: What is the status/trend of juvenile migrant salmon in selected waters? What is the annual freshwater production of selected species in selected waters? These questions must be answered in order to determine whether freshwater habitat has been improved. The SRFB relies on this information for its IMW validation monitoring program. NOAA Fisheries, the Governor's Salmon Recovery Office, the Salmon Recovery Funding Board, and the Governor's Forum on

Monitoring rely on this data for the State of the Salmon Report and for informing listing/de-listing criteria decisions. Co-managers rely on this information to evaluate and forecast the abundance of wild salmonid populations for fisheries management. This monitoring program is of high importance to WDFW because it provides key information on the status and trends in wild salmonid populations. It enables the evaluation and tracking of stock performance in the freshwater environment where most of the salmon restoration activities are occurring. Notwithstanding its use for monitoring salmon recovery, data from this program is also used to forecast coho run sizes and to develop management models (e.g. spawner recruit models) for wild populations. These data are crucial for de-listing populations listed under the federal Endangered Species Act.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Juvenile trapping	Status/trend	CMS Data not collected	CMS Data not collected	$2,400K
01-03	Juvenile trapping Database	Database	CMS Data not collected	CMS Data not collected	Unknown
01-03	**Total**				**$2,400K**
05-07	Juvenile trapping	Status/trend	$84K	$2,026K	$2,110K
05-07	Juvenile trapping Database	Database	$6K	$130K	$136K
05-07	**Total**		**$90K**	**$2,156K**	**$2,246K**
	Program Change				**Decreased by $154K**

Salmonid Stock Inventory (SaSI)

The SaSI database contains information on salmonid stock identification, abundance, status, and life history in Washington State. This information can be used to track the progress of recovery efforts throughout the state. The SaSI database has a broad audience, including WDFW staff, Washington tribes, federal agencies (NOAA-Fisheries, US Fish and Wildlife Service, USDA Forest Service, EPA), other state agencies (DNR, Ecology, Conservation Commission), county and municipal governments, consultants, non-governmental agencies (particularly groups working on conservation of fish and fish habitat), students and interested citizens. Groups involved with stock/habitat recovery efforts such as the Hatchery Scientific Review Group, the NOAA-Fisheries Technical Recovery Teams, and lead entities have made use of SaSI data. Mission critical - the SaSI database is the only single source for statewide stock-specific abundance and status information with which to track recovery of ESA-listed and state/tribal depressed and critical stocks.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
2001	SASI	Database	CMS Data not collected	CMS Data not collected	$102K
2001	**Total**				**$102K**
05-07	SASI	Database	$155K	$0	$155K
05-07	**Total**		**$155K**	**$0**	**$155K**
	Program Change				**Increased by $53K**

Harvest

Puget Sound, Ocean, and Columbia River Harvest Monitoring

Puget Sound – Puget Sound Fishing effort, catch by species/area/boat type for salmon, marine fish and shellfish (crab and shrimp); CWT recoveries and mark information from salmon; scales from salmon for age analysis; and other biological samples (DNA, lengths, weights) from salmon and marine fish. Test fishing is conducted in selective chinook and coho fisheries to determine encounter rates, mark rates, and to collect biological samples for chinook (DNA, scales, lengths). Mission-critical. Without this monitoring, the fisheries in Puget Sound could not be prosecuted and significant opportunity and economic benefit would be lost. These fishery monitoring data are required to meet obligations with the Treaty Tribes under the Mass Marking Agreement and to maintain the integrity of the coastwide CWT database, provide marine fish catch estimates under the federal RecFIN contract, provide salmon catch estimates that are shared with the Treaty Tribes for fishery management purposes, and fulfill commitments under the Endangered Species Act administered by the National Marine Fisheries Service.

Ocean – Catch estimation and in-season quota monitoring of commercial troll and recreational ocean fisheries, coded wire tag (CWT) collection, biological sampling (DNA, tags, lengths, weights). Mission-critical. Without monitoring of federally managed fisheries (which includes all ocean fisheries), fisheries could not be prosecuted and significant opportunity and economic benefit would be lost; data used to assess population status for salmon, halibut, and groundfish species would be lost or compromised.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Puget Sound Harvest	Status/trend	CMS Data not collected	CMS Data not collected	Summarized below
01-03	Ocean Harvest	Database	CMS Data not collected	CMS Data not collected	$1,500K
01-03	Columbia River harvest	Database	CMS Data not collected	CMS Data not collected	Summarized below
01-03	**Total**				**$3,600K**
05-07	Puget Sound harvest	Status/trend	$600K	$600K	$1,200K
05-07	Ocean Harvest	Database	$327K	$1,093K	$1,420K
05-07	Columbia River Harvest	Database	$0	$360K BPA	$360K
05-07	**Total**		**$927K**	**$2,053K**	**$2,980K**
	Program Change				**Decreased by $620K**

Sport Harvest Catch Record Card (CRC)

Contains annual post-season harvest estimates of salmon caught by recreational anglers. The estimates are produced using the harvest reported on catch record cards issued to sport anglers at the time they purchase a sport fishing license. It is of mission critical importance. Data provides basis for treaty/non-treaty allocations, sport/commercial allocations, and stock run sizes.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Sport CRC Database	Database	CMS Data not collected	CMS Data not collected	$770K
01-03	**Total**				**$770K**
05-07	Sport CRC Database	Database	$720K	$0	$720K
05-07	**Total**		**$720K**	**$0**	**$720K**

	Program Change				**Decreased by $50K**

Commercial Fisheries (LIFT) Tickets

The LIFT database was put into operation in 1970 and contains information about all commercial fishery products landed in Washington. Contains species, gear, area, numbers, pounds and other related data. Mission - Critical. Fish Ticket data are required to fulfill agency mandate to regulate commercial harvest and document state tax-related aspects of this commercial activity.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	LIFT Database	Database	CMS Data not collected	CMS Data not collected	$144K
01-03	**Total**				**$144K**
05-07	LIFT Database	Database	$357K	$193K	$550K
05-07	**Total**		**$357K**	**$193K**	**$550K**
	Program Change				**Increased by $406K**

Hatchery Releases Database

This database contains information about hatchery plants, production, liberations, and hatchery mark/tag information. Contains hatchery release information from 1900 to present.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Hatchery Releases	Database	CMS Data not collected	CMS Data not collected	Unknown
01-03	**Total**				Unknown
05-07	Hatchery Releases	Database	$44K	$48K	$92K
05-07	**Total**		**$44K**	**$48K**	**$92K**
	Program Change				**Unknown**

Hatchery Returns Database

Database contains daily hatchery adult and jack returns, rack counts, fish released to stream, mortalities, carcass distribution, mark/tag recoveries, transfers, and adult plants. Also includes spawn and egg takes (separate survey).

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Hatchery Returns	Database	CMS Data not collected	CMS Data not collected	Unknown
01-03	**Total**				Unknown
05-07	Hatchery Returns	Database	$73K	$0	$73K
05-07	**Total**		**$73K**	**$0**	**$73K**
	Program Change				**Unknown**

Productivity

Hatchery Production and Planning Fish Database

Database contains the planned hatchery production; egg takes, transfers, plants, production, and liberations for the coming years. It is agreed upon by the WDFW and treaty tribes. Database is considered high to mission critical. Without accurate planning information agency cannot fulfill measurement objectives, tribal agreements, or monitoring requirements.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Hatchery Production and Planning	Status/trend	CMS Data not collected	CMS Data not collected	$200K
01-03	**Total**				**$200K**
05-07	Hatchery Production and Planning	Database	$44K	$0	$44K
05-07	**Total**		**$44K**	**$0**	**$44K**
	Program Change				**Decreased by $156K**

Spawning and Egg Take Database

Daily hatchery spawning activities including species, stock, trap site, estimated egg take, etc. Information on numbers spawned that are mark/tagged.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Spawning and egg take database	Operations	$700K*	$1,600K*	$2,300K
01-03	**Total**		**$700K**	**$1,600K**	**$2,300K**
05-07	Spawning and egg take database	Database	$73K	$0	$73K
05-07	**Total**		**$73K**	**$0**	**$73K**
	Program Change				**Decreased by $2,227K**

* Most of this cost attributed to operations not for database work

Diversity

Hatchery Marking and Coded Wire Tag (CWT) Program

Coded wire tags allow managers to trace the contribution of Washington stocks to all coastal fisheries from Alaska to California. Also allows estimates of marine survival, hatchery stock performance, and other evaluations. Mass marking of steelhead, chinook and coho salmon allow determinations of hatchery impacts to wild salmon populations by allowing positive identification of hatchery fish on the spawning grounds. It also allows managers to target hatchery fish in mixed stock fisheries and release wild fish. The information is used by all coastal states and treaty Indian tribes, NOAA Fisheries, Pacific Salmon Commission, and the Pacific Fishery Management Council.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Hatchery CWT	Status/trend	CMS Data not collected	CMS Data not collected	$4,900K
01-03	Hatchery Marking		CMS Data not collected	CMS Data not collected	Combined with CWT
01-03	CWT Recovery Database	Database	CMS Data not collected	CMS Data not collected	$144K
01-03	**Total**				**$5,044K**
05-07	Hatchery Marking	Operations	$2,620K*	$3,200K	$5,820K
05-07	Hatchery CWT	Operations	$910K *	$5,150K	$6,060K
05-07	CWT Recovery Database	Database	$170K	$0	$170K
05-07	**Total**				**$12,050K**
	Program Change				**Cannot make comparison**

* Most of this cost attributed to operations not for database work

Stock Identification and Genetics Program

The WDFW Genetics Lab collects genetic data on fish and wildlife populations, individuals, captive breeding systems (e.g., hatchery programs, or enhancement projects), and forensics-law enforcement related samples or evidence. It is used: (1) to ascertain the geographic structure of fish and wildlife populations using genetic data (e.g. determine number of stocks and the spatial distribution within a defined geographic area). This provides essential data for ESA issues and to help set hunting or fishing (recreational or commercial) limits; (2) help design and determine efficacy of captive breeding systems such as for endangered species recovery or for production (e.g., salmonid hatcheries). This would include studies such as parentage analysis; (3) identify species or population of origin of individual samples for injury assessments following natural or anthropogenic disturbances, or as evidence in law enforcement-related cases (includes genotyping or genetic fingerprinting of individuals); (4) to determine to what degree individuals are hybrids or introgressed between two or more populations/species; (5) mixed-stock fishery analysis; (6) others. DNA tissue samples are collected, along with date, geographic locality (defined at various levels of spatial accuracy), collector, collection process, etc. Biological data such as linear measurements may also be collected, but this is not done on a routine basis. Mission Critical – for the most part the primary source of population genetic data for trust fish and wildlife resources are provided by the WDFW Genetics Laboratory. Genetic data provide an essential component to the management of trust resources.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Stock ID Genetics Laboratory and Monitoring		CMS Data not collected	CMS Data not collected	$1,040K
01-03	Stock ID and Genetics database		CMS Data not collected	CMS Data not collected	Unknown
01-03	**Total**				**$1,040K**
05-07	Stock ID Genetics Laboratory and Monitoring	Baseline Assessments	$200K GFS	$800K	$1,000K
05-07	Stock ID and Genetics database	Database	$0	$27K	$27K
05-07	**Total**		**$200K**	**$827K**	**$1,027K**
	Program Change				**Decreased by $13K**

Stock Identification Fish Age Structure (Otolith) Program

Monitoring program is used for evaluation of restoration and supplementation projects for salmonids, including listed chum salmon in the Hood Canal and Lower Columbia River ESUs. Otolith marking programs are designed to answer questions on the effects of artificial cultural strategies (e.g. time and size at release, release location) and inadvertent domestication on salmonids. Specifically, our studies determine growth, survival (from one life-history stage to another, e.g. fry to smolt, smolt to adult), distribution (among and within rivers), age, size, and timing of maturation, abundance, and the biological characteristics of cultured salmonids. Strontium marking methods are being used to evaluate the success of habitat improvements in chum salmon spawning areas located in the Hood Canal and Lower Columbia River ESUs. Additionally, Tran generational marks produced by injecting strontium into gravid rockfishes is being used to monitor the distribution patterns of rockfish juveniles in Puget Sound. This is the only extant thermal and strontium-marking lab in Washington State. However, the Tulalip Nation is developing an otolith laboratory to process otoliths from their fisheries.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Stock Aging (otolith) Database		CMS Data not collected	CMS Data not collected	Unknown
01-03	Otolith Mark recovery		CMS Data not collected	CMS Data not collected	Unknown
01-03	Age reading		CMS Data not collected	CMS Data not collected	$160K
01-03	**Total**				**$160K**
05-07	Stock Aging (otolith) Monitoring	Effectiveness	$0	$690K	$690K
05-07	Otolith Mark recovery	Database	$0	$34K	$34K
05-07	Age reading	Database	$14K	$0	$14K
05-07	**Total**		**$14K**	**$724K**	**$738K**
	Program Change				**Increased by $578K**

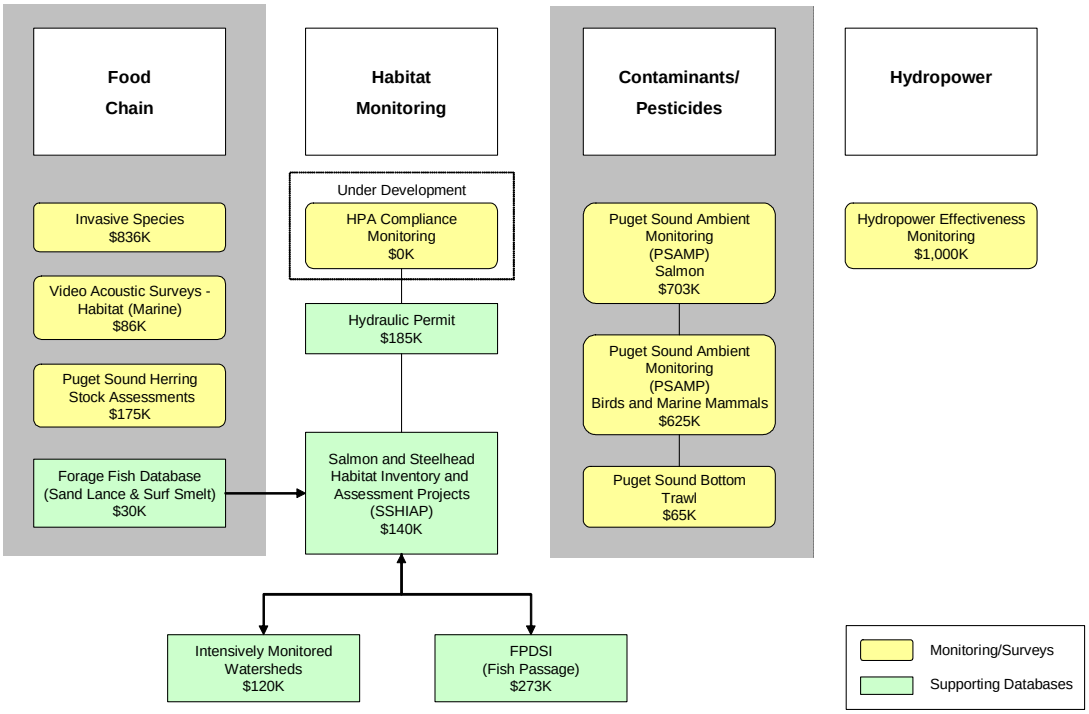
Spatial Structure

Washington Lakes and Rivers Information System GIS Database

A statewide GIS layer of natural fish presence, spawning, and rearing reaches compiled onto the 1;24,000 resolution routed streams layer for Washington State. These data represent generalized fish presence and use type data for anadromous salmonids (including bull trout).

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	WLRIS	GIS Database	CMS Data not collected	CMS Data not collected	Not in CMS
01-03	**Total**				Unknown
05-07	WLRIS	GIS Database	$123K	$0	$123K
05-07	**Total**		**$123K**	**$0**	**$123K**
	Program Change				**Unknown**

Department of Fish and Wildlife
Watershed Health Monitoring Flow Chart



Costs are expressed as biennial costs

Food Chain

Invasive Species Monitoring

Monitors certain tunicate species, green crab, mitten crab, zebra mussel, and other invasive species to evaluate potential economic impacts, competition with native species, and efforts intended to prevent or control their spread. The Atlantic salmon monitoring program is rated as medium importance. The issue is of regional concern and similar programs are conducted in Alaska and B.C. The potential impact of Atlantic salmon on native salmon is controversial and efforts to evaluate the possibility of Atlantic salmon establishing reproducing populations should continue.

Monitoring for Zebra mussels and recreational watercraft is of high importance. Zebra mussels continue to spread westward towards Washington State waters and recreational boaters are a major pathway for spread. The cost to protect and maintain infrastructure (dams, water supply uptakes, etc.) is millions of dollars in infested areas and many Washington waters provide ideal conditions for zebra mussel populations to thrive. Early detection and rapid response is critical to preventing or reducing impact.

European green crab monitoring is rated as a high priority. In areas on the east coast where green crab populations have exploded, the impacts on shellfish, lobster, crab, and shrimp fisheries have been profound. The volunteer monitoring program in Puget Sound provides an early detection system that could allow for the implementation of a control program to reduce impact on other species managed by WDFW. The Aquatic Nuisance Species Committee and some members of the Northwest Straits Commission have recommended the expansion of the volunteer monitoring program to include other invasive species. The benefits of this would be an inclusive program covering multiple species, on-going data collection beyond green crab, and consistent geographic coverage that is not currently available.

Monitoring ship Ballast Water is rated as mission critical. Ballast discharges can move invasive species to Washington waters from around the world. One highly invasive species (including disease

organisms) could impact the entire food chain causing harm to a broad range of fish and wildlife species. Prevention is the most effective way to stop the impact of invasive species and monitoring ballast discharges is critical to managing this pathway.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Invasive species monitoring	Status/trend	CMS Data not collected	CMS Data not collected	$270K
01-03	**Total**				**$270K**
05-07	Invasive species monitoring	Status/trend	$428K	$408K	$836K
05-07	**Total**		**$428K**	**$408K**	**$836K**
	Program Change				**Increased by $566K**

Marine Video Acoustic Surveys

The purpose of the quantitative video survey is to estimate the populations of rockfish, lingcod, and other fish and shellfish associated with rocky habitats within the various basins of the inland marine waters of Washington. A WDFW vessel is used to deploy a quantitative video camera at randomly-selected rocky habitat stations in the nearshore zone. These devices are used to estimate fish densities and describe habitats at the selected station. The station densities are averaged and the population estimated by multiplying the average density by the area of the region and stratum. Regions are rotated over the years such that most regions are surveyed every three years. Survey estimates have been imprecise due to the difficulty in estimating the radius of the video plot and new studies are showing that towed camera and ROV transects are more informative. Provides estimates of key species with a percent coefficient of variation of 30% or less, estimates of the size composition of key marine fish and shellfish, evaluate trends over time, and map rocky habitat. Determine the relationship between key species and habitat factors - bottom fish especially copper, quillback, brown and other rockfishes, lingcod, kelp greenling, invertebrates including red and green sea urchins and sea cucumbers. *Current funding level of $86K (of needed $126K) does not cover operational costs (i.e., boats and equipment) so surveys will need to be discontinued.*

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Marine Video Acoustics	Status/trend	CMS Data not collected	CMS Data not collected	$ 210K
01-03	**Total**				**$210K**
05-07	Marine Video Acoustics	Status/trend	$86K	$0	Funded at $86K of the $126K needed to fully fund
05-07	**Total**		**$86K**	**$0**	**$86K**
	Program Change				**Decreased by $124K**

Puget Sound Herring Stock Assessments

Herring stock assessment project provides annual estimates of herring spawning biomass and spawning locations for all Washington State herring stocks for fishery and habitat management purposes. Annual herring spawning biomass is estimated for each stock using spawn deposition surveys and/or acoustic-trawl surveys. Mission critical due to fishery, habitat, and ecological issues related to herring abundance

and distribution. Herring stock status monitoring accomplished by this program are required as part of the Boldt Case decision. Herring is the only forage fish for which a long-term abundance database and stock status monitoring program exists. The Forage Fish Database is part of the SSHIAP Program. The database provides a spatial representation of where important food fish of salmon are known to spawn in Puget Sound and coastal marine areas. Important attributes also include beach habitat characteristics and egg (spawn) density. Because forage fish spawning success is closely tied to nearby land use practices, this database provides local planning jurisdictions an important resource in the protection of salmon and salmon habitat.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Puget Sound Herring	Status/trend	CMS Data not collected	CMS Data not collected	Unknown
01-03	Forage Fish Database	Database	CMS Data not collected	CMS Data not collected	Unknown
01-03	**Total**				**Unknown**
05-07	Puget Sound Herring	Status/trend	$44K	$131K	$175K
05-07	Forage Fish Database	Database	$30K	$0	$30K
05-07	**Total**		**$30K**	**$0**	**$205K**
	Program Change				**Unknown**

Habitat Monitoring

Hydraulic Permit Compliance Monitoring (HPA)

The purpose of the monitoring program is to determine if persons working within the waters of the state are in compliance with the provisions of their permit and have implemented the project as designed and approved. Addresses protection of stream riparian zones and instream habitat for all species. The HPA program is our only regulatory tool to protect fish and fish habitat. On average, 4,000 HPAs are issued annually for work that impacts habitat if not done as permitted. Habitat loss from non-compliance can be significant. The database contains permit information for Hydraulic Project Approvals (HPAs) issued since 1989. As of Nov. 2004, the database also includes the permit itself. HPAs are regulated under RCW 77.55. While the statute doesn't specifically require a database, a legislatively established Task Force on HPAs had a comprehensive database as a recommendation and this database will be linked with the E-Permitting Service (statewide) under development by the Governor's Office of Regulatory Assistance.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	HPA Monitoring	Compliance	CMS Data not collected	CMS Data not collected	$1,090K
01-03	HPA Database	Database	CMS Data not collected	CMS Data not collected	$220K
01-03	**Total**				**$1,310K**
05-07	HPA Monitoring	Compliance	$0	$0	No dedicated funding
05-07	HPA Database	Database	$185K GFS	$0K	$185K
05-07	**Total**		**$185K**	**$0K**	**$185K**
	Program Change				**Decreased by $1,125K**

Salmon and Steelhead Habitat Inventory Assessment Project (SSHIAP)

SSHIAP is a partnership-based information system designed to characterize the distribution and habitat conditions of salmonid stocks in Washington at the 1:24,000 scale. The SSHIAP system delineates streams and estuary/nearshore marine waters into segments based on physical characteristics and habitat types. These segments provide a consistent spatial framework for integrating a wide variety of habitat information and subsequent analyses. The SSHIAP system quantitatively characterizes habitat conditions, maps stock distribution and status, and links habitat conditions and stock distribution with productivity modeling efforts. SSHIAP is designed to provide these data in map and digital formats for statewide, ESU, watershed, and local planning and conservation actions. In addition to being a database of habitat attributes, SSHIAP directly supports other databases within WDFW: Intensively Monitored Watershed (IMW) database; the fish passage barrier and barrier repair database and irrigation screening database (FPDSI); Ecosystem Diagnosis and Treatment (EDT); and State of the Salmon Report Habitat Indicators. The FPDSI database is essential to salmon recovery groups and Lead Entities. It provides the opportunity to prioritize from among hundreds of restoration projects, which allows limited funding to provide the greatest benefit for salmonid recovery. The database also provides information necessary to measure the success of recovery efforts by monitoring the successful implementation of fish passage barrier removals. Status of fish passage barrier removal projects are reported biennially in the State of the Salmon Report.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	SSHIAP	Database	CMS Data not collected	CMS Data not collected	$350K
01-03	FPDSI	Database	CMS Data not collected	CMS Data not collected	$794K
01-03	**Total**				**$1,144K**
05-07	SSHIAP	Database	$140K	$0	$140K
05-07	FPDSI	Database	$273K	$0	$273K
05-07	IMW	Database	$120K	$0	$120K
05-07	**Total**		**$533K**	**$0**	**$533K**
	Program Change				**Decreased by $611K**

Contaminants and Pesticides

Puget Sound Ambient Monitoring Program (PSAMP)–Salmon

General purpose of this program is to monitor the status and trends of fish health in Puget Sound. This component fits into the larger PSAMP effort, which is focused on ecosystem health. Generally monitor temporal and spatial trends of toxics, and effects from exposure to toxics, in marine and anadromous fishes. The Fish Component also provides fish toxics data to human health agencies for their assessments. Measure toxics in selected species (e.g., salmon, English sole, rockfish, and herring) over a broad geographic area in Puget Sound, and through time. Monitor measure and identify specific effects from exposure to toxics. Department of Health uses these data for setting meal limits to protect human health; Ecology uses these data to establish tissue based clean-up requirements for sediment remediation and to meeting some of their 303-d assessments required under the Clean Water Act. EPA uses this data to set priorities for Superfund environmental assessments. Mission critical - WDFW's mission of sound stewardship of fish and wildlife can only be achieved by ensuring the contaminants levels in fish and shellfish do not affect the health of Puget Sound fishes and compromise their suitability for human consumption. Chemical contaminants can reduce the productivity of fish populations and also

reduce the suitability of fish for human consumption thereby inferring with Agency goals to maximize recreational and commercial fishing opportunities, compatible with healthy and diverse fish and wildlife opportunities.

Puget Sound Ambient Monitoring Program (PSAMP) – Birds

This program provides trends, distribution, and abundance of select species of marine birds and marine mammals utilizing Puget Sound and to contribute information to assess overall health of the Puget Sound ecosystem. Specific objectives include collection of population trend data using best available science, creation and maintenance of digital databases and GIS coverage, and production of analyses and other report and map products. Documentation of population indices gathered by standardized aerial methodologies and specialized survey expertise are intended to be continued over a multi-year effort, combined with standardized breeding surveys, allowing the data to be used for analysis of patterns and changes in distribution, abundance, density, and trends for the key indicator marine species selected. WDFW programs and the public rely on this database or its products because of concerns related to oil spill effects or mitigation, status of threatened and endangered species, update of priority habitat and species databases (PHS), resolution of conflicts with commercial fisheries and ESA listed species, and varied requests from county/local governments and planning groups.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	PSAMP Salmon	Status/trend	CMS Data not collected	CMS Data not collected	$720K
01-03	PSAMP Birds	Status/trend	CMS Data not collected	CMS Data not collected	Unknown
01-03	**Total**				**$1,144K**
05-07	PSAMP Salmon	Status/trend	$703K	$0	Funded at $703K of the $940K needed to fully fund
05-07	PSAMP Birds	Status/trend	$625	$0	$625K
05-07	**Total**		**$1,328K**	**$0**	**$1,328K**
	Program Change				**Decreased by $184K**

Puget Sound Bottom Trawl Monitoring

The purpose of the bottom trawl survey is to estimate the populations of bottomfish and macro-invertebrates within the various basins of the inland marine waters of Washington. A chartered fishing vessel is used to tow a research bottom trawl at randomly-selected stations stratified by depth. The catch is processed by identifying, counting and weighing all species encountered. Their numbers and weights are divided by the area swept by the net at each station. These densities are then averaged and the population estimated by multiplying the average density by the area of the region and stratum. Regions are rotated over the years such that most regions are surveyed every three years.

Provides estimates of key species with a percent coefficient of variation of 30% or less. Provide estimates of the size composition of key marine fish and shellfish. Evaluate trends over time. The need for these data is high because it provides fishery-independent times series data to assess status and abundance trends of sensitive and commercially important species including Pacific cod, Pacific hake, walleye pollock, flatfishes, and rockfishes. Provides information on fish abundance in Hood Canal. Provides information on the demographic characteristics of key species. Provides information on ecosystem functions and health.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	PS Bottom Trawl	Status/trend	CMS Data not collected	CMS Data not collected	$196K
01-03	**Total**				**$196K**
05-07	PS Bottom Trawl	Status/trend	$65K	$0	$65K
05-07	**Total**		**$65K**	**$0**	**$65K**
	Program Change				**Decreased by $131K**

Hydropower Effectiveness Monitoring

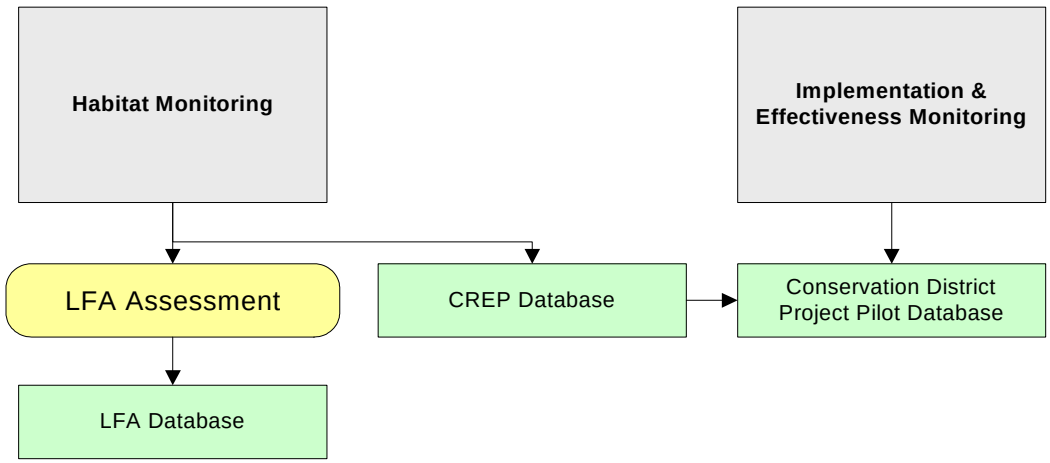
Monitors the effectiveness of various hydropower facilities in meeting mitigation requirements necessary for salmon and trout survival. Major areas of interest are flow constraints and fish passage. Information regarding the effectiveness of various hydropower facilities in meeting life requirements for salmon and steelhead is used by FERC in making license decisions and by Ecology in making 401 Certification decisions. Continual involvement with the major hydro projects and their owners to improve fish friendly operation of the projects is a critical component of agency business. Current operations do not include an across the board evaluation of hydropower facilities as recommended in the CMS.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Hydropower Effectiveness	Effectiveness		$1,000K	$1,000K
01-03	**Total**			**$1,000K**	**$1,000K**
05-07	Hydropower Effectiveness	Effectiveness		$1,000K	$1,000K
05-07	**Total**			**$1,000K**	**$1,000K**
	Program Change				**No change**

The Washington State Conservation Commission

About 37% of salmon streams pass through private land used for agriculture (NMFS and USFWS 2000). The Conservation Commission provides structure and leadership to Washington State's 47 conservation districts that in turn provide education, technical assistance, and the implementation of best land management practices to private citizens primarily on agricultural lands. This contributes to the wise stewardship and conservation of soil, water, and other natural resources that would otherwise not be improved. Specifically, conservation districts often develop salmonid restoration and protection projects that improve riparian and floodplain conditions, conserve water flows, reduce sediment to streams, increase fish and wildlife habitat, and improve water quality. Past database and monitoring activities include the Limiting Factors Analysis Program. Current databases include the Conservation Reserve Enhancement Program (CREP) database. In development is the Watershed Data Pilot Project. Each of these is discussed below.

Conservation Commission
Watershed Health Monitoring Flow Chart



7-6-06

Conservation Reserve Enhancement Program (CREP)

Currently, the Conservation Commission manages one centralized database that houses information on salmonid habitat: the CREP database. CREP is a voluntary program that restores and protects high priority riparian habitat along salmonid streams.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
2006	CREP	Database	$10K (rough estimate, part of larger program)	$0	10K
	Total				**$10K**
	Program Change				**$0**

Limiting Factors Analysis

The Limiting Factors Analysis Program primarily spanned from 1998-2003 with two smaller analyses in 2003-2005. It is no longer maintained due to lack of funding. Its purpose was to integrate and prioritize all available salmon habitat information to help Lead Entities develop strategies for salmon habitat recovery.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
1999-2001	Limiting Factors Analysis	Analysis	$1733K	$0	$1733K
2001-2003	Limiting Factors Analysis	Analysis	$1733K	$0	$1733K
2003-2005	Limiting Factors Analysis	Analysis	$801K	$0	$801K
	Total				**$4267K**
	Program Change				**($4267K)**

Watershed Data Pilot Project

Each year conservation districts develop hundreds of salmonid restoration and protection projects, but most of these projects are tracked only at the local level and sometimes only in written files. A data system will greatly improve the ability of the Conservation Commission and conservation districts to report on expenditures and habitat improvements, integrate with other state agency data and GIS systems, contribute data to other agencies and entities, and better communicate with the general public. In addition, every two years the Governor's Salmon Recovery Office is required to write a State of the Salmon report, and part of that report is to show the quantity and location of salmonid projects across the state. The report is used to communicate salmon recovery progress and efforts to national and state legislators and is important to secure federal funding. While the conservation districts specialize in the development and installation of projects, we cannot report on most of those projects due to a lack of a centralized database and data reporting tools.

To address these needs, the Conservation Commission is working with a vendor to develop a data system that will:

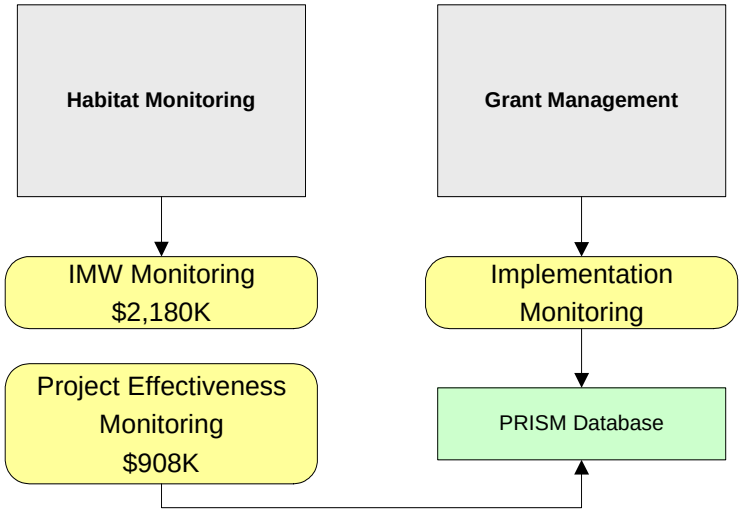
1) Supply needed project data from the Conservation Districts to the GSRO and other state entities.
2) Integrate data from other state databases such as PRISM, CREP, and GIS layers from Ecology's EIM, 303(d), water rights databases, WDFW's SaSI, hydrology, fish distribution, and priority habitat databases, NWIFC stream attributes database, and DNR's soils, erosion, and shaded relief databases,
3) Automatically fill some of the reporting needs at both the state (Conservation Commission) and local (conservation district) levels.
4) Improve communication between conservation districts and private landowners.

Year	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
2007-2009	WDPP	Database	$440K (draft proposed)	$0	$440K
	Total				$440K
	Program Change				$440K

Literature Cited:
National Marine Fisheries Service and U.S. Fish and Wildlife Service. 2000. Endangered Species Act - Section 7 Consultation Biological Opinion Washington Conservation Reserve Enhancement Program. NMFS Log # WSB-99-462 and USFWS Log # 1-3-F-0064. 118 pp.

Interagency Committee for Outdoor Recreation

Interagency Committee
Salmon Recovery Funding Board
Watershed Health Monitoring Flow Chart



Rounded Boxes are monitoring programs
Square boxes are supporting databases
Costs are expressed as biennial cost

Intensively Monitored Watersheds (IMWs)

The Pacific Coastal Salmon Recovery Fund (PCSRF) federal money administered by NOAA Fisheries and the additional matching state funds has been a pivotal mechanism for funding salmon recovery actions in the Pacific Northwest. Through this program, lead entities, salmon recovery regions, habitat restoration projects, habitat protection projects, assessments, monitoring, and many other aspects of salmon recovery have been funded. The continued flow of money is crucial if we are to be successful in recovering salmon and our watersheds. In keeping with this, the SRFB is increasingly under pressure to justify annual expenditures through NOAA Fisheries to Congress. The Office of Management and Budget (OMB) in 2003 gave the PCSRF program an unsatisfactory score for results/accountability, and gave the overall program a "*Results Not Demonstrated"* finding. Since that date, congressional language has continued to earmark the appropriation with a warning that there are insufficient performance measures and that Congress has "received no assurances that these funds have actually contributed to the recovery of Pacific salmon populations". The federal FY-04 appropriation committee report "directs that two percent of the funding provided through the PCSRF shall be used for validation monitoring".

Although research has shown improvements in specific phases of their life history due to management actions, ultimately cause-effect relationships between management actions and salmon population response must be established to assess the effectiveness of regulatory and restoration actions in

restoring salmon. Development of an approach using IMWs is one means of studying the linkages between management actions and fish production. The SRFB decided to fund four clusters of experimental IMW watersheds in 2004 to demonstrate that the habitat restoration projects funded by the Board were indeed creating more fish in the watersheds. Sufficient numbers of projects are needed in the treatment of watersheds in order to affect the limiting factors being studied and to evoke a response in fish populations.

Results are expected to be available by 2010.

Bien	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	IMWs	Effectiveness	$0K	$0	CMS recommendation
05-07	IMWs	Effectiveness	$2,180K Capital	$0	$2,180K
	Program Change				**$2,180K**

Project Scale Effectiveness Monitoring

The SRFB has funded over 700 projects and expended over $200 million in state and federal funds toward salmon recovery. To determine the effectiveness of these expenditures and in response to Washington's Comprehensive Monitoring Strategy, SRFB staff developed the *"Monitoring and Evaluation Strategy for Implementation Monitoring, Effectiveness Monitoring, Validation Monitoring and Status/Trend Monitoring".* The SRFB approved funding for reach scale effectiveness monitoring in October 2003, and a contract was awarded to Tetra Tech FW, Inc. in April to begin work in the spring of 2004 for selected 2004 (Round 4) and later projects.

Reach scale effectiveness monitoring experimental design and sampling protocols were developed for fish passage, riparian plantings, instream structures, livestock exclusions, constrained channels, reconnected channels, gravel placement, and diversion screening restoration projects. The intent of the monitoring is to test whether habitat targeted for restoration has been improved, and for some projects, to determine whether local stream reach abundance of salmon and steelhead has increased. Where structures (e.g. culverts, livestock fences, fish screens, gabions) are part of habitat improvement, engineering specifications are also tested for effectiveness in meeting design criteria over time.

Monitoring is intended to answer the questions: What categories of restoration projects are most effective in terms of cost effectiveness and longevity? This will assist the SRFB in funding the most effective projects. Preliminary results for some categories will be available in 2007 with all categories completed by 2012.

Bien	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	Restoration Project Monitoring	Effectiveness	$0	$0	CMS recommendation
05-07	Restoration Project Monitoring	Effectiveness	$908K Capital	$0	$908K
	Program Change		**$908K**	**$0**	**$908K**

Implementation/Compliance Monitoring

Implementation monitoring determines whether an action was implemented. It requires simply a yes/no answer and no environmental data. It is usually a low cost monitoring activity. Project monitoring is conducted by SRFB staff for all funded projects.

SRFB/IAC staff may visit each project site one or more times as follows:

- Pre-award visit. Made during the application phase, normally with the applicant.
- While the project is under way.
- When the project is completed.
- Post completion compliance visit. Performed periodically to ensure the site is as described in the Project Agreement.

Staff monitor, in cooperation with the lead entities, 100% of all projects for post completion compliance with:

- Stated project objectives
- Project design criteria
- Contract provisions
- Costs and cost overrun

Reporting of implemented projects is conducted through the PRISM database. Staff project managers, upon completion of the project and inspection, complete data entry in the PRISM system. This allows printed reports of various kinds detailing the percentage of projects completed and any notes or problems associated with the projects.

SRFB employs a staff of five biologists to administer and inspect projects. Approximately 15% of staff time is utilized to monitor project compliance at an annual cost of $68,000.

Lead entities monitor their projects until they are completed and thereafter to determine if maintenance is needed for certain kinds of projects. Costs vary from project to project and may or may not be a component of the SRFB contract

Bien	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	SRFB Grant Monitoring	Implementation	$68K Capital	$68K Capital	$136K
05-07	SRFB Grant Monitoring	Implementation	$68K Capital	$68K Capital	$136K
	Program Change		**$0K**	**$0K**	**$0K**

PRISM Database

PRISM is the Project Information System used by all IAC/SRFB staff as well as constituents statewide to manage grant applications and funded projects and to report progress in meeting salmon recovery goals to Congress and the Legislature. PRISM is also used to track Government Management Accountability and Performance (GMAP) metrics for reporting to the Director and the Governor. All phases of the grant process have been automated in PRISM beginning with applicants submitting their applications on-line and continuing with the grant evaluation process and producing contracts for successful applicants. Once the contract is signed, agency staff uses PRISM to manage projects, track milestones, produce reports, letters and billings, document site inspections, close out grants and track compliance monitoring. Because PRISM is so efficient, each grant manager at IAC handles in excess of 100 active grants.

Project applicants for parks, trails, boating, ORV, horse trails, shooting ranges, habitat restoration projects, habitat acquisition projects, habitat assessments, and others use PRISM. Legislative staff, public and other government entities wishing to track outdoor recreation and habitat projects can access online. National Marine Fisheries Service uses these data to report to Congress on progress made by Washington in salmon recovery. IAC must download all required metrics quarterly.

In 2006, the IAC contracted with the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) to create within PRISM a partitioned firewall that would allow PSNERP data managers access to potential future estuarine-nearshore restoration projects stored in PRISM. This has allowed PSNERP to have the features offered by PRISM at a modest cost.

In 2006, the IAC has begun to upgrade PRISM architecture from its old Visual Basic 6 platform to .Net. PRISM is a geospatially referenced database capable of producing maps with project data points and some overlays such as major roads and streams.

In 2006, the IAC received funding from the Legislature to upgrade the GIS system to produce two-dimensional polygons as part of mapping capabilities. This will allow future delineation of property lines for habitat acquisitions and stream reaches where habitat restoration actions have taken place. Also, additional overlays are anticipated such as orthophoto.

The PRISM database system is mission critical. The IAC office administers hundreds of grant applications per year and tracks thousands of older grants for compliance. Current staff of grant managers can only keep up with the workload as a result of PRISM. PRISM is critical to proper accountability for state and federal investments in habitat and outdoor recreation facilities and lands.

Bien	Program	Monitoring	State Dollars	Fed/Local Dollars	Total
01-03	PRISM maintenance	Database	$500K Capital	$0 Capital	$500K
05-07	PRISM maintenance	Database	$500K Capital	$0 Capital	$500K
05-07	PRISM architecture upgrade		$300K	$70K	$350K
05-07	GIS upgrade		$360K	$0	$360K
	Program Change		**$660K**	**$70K**	**$710K**

Appendix 1. Department of Ecology Monitoring Program and Database Survey Sheets

Stream Flow Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Monitoring Program Name**	**Stream Flow Monitoring Program**
3	**Contact**	Brad Hopkins - 360-407-6686 - bhop461@ecy.wa.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Ecology/Environmental Assessment Program/ Stream Hydrology Unit
6	**Purpose of the monitoring program including monitoring questions being answered**	To measure stream flow in fresh water rivers and streams in the State of Washington. Measure and evaluate seasonal and long-term (inter-annual) temporal patterns in stream flow for salmon recovery and watershed planning purposes; compare actual stream flows to in-stream flow targets; provide near real-time stream flow data via the Web to improve knowledge of stream flows and facilitate near real-time decision making in regard to stream flow management; support TMDL development and implementation, and provide data to inform water quality assessments including determination of water quality violations.
7	**Audience/customer/user**	The public, legislature, state, federal and local officials, private consultants, scientists from government, private, and academic institutions.
8	**Authority**	RCW 90.48.260; 90.70.055; 90.70.060; 90.70.065 ESSB 6153
9	**Relates to watershed health and salmon recovery**	Directly Supports
10	**Date monitoring program began or ended?**	Yes
11	**Type of monitoring**	Coarse Inventory; Effectiveness; Status Monitoring
12	**Monitoring design**	
13	**Primary geographic focus**	Statewide
14	**Geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Lower Columbia; Middle Columbia; NE Washington; Non Salmon Recovery Areas; Puget Sound; Snake River; Upper Columbia; Washington Coast
17	**Frequency of sample collection**	Continuous
18	**What data are collected at sample sites?**	Hydrology
19	**Monitoring Program biennial cost and fund sources**	$1,051,000 (GF-S), $842,000 (Water Quality Account), $161,000 (federal)
20	**What is the name of the database(s) where these monitoring data reside?**	Hydron – Stream Hydrology Database
21	**How often do you analyze, summarize, compile raw data?**	Annually; As Needed; Daily; Monthly
22	**Report/publish data?**	Annually; Daily
23	**Analyzed/summarized data made available?**	Email; Web Downloadable; Web Requested; Web Viewable
24	**What is URL?**	www.ecy.wa.gov/programs/eap/flow/shu_main.html www.ecy.wa.gov/pubs.shtm
25	**Do other agencies collect data for this monitoring program? If so whom?**	No
26	**Data readily available on maps?**	Partial
27	**Data exist as GIS coverage?**	Yes
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes, used by local and state agencies for water management decisions and watershed planning, and provides data for establishing instream flows.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Supports core business functions including setting instream flows, managing water resources, and measuring effectiveness of water resource management programs

Well Log Imaging Monitoring

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Database**	**Well Log Imaging System (Intranet/Web Access to Well Log Data and Images)**
3	**Contact**	Ed Young - 360-407-6644 - eyou461@ecy.wa.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Water Resources Program
6	**Purpose of the monitoring program including monitoring questions being answered**	This system provides ways to search for, find, view, print, send and save water well reports and images. Both GIS navigation and text search pages are built in. They produce lists of well logs within user-defined geographic areas or according to user-defined search criteria (including geographic, depth, diameter, township, section range, address, well tag ID, etc.) Users can view the images of well reports and see the geographic location of the well on the map. The system includes the ability to input new well log data and images and modify existing ones. The user does everything through the web browser using a common look and feel. Updates can be done from each of four regional offices and from headquarters at scan stations. The updates are instantly available statewide from any PC on the Ecology wide area network. Provide on-line Intranet Web access to all available well log data and images via the web. The next phase is to provide Internet access and additional feature enhancements. The greatest need is funding for data cleaning so the information is not only the most accurate available, but also capable of integrating with other agency and regional well monitoring systems.
7	**Audience/customer/user**	The initial audience is Ecology staff statewide via Wide Area Network. The next phase will allow internet access to a wide audience of users.
8	**Authority**	RCW 18.104.050
9	**Relates to watershed health and salmon recovery**	Indirectly Supports
10	**Date monitoring program began or ended?**	Database put into production in Dec/1999.
11	**Type of monitoring**	Coarse Inventory
12	**Monitoring design**	
13	**Primary geographic focus**	Statewide
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Lower Columbia; Middle Columbia; NE Washington; Non Salmon Recovery Areas; Puget Sound; Snake River; Upper Columbia; Washington Coast
17	**Frequency of sample collection**	Continuous
18	**What data are collected at sample sites?**	Ground Water Quality/Quantity
19	**Monitoring Program biennial cost and fund sources**	Biennial cost approx $100,000 – Rec Revolving fund
20	**What is the name of the database(s) where these monitoring data reside?**	Well Log Imaging System
21	**How often do you analyze, summarize, compile raw data?**	Daily
22	**Report/publish data?**	As Needed
23	**Analyzed/summarized data made available?**	Weekly
24	**What is URL?**	http://apps.ecy.wa.gov/welllog/
25	**Do other agencies collect data for this monitoring program? If so whom?**	Occasionally state health dept will gather well log construction data.
26	**Data readily available on maps?**	Yes

27	**Data exist as GIS coverage?**	Yes
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes – local county health depts. use the information for issuance of building permits.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High – We have a number of stakeholders outside of the agency that use this data for analysis and decision making. Stakeholders include: realtors, state health dept, local county health depts., USGS, students, well drillers, well drilling companies, property owners.

Flow Compliance Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Monitoring Program Name**	**Flow Compliance Monitoring**
3	**Contact**	
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	
6	**Purpose of the monitoring program including monitoring questions being answered**	Monitors instream flow compliance and metering compliance. Are water purveyors complying with allowable water withdrawals?
7	**Audience/customer/user**	
8	**Authority**	RCW 43.231A.080, 90.22, 90.54, 90.82, 77.5
9	**Relates to watershed health and salmon recovery**	
10	**Date monitoring program began or ended?**	
11	**Type of monitoring**	Compliance
12	**Monitoring design**	
13	**Primary geographic focus**	
14	**Are monitoring sites geospatially referenced?**	
15	**Does monitoring program provide data with known precision and certainty?**	
16	**Salmon Recovery Region(s)**	
17	**Frequency of sample collection**	
18	**What data are collected at sample sites?**	
19	**Monitoring Program biennial cost and fund sources**	$632,000
20	**What is the name of the database(s) where these monitoring data reside?**	
21	**How often do you analyze, summarize, compile raw data?**	
22	**Report/publish data?**	
23	**Analyzed/summarized data made available?**	
24	**What is URL?**	
25	**Do other agencies collect data for this monitoring program? If so whom?**	
26	**Data readily available on maps?**	
27	**Data exist as GIS coverage?**	
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	

Instream Flow Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Monitoring Program Name**	**Instream Flow Habitat Monitoring**
3	**Contact**	
4	**Program described in CMS survey?**	yes
5	**What department or division is it under?**	
6	**Purpose of the monitoring program including monitoring questions being answered**	Monitors flow to set instream flow requirements. What are the minimum flows needed to maintain fish and other aquatic life?
7	**Audience/customer/user**	
8	**Authority**	
9	**Relates to watershed health and salmon recovery**	
10	**Date monitoring program began or ended?**	
11	**Type of monitoring**	
12	**Monitoring design**	
13	**Primary geographic focus**	
14	**Are monitoring sites geospatially referenced?**	
15	**Does monitoring program provide data with known precision and certainty?**	
16	**Salmon Recovery Region(s)**	
17	**Frequency of sample collection**	
18	**What data are collected at sample sites?**	
19	**Monitoring Program biennial cost and fund sources**	
20	**What is the name of the database(s) where these monitoring data reside?**	
21	**How often do you analyze, summarize, compile raw data?**	
22	**Report/publish data?**	
23	**Analyzed/summarized data made available?**	
24	**What is URL?**	
25	**Do other agencies collect data for this monitoring program? If so whom?**	
26	**Data readily available on maps?**	
27	**Data exist as GIS coverage?**	
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	`
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	

Walla Walla Stream Flow Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Monitoring Program Name**	**Walla Walla Streamflow Monitoring**
3	**Contact**	John Covert - 360-329-3539 - jcov461@ecy.wa.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Water Resources Program ERO
6	**Purpose of the monitoring program including monitoring questions being answered**	Working with WDFW to monitor low-flow streamflow conditions at nine sites within the Walla Walla Watershed.
7	**Audience/customer/user**	WDFW grant
8	**Authority**	90.54
9	**Relates to watershed health and salmon recovery**	Directly Supports
10	**Date monitoring program began or ended?**	Summer 1998
11	**Type of monitoring**	Status Monitoring
12	**Monitoring design**	
13	**Primary geographic focus**	Select Reaches in Walla Walla Watershed
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Snake River
17	**Frequency of sample collection**	Continuous
18	**What data are collected at sample sites?**	Hydrology and water temperature
19	**Monitoring Program biennial cost and fund sources**	Minimal cost absorbed in watershed assistance funding
20	**What is the name of the database(s) where these monitoring data reside?**	Excel spreadsheets
21	**How often do you analyze, summarize, compile raw data?**	As Needed
22	**Report/publish data?**	Annually
23	**Analyzed/summarized data made available?**	Email
24	**What is URL?**	
25	**Do other agencies collect data for this monitoring program? If so whom?**	WDFW
26	**Data readily available on maps?**	Yes for site locations
27	**Data exist as GIS coverage?**	Yes for site locations
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	WDFW
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Low, Provides baseline data to determine if trust water is being protected within the watershed.

Freshwater Ambient Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Monitoring Program Name**	**Long-term Freshwater River and Stream Ambient Monitoring Program**
3	**Contact**	Rob Plotnikoff - 360-407-6687 - rplo461@ecy.wa.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Ecology/Environmental Assessment Program/Environmental Monitoring and Trends Section
6	**Purpose of the monitoring program including monitoring questions being answered**	To assess water quality of fresh water rivers and streams in the State of Washington.
7	**Audience/customer/user**	The public, legislature, state, federal, and local officials, private consultants, scientists from government, private and academic institutions
8	**Authority**	RCW 90.48.260; 90.70.055; 90.70.060; 90.70.065
9	**Relates to watershed health and salmon recovery**	Directly Supports
10	**Date monitoring program began or ended?**	Yes October 1959 - present
11	**Type of monitoring**	Coarse Inventory; Effectiveness; Status Monitoring
12	**Monitoring design**	
13	**Primary geographic focus**	Statewide
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Lower Columbia; Middle Columbia; NE Washington; Non Salmon Recovery Areas; Puget Sound; Snake River; Upper Columbia; Washington Coast
17	**Frequency of sample collection**	Monthly
18	**What data are collected at sample sites?**	Biological - other; Freshwater Surface Water Quality; Instream Habitat
19	**Monitoring Program biennial cost and fund sources**	$523,000 (GF-S), $498,000 (Federal), $80,000 (WQPF)
20	**What is the name of the database(s) where these monitoring data reside?**	17
21	**How often do you analyze, summarize, compile raw data?**	Annually; Monthly
22	**Report/publish data?**	Annually; Monthly
23	**Analyzed/summarized data made available?**	Email; Web Downloadable; Web Requested; Web Viewable www.ecy.wa.gov/programs/eap/fw_riv/rv_main.html www.ecy.wa.gov/pubs.shtm
24	**What is URL?**	No
25	**Do other agencies collect data for this monitoring program? If so whom?**	This Program collects data for WA DNR
26	**Data readily available on maps?**	Yes
27	**Data exist as GIS coverage?**	Yes
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Ongoing
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High; data used as a component of water quality permit preparation, in development of TMDL models, and for evaluating effectiveness of water quality permit requirements.

Freshwater Ambient Monitoring Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Database**	**Long-term Freshwater River and Stream Ambient Monitoring Database**
3	**Database acronym**	
4	**Provide an overview of the data content in this database**	Assess water quality of fresh water rivers and streams in the State of Washington. Used by the public, legislature, state, federal, and local officials, private consultants, scientists from government, private and academic institutions.
5	**Provide the name of the monitoring program(s) this database supports**	Freshwater River and Stream Monitoring Program
6	**Are there other databases that contain the same information? If so, which databases?**	Yes (Environmental Information Management – EIM; once uploaded from the working data management system used in this monitoring program)
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	Monthly
11	**Number of years database has been in operation?**	1975-present
12	**Does this database contain metadata describing content?**	Yes
13	**Where is this database located?**	Department of Ecology Server; http://www.ecy.wa.gov/programs/eap/fw_riv/rv_main.html
14	**What is the basic architecture of the database**	Micrososft Access; key fields linking definition and data tables
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary?**	No; Public Domain
17	**Raw data made available?**	Yes
18	**Data contact person**	Dave Hallock; 360.407.6681 daha461@ecy.wa.gov
19	**Does this database generate reports? If so, what kind of reports**	Station Descriptions; Water Quality interpretations; data graphs for water/air temperature and/or water quality; trend analysis
20	**Analyzed/summarized data made available?**	Yes; Annual Water Year Reports on-line and in hard copy
21	**Who uses this database?**	Private, state, federal, tribes, non-profits
22	**Does Database generate maps?**	No
23	**Data exist as GIS coverage?**	Yes
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$61,000 (GF-S)
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Dedicated
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High; primary point for easy access to statewide water quality information in readable and useable file format; complex water quality information interpreted for ease of use.

WEMAP Marine Water Quality Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Monitoring Program Name**	**Environmental Monitoring and Assessment Program – West Coast Pilot**
3	**Contact**	Valerie Partridge - 360-407-7217 vpar461@ecy.wa.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Ecology/Environmental Assessment Program/Environmental Monitoring and Trends Section/Coastal and Estuarine Assessment Unit
6	**Purpose of the monitoring program including monitoring questions being answered**	The coastal component of Western EMAP applies EMAP's monitoring and assessment tools to create an integrated and comprehensive coastal monitoring program along the west coast. Water column measurements are combined with information about sediment characteristics and chemistry, benthic organisms, and data from fish trawls to describe the current estuarine condition.
7	**Audience/customer/user**	Those interested in coastal/estuarine conditions of Washington, the West Coast, and nationwide.
8	**Authority**	EPA – grant funded
9	**Relates to watershed health and salmon recovery**	Available data support watershed health, salmon recovery, and other related programs.
10	**Date monitoring program began or ended?**	1999
11	**Type of monitoring**	Probabilistic
12	**Monitoring design**	Spatial
13	**Primary geographic focus**	Marine Waters
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Puget Sound; Washington Coast
17	**Frequency of sample collection**	Annually
18	**What data are collected at sample sites?**	Marine/Estuarine Water Quality; Nearshore
19	**Monitoring Program biennial cost and fund sources**	No longer being funded.
20	**What is the name of the database(s) where these monitoring data reside?**	EMAP Data Directory
21	**How often do you analyze, summarize, compile raw data?**	Raw data compiled annually; analyzed and summarized according to EPA contract requirements.
22	**Report/publish data?**	According to EPA contract requirements.
23	**Analyzed/summarized data made available?**	Limited data available through EMAP data directory
24	**What is URL?**	http://www.epa.gov/emap/html/data.html
25	**Do other agencies collect data for this monitoring program? If so whom?**	Yes, see EMAP program home page - http://www.epa.gov/emap/index.html
26	**Data readily available on maps?**	Some
27	**Data exist as GIS coverage?**	No
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes, data are used by EPA to compile National Coastal Condition Reports - http://www.epa.gov/owow/oceans/nccr/. Data available for use in compiling EPA-mandated 303d list and 305b reports.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Not necessary – Ecology is no longer participating in the Coastal EMAP Program because EPA funding was insufficient and similar work was being conducted under the Puget Sound Ambient Monitoring Program's long term sediment monitoring program (except coastal estuary sampling).

Marine Waters Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Monitoring Program Name**	**Marine Waters Monitoring Program**
3	**Contact**	Brian Grantham - 360-407-7444 - bgra461@ecy.wa.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Ecology/Environmental Assessment Program/Environmental Monitoring and Trends Section/Coastal and Estuarine Assessment Unit
6	**Purpose of the monitoring program including monitoring questions being answered**	To assess current status and long term trends in the quality of marine waters in Washington State.
7	**Audience/customer/user**	The public, legislature, state, federal, and local officials, private consultants, scientists from government, private and academic institutions
8	**Authority**	RCW 90.48.260; 90.70.055; 90.70.060; 90.70.065
9	**Relates to watershed health and salmon recovery**	Directly Supports
10	**Date monitoring program began or ended?**	1973
11	**Type of monitoring**	Long term fixed stations.
12	**Monitoring design**	Targeted sampling locations.
13	**Primary geographic focus**	Marine Waters of Puget Sound, Grays, Harbor, Willapa Bay
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Puget Sound; Washington Coast
17	**Frequency of sample collection**	Monthly, 15 minutes at mooring stations
18	**What data are collected at sample sites?**	Monthly sampling - Temperature, Conductivity, chlorophyll-a fluorescence, pH, light transmission, dissolved oxygen, nutrients, fecal coliform, weather and ocean conditions. Moored instruments – Temperature, conductivity, chlorophyll-a or dissolved oxygen.
19	**Monitoring Program biennial cost and fund sources**	$877,000 (GF-S), $183,000 (federal)
20	**What is the name of the database(s) where these monitoring data reside?**	Coastal and Estuarine Assessment Unit marine waters database; Ecology Environmental Information Management System (EIM).
21	**How often do you analyze, summarize, compile raw data?**	Raw data are compiled monthly/quarterly depending on data type. Annually. Analyses and summaries will be done annually.
22	**Report/publish data?**	Annually
23	**Analyzed/summarized data made available?**	Real time and some archived data are web accessible. Older data are available by email.
24	**What is URL?**	http://www.ecy.wa.gov/programs/eap/mar_wat/mwm_intr.html
25	**Do other agencies collect data for this monitoring program? If so whom?**	No
26	**Data readily available on maps?**	No
27	**Data exist as GIS coverage?**	No
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes, data used by Ecology water quality program to develop 303d list and 305b report. Washington Department of Health Shellfish Program uses fecal coliform data in determining status of shellfish beds (open/closed for harvest).
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission critical – supports EPA mandate to monitor WA state's marine waters and provides data for development of 303d list and 305b report. Only source of data for assessing effectiveness of management decisions in many marine areas. Critical for assessing the effects of human impacts and climate change on Washington's marine waters.

Marine Waters Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	Organization	Washington State Department of Ecology
2	Database	Marine Waters Database
3	Database acronym	
4	Provide an overview of the data content in this database	
5	Provide the name of the monitoring program(s) this database supports	
6	Are there other databases that contain the same information? If so, which databases?	
7	Is this database specifically identified by statute? What statute?	
8	Is this database active?	
9	Geospatially referenced?	
10	Frequency of data entry	
11	Number of years database has been in operation?	
12	Does this database contain metadata describing content?	
13	Where is this database located?	
14	What is the basic architecture of the database	
15	Charge money for the data?	
16	Data sensitive or proprietary?	
17	Raw data made available?	
18	Data contact person	
19	Does this database generate reports? If so, what kind of reports	
20	Analyzed/summarized data made available?	
21	Who uses this database?	
22	Does Database generate maps?	
23	Data exist as GIS coverage?	
24	What is the biennial cost to operate and maintain this database? What are the fund sources?	
25	Are these funds dedicated or short term project funding? If short term, when will funding terminate?	
26	How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?	

Marine Sediment Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Monitoring Program Name**	**Marine Sediment Monitoring Program**
3	**Contact**	Maggie Dutch - 360-407-6021 - mdut461@ecy.wa.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Ecology/Environmental Assessment Program/Environmental Monitoring and Trends Section/Coastal and Estuarine Assessment Unit
6	**Purpose of the monitoring program including monitoring questions being answered**	Assess current status and long term trends in the quality of marine sediments in Puget Sound. Develop baselines for chemistry, toxicity, and invertebrate diversity in Puget Sound sediments.
7	**Audience/customer/user**	The public, legislature, state, federal, and local officials, private consultants, scientists from government, private and academic institutions.
8	**Authority**	RCW 90.48.260; 90.70.055; 90.70.060; 90.70.065
9	**Relates to watershed health and salmon recovery**	Directly supports
10	**Date monitoring program began or ended?**	1989
11	**Type of monitoring**	Spatial and temporal
12	**Monitoring design**	Spatial – probabilistic; temporal – stations representative of Puget Sound
13	**Primary geographic focus**	Puget Sound
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Puget Sound,
17	**Frequency of sample collection**	Spatial sampling – 10 year rotation through Puget Sound. Temporal - annual
18	**What data are collected at sample sites?**	Sediment chemistry (), sediment toxicity, sediment infaunal invertebrate community composition, total organic carbon, sediment grain size
19	**Monitoring Program biennial cost and fund sources**	$430,000 (GF-S), $182,000 (federal), $418,000 State Toxics Account).
20	**What is the name of the database(s) where these monitoring data reside?**	Ecology's Sediment Quality Information System (SedQual) and Environmental Information Management (EIM) system.
21	**How often do you analyze, summarize, compile raw data?**	Annually
22	**Report/publish data?**	Annually
23	**Analyzed/summarized data made available?**	Yes, in technical reports and short general readership reports.
24	**What is URL?**	http://www.ecy.wa.gov/programs/eap/mar_sed/msm_intr.html
25	**Do other agencies collect data for this monitoring program? If so whom?**	No
26	**Data readily available on maps?**	No
27	**Data exist as GIS coverage?**	Yes
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes, data used by Ecology water quality program to develop 303d list and 305b report , Ecology Toxics Control Program to assess the need for toxics remediation plans, Washington State Department of Fish and Wildlife for analysis of the distribution of toxics in Puget Sound fish.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission critical – supports EPA mandate to monitor WA state's marine waters and provides data for development of 303d list and 305b report. Only source of data for assessing effectiveness of management decisions in many marine areas. Provides baseline data to gage need for, and effectiveness of, sediment cleanup programs.

Marine Sediments Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Database**	**Marine Sediments Database**
3	**Database acronym**	Ecology's Sediment Quality Information System (SedQual)
4	**Provide an overview of the data content in this database**	
5	**Provide the name of the monitoring program(s) this database supports**	
6	**Are there other databases that contain the same information? If so, which databases?**	
7	**Is this database specifically identified by statute? What statute?**	
8	**Is this database active?**	
9	**Geospatially referenced?**	
10	**Frequency of data entry**	
11	**Number of years database has been in operation?**	
12	**Does this database contain metadata describing content?**	
13	**Where is this database located?**	
14	**What is the basic architecture of the database**	
15	**Charge money for the data?**	
16	**Data sensitive or proprietary?**	
17	**Raw data made available?**	
18	**Data contact person**	
19	**Does this database generate reports? If so, what kind of reports**	
20	**Analyzed/summarized data made available?**	
21	**Who uses this database?**	
22	**Does Database generate maps?**	
23	**Data exist as GIS coverage?**	
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	

Impaired Waters Compliance Monitoring

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Monitoring Program Name**	**Impaired Waters Compliance Monitoring**
3	**Contact**	
4	**Program described in CMS survey?**	yes
5	**What department or division is it under?**	
6	**Purpose of the monitoring program including monitoring questions being answered**	Every two years the Department compiles a list of impaired waters that do not meet the Clean Water Act standards. Sample site selection is based on a five year statewide rotating schedule What is the status/trend of impaired waters that do not meet the Clean Water Act standards?
7	**Audience/customer/user**	
8	**Authority**	
9	**Relates to watershed health and salmon recovery**	
10	**Date monitoring program began or ended?**	
11	**Type of monitoring**	
12	**Monitoring design**	
13	**Primary geographic focus**	
14	**Are monitoring sites geospatially referenced?**	
15	**Does monitoring program provide data with known precision and certainty?**	
16	**Salmon Recovery Region(s)**	
17	**Frequency of sample collection**	
18	**What data are collected at sample sites?**	
19	**Monitoring Program biennial cost and fund sources**	$10,250,000
20	**What is the name of the database(s) where these monitoring data reside?**	
21	**How often do you analyze, summarize, compile raw data?**	
22	**Report/publish data?**	
23	**Analyzed/summarized data made available?**	
24	**What is URL?**	
25	**Do other agencies collect data for this monitoring program? If so whom?**	
26	**Data readily available on maps?**	
27	**Data exist as GIS coverage?**	
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	

Toxic Pollution Studies Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Monitoring Program Name**	**Toxic Pollution Studies**
3	**Contact**	Will Kendra - 360-407-6698 - wken461@ecy.wa.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Environmental Assessment Program
6	**Purpose of the monitoring program including monitoring questions being answered**	Monitor and assess water, sediment, soil, and fish/shellfish tissue statewide to determine toxic pollutant burdens. Monitor source and environmental fate of toxicants released into the environment; recommend management strategies for toxic pollution control.
7	**Audience/customer/user**	Citizens and their legislative representatives, state and local government officials, business and environmental interest groups, tribes, and US Environmental Protection Agency.
8	**Authority**	RCW 90.48.260; USC 33.1254
9	**Relates to watershed health and salmon recovery**	Directly Supports
10	**Date monitoring program began or ended?**	Ongoing since mid-1980s
11	**Type of monitoring**	Effectiveness; Status Monitoring
12	**Monitoring design**	Varied
13	**Primary geographic focus**	Statewide
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Depends on monitoring objectives.
16	**Salmon Recovery Region(s)**	Lower Columbia; Middle Columbia; NE Washington; Non Salmon Recovery Areas; Puget Sound; Snake River; Upper Columbia; Washington Coast
17	**Frequency of sample collection**	Episodic to annual
18	**What data are collected at sample sites?**	Freshwater Surface Water Quality; Marine/Estuarine Water Quality; toxics in edible fish tissue and aquatic sediments
19	**Monitoring Program biennial cost and fund sources**	$305,000 (GF-S), $671,000 (federal), $605,000 (State Toxics Account), $699,000 (WQPF)
20	**What is the name of the database(s) where these monitoring data reside?**	Environmental Information Management System (Ecology database)
21	**How often do you analyze, summarize, compile raw data?**	As Needed
22	**Report/publish data?**	As Needed
23	**Analyzed/summarized data made available?**	Email; Hard Copy; Web Downloadable
24	**What is URL?**	http://www.ecy.wa.gov/pubs.shtm; http://www.ecy.wa.gov/eim/
25	**Do other agencies collect data for this monitoring program? If so whom?**	No
26	**Data readily available on maps?**	Yes, via EIM database http://www.ecy.wa.gov/eim/
27	**Data exist as GIS coverage?**	Yes, via EIM database http://www.ecy.wa.gov/eim/
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes, Washington Department of Health for assessing human health consumption risks for toxics in edible fish tissue; these data are their primarily basis for issuing fish consumption advisories in WA State.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission critical – it is the only monitoring program the state has for toxic pollutants in freshwaters.

Toxic Pollution Studies database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	Organization	Washington State Department of Ecology
2	Database	Toxic Pollution Studies Database
3	Database acronym	
4	Provide an overview of the data content in this database	
5	Provide the name of the monitoring program(s) this database supports	
6	Are there other databases that contain the same information? If so, which databases?	
7	Is this database specifically identified by statute? What statute?	
8	Is this database active?	
9	Geospatially referenced?	
10	Frequency of data entry	
11	Number of years database has been in operation?	
12	Does this database contain metadata describing content?	
13	Where is this database located?	
14	What is the basic architecture of the database	
15	Charge money for the data?	
16	Data sensitive or proprietary?	
17	Raw data made available?	
18	Data contact person	
19	Does this database generate reports? If so, what kind of reports	
20	Analyzed/summarized data made available?	
21	Who uses this database?	
22	Does Database generate maps?	
23	Data exist as GIS coverage?	
24	What is the biennial cost to operate and maintain this database? What are the fund sources?	
25	Are these funds dedicated or short term project funding? If short term, when will funding terminate?	
26	How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?	

TMDL Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Monitoring Program Name**	**Total Maximum Daily Load Studies**
3	**Contact**	Will Kendra - 360-407-6698 - wken461@ecy.wa.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Environmental Assessment Program
6	**Purpose of the monitoring program including monitoring questions being answered**	Monitor and assess state surface waters to determine pollutant load reductions needed to achieve compliance with state water quality standards. Monitor pollutant loading and fate in impaired surface waters; estimate assimilative capacity of receiving waters for pollutant loading; recommend pollutant load reductions needed to achieve water quality standards.
7	**Audience/customer/user**	Citizens and their legislative representatives, state and local government officials, business and environmental interest groups, tribes, and US Environmental Protection Agency.
8	**Authority**	RCW 90.48.260; USC 33.1313
9	**Relates to watershed health and salmon recovery**	Directly Supports
10	**Date monitoring program began or ended?**	Ongoing since late 1980s
11	**Type of monitoring**	Source & fate; Effectiveness
12	**Monitoring design**	Varied
13	**Primary geographic focus**	Statewide
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Depends on monitoring objectives
16	**Salmon Recovery Region(s)**	Lower Columbia; Middle Columbia; NE Washington; Non Salmon Recovery Areas; Puget Sound; Upper Columbia; Washington Coast
17	**Frequency of sample collection**	Episodic
18	**What data are collected at sample sites?**	Freshwater Surface Water Quality; Marine/Estuarine Water Quality
19	**Monitoring Program biennial cost and fund sources**	2.1 million dollars in general fund state, state toxics control account, water quality permit fees, and federal grants
20	**What is the name of the database(s) where these monitoring data reside?**	Environmental Information Management System (Ecology database)
21	**How often do you analyze, summarize, compile raw data?**	As Needed
22	**Report/publish data?**	As Needed
23	**Analyzed/summarized data made available?**	Email; Hard Copy; Web Downloadable
24	**What is URL?**	http://www.ecy.wa.gov/pubs.shtm; http://www.ecy.wa.gov/eim/
25	**Do other agencies collect data for this monitoring program? If so whom?**	No
26	**Data readily available on maps?**	Yes, via EIM database http://www.ecy.wa.gov/eim/
27	**Data exist as GIS coverage?**	Yes, via EIM database http://www.ecy.wa.gov/eim/
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes, decisions regarding pollution control strategies to clean up the state's waters.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission critical – it is the only TMDL monitoring program the state has for conventional pollutants.

TMDL Studies Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Database**	**Total Maximum Daily Load Studies Database**
3	**Database acronym**	
4	**Provide an overview of the data content in this database**	Database maintained for monitoring and assessing state surface waters to determine pollutant load reductions needed to achieve compliance with state water quality standards.
5	**Provide the name of the monitoring program(s) this database supports**	
6	**Are there other databases that contain the same information? If so, which databases?**	
7	**Is this database specifically identified by statute? What statute?**	
8	**Is this database active?**	No, all data in this system has been migrated to Ecology's Environmental Information Management System http://www.ecy.wa.gov/eim/
9	**Geospatially referenced?**	
10	**Frequency of data entry**	
11	**Number of years database has been in operation?**	
12	**Does this database contain metadata describing content?**	
13	**Where is this database located?**	
14	**What is the basic architecture of the database**	
15	**Charge money for the data?**	
16	**Data sensitive or proprietary?**	
17	**Raw data made available?**	
18	**Data contact person**	
19	**Does this database generate reports? If so, what kind of reports**	
20	**Analyzed/summarized data made available?**	
21	**Who uses this database?**	
22	**Does Database generate maps?**	
23	**Data exist as GIS coverage?**	
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	

Non-point Pollution Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Database**	**Nonpoint Source Pollution Studies Database**
3	**Database acronym**	
4	**Provide an overview of the data content in this database**	Database maintained for monitoring and assessing effects of nonpoint source pollution on surface and ground waters statewide.
5	**Provide the name of the monitoring program(s) this database supports**	
6	**Are there other databases that contain the same information? If so, which databases?**	
7	**Is this database specifically identified by statute? What statute?**	
8	**Is this database active?**	No, all data in this system has been migrated to Ecology's Environmental Information Management System http://www.ecy.wa.gov/eim/
9	**Geospatially referenced?**	
10	**Frequency of data entry**	
11	**Number of years database has been in operation?**	
12	**Does this database contain metadata describing content?**	
13	**Where is this database located?**	
14	**What is the basic architecture of the database**	
15	**Charge money for the data?**	
16	**Data sensitive or proprietary?**	
17	**Raw data made available?**	
18	**Data contact person**	
19	**Does this database generate reports? If so, what kind of reports**	
20	**Analyzed/summarized data made available?**	
21	**Who uses this database?**	
22	**Does Database generate maps?**	
23	**Data exist as GIS coverage?**	
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	

BEACH Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Monitoring Program Name**	**Beach Environmental Assessment, Communication, and Health (BEACH) Program**
3	**Contact**	Lynn Schneider - 360-407-65431 - lysc461@ecy.wa.gov
4	**Program described in CMS survey?**	No
5	**What department or division is it under?**	Ecology/Environmental Assessment Program/Environmental Monitoring and Trends Section/Coastal and Estuarine Assessment Unit
6	**Purpose of the monitoring program including monitoring questions being answered**	The purpose of the BEACH program is to reduce the risk of disease to users of saltwater beaches. The BEACH Program monitors saltwater swimming beach waters for bacteria that indicate the possibility of pollution from sewage treatment plant problems, boating waste, malfunctioning septic systems, and animal waste. The Program achieves these goals by: • Monitoring bacteria levels at saltwater recreational beaches used by the public. • Managing a notification system to alert s users of saltwater beaches when monitoring results are above threshold limits and when human health or safety is at risk due to a pollution event. • Educating the public about to the risk of illness associated with increased levels of bacteria in recreational waters.
7	**Audience/customer/user**	Saltwater recreational beach users
8	**Authority**	EPA BEACH Act
9	**Relates to watershed health and salmon recovery**	No
10	**Date monitoring program began or ended?**	2003
11	**Type of monitoring**	Bacterial water quality measured at priority marine recreational beaches.
12	**Monitoring Design**	Weekly monitoring of bacteria May - Sept
13	**Primary geographic focus**	Marine Waters
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Not relevant
17	**Frequency of sample collection**	Weekly during May-Sept
18	**What data are collected at sample sites?**	Bacteria
19	**Monitoring Program biennial cost and fund sources**	EPA grant-funded: $550 K
20	**What is the name of the database(s) where these monitoring data reside?**	BEach Advisory and Closing Online Notification system (BEACON)
21	**How often do you analyze, summarize, compile raw data?**	Weekly May-Sept.
22	**Report/publish data?**	Annually
23	**Analyzed/summarized data made available?**	Weekly, annually
24	**What is URL**	http://www.epa.gov/waterscience/beaches/data.html
25	**Do other agencies collect data for this monitoring program? If so whom?**	Yes, local health agencies.
26	**Data readily available on maps?**	Yes
27	**Data exist as GIS coverage?**	Yes
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes, Washington State Department of Health and the local health agencies use these data to determine the need for beach closures, and the WA State Department of Health Shellfish Program uses these data in support of shellfish closures.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Low for Ecology, but high for the Washington State Department of Health, which is a partner in the program.

Stream Biological Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Monitoring Program Name**	**Stream Biological Monitoring (including EMAP Surveys)**
3	**Contacts**	Chad Wiseman 360.407.6682 cwis461@ecy.wa.gov & Glenn Merritt 360.407.6777 gmer461@ecy.wa.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Dept. of Ecology/Environmental Assessment Program/Environmental Monitoring and Trends Section
6	**Purpose of the monitoring program including monitoring questions being answered**	Monitors trend of biological, chemical, and physical indicators in stream locations within each Washington ecoregion. Sites are established reference sites. What is the status biological, chemical, and physical indicators in stream locations of representative sites within each ecoregion?
7	**Audience/customer/user**	Private, state, federal, tribal, non-profits, academic
8	**Authority**	Clean Water Act
9	**Relates to watershed health and salmon recovery**	Yes
10	**Date monitoring program began or ended?**	1993-present
11	**Type of monitoring**	Biological community assessment (aquatic invertebrates and fish), physical habitat, water chemistry
12	**Monitoring design**	"Targeted site selection" and "randomly selected sites";
13	**Primary geographic focus**	Statewide
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	All
17	**Frequency of sample collection**	Annually
18	**What data are collected at sample sites?**	Physical Habitat (channel condition, riparian condition, human activities), surface water chemistry data, aquatic invertebrate samples, fish community survey
19	**Monitoring Program biennial cost and fund sources**	$70,000 (GF-S) $250,000 (Federal grants)
20	**What is the name of the database(s) where these monitoring data reside?**	Freshwater Biological Monitoring Database; http://www.ecy.wa.gov/programs/eap/fw_benth/index.html
21	**How often do you analyze, summarize, compile raw data?**	Annually
22	**Report/publish data?**	Yes
23	**Analyzed/summarized data made available?**	Yes
24	**What is URL?**	http://www.ecy.wa.gov/programs/eap/fw_benth/index.html; http://www.ecy.wa.gov/programs/eap/fw_benth/index.html#publications
25	**Do other agencies collect data for this monitoring program? If so whom?**	No
26	**Data readily available on maps?**	Yes
27	**Data exist as GIS coverage?**	No; sampling locations only
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes; Condition of specific river/stream locations for issuance of permits
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High; used for identifying biological community impairments for 303(d) Listing; evaluating effectiveness of habitat improvement plans;

EIM Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Database**	**Environmental Information Management**
3	**Database acronym**	EIM
4	**Provide an overview of the data content in this database**	Primary data repository for managing environmental monitoring data. This system stores physical, chemical, and biological monitoring data, including geographic location of the station where a sample was collected, detailed project information, and information about the quality of the data. Over a million result records have been input to this system representing over 215 studies and 6,000 locations.
5	**Provide the name of the monitoring program(s) this database supports**	The Environmental Information Management System (EIM) is the Department of Ecology's central database for environmental monitoring data. EIM contains physical, chemical, and biological analysis and measurements. Supplementary information about the data (metadata) is also stored, including information about environmental studies, monitoring locations, and data quality.
6	**Are there other databases that contain the same information? If so, which databases?**	Yes. Sedqual, ambient database, LIMS, and others are sources supply data to EIM but are also separately maintained (Sedqual will be discontinued after it is fully migrated to EIM).
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	Daily
11	**Number of years database has been in operation?**	6
12	**Does this database contain metadata describing content?**	Yes
13	**Where is this database located?**	Lacey Office
14	**What is the basic architecture of the database**	Web interface – SQL Server
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary?**	No
17	**Raw data made available?**	No raw data
18	**Data contact person**	Chris Neumiller
19	**Does this database generate reports? If so, what kind of reports**	Yes. Quarterly reports; maps
20	**Analyzed/summarized data made available?**	Yes
21	**Who uses this database?**	Agencies, private sector, public
22	**Does Database generate maps?**	Yes
23	**Data exist as GIS coverage?**	Yes
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$420,000 (covers on-going application administrator and agency data coordination). Funding provided by state funds derived from agency indirect pool.
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Dedicated
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	This is a mission critical database. It is the central repository for Department of Ecology environmental data.

Hydrography Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Ecology**
2	**Database**	**Hydrography database**
3	**Database acronym**	Clearinghouse
4	**Provide an overview of the data content in this database**	
5	**Provide the name of the monitoring program(s) this database supports**	
6	**Are there other databases that contain the same information? If so, which databases?**	
7	**Is this database specifically identified by statute? What statute?**	
8	**Is this database active?**	
9	**Geospatially referenced?**	
10	**Frequency of data entry**	
11	**Number of years database has been in operation?**	
12	**Does this database contain metadata describing content?**	
13	**Where is this database located?**	
14	**What is the basic architecture of the database**	
15	**Charge money for the data?**	
16	**Data sensitive or proprietary?**	
17	**Raw data made available?**	
18	**Data contact person**	
19	**Does this database generate reports? If so, what kind of reports**	
20	**Analyzed/summarized data made available?**	
21	**Who uses this database?**	
22	**Does Database generate maps?**	
23	**Data exist as GIS coverage?**	
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	

Appendix 2. Department of Natural Resources Monitoring Program and Database Survey Sheets

TFW Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Monitoring Program Name**	**TFW Cooperative Monitoring, Evaluation and Research**
3	**Contact**	Darin Cramer, Adaptive Management Program Administrator Darin.cramer@wadnr.gov 360-902-1088
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Funded through the Forest Practices Division
6	**Purpose of the monitoring program including monitoring questions being answered**	The historic mission of CMER has been to provide information that will help evaluate the TFW Agreement's effectiveness, and offer a framework for adaptive management. With the 2000 rules, CMER was officially charge with research and monitoring to support the adaptive management program. The CMER program was designed to answer questions about how forest practices affect public resources. The CMER program has several key purposes, including: Examining ways in which forestry activities such as timber harvest and road construction impact fish, wildlife and water quality; providing the technical and informational framework for making and evaluating resource management decisions; promoting understanding of ecosystem interactions.
7	**Audience/customer/user**	TFW and Forests and Fish stakeholders include state and federal resource management agencies (WDFW, DNR and Ecology; U.S. Fish and Wildlife Service; National Marine Fisheries Service); large and small private forest landowners, tribal interests; environmental community; and the public.
8	**Authority**	RCW79.09.370(6)
9	**Relates to watershed health and salmon recovery**	Directly Supports
10	**Date monitoring program began or ended?**	Set in rule in 2000. In operation cooperatively since 1987.
11	**Type of monitoring**	Effectiveness, Compliance, Extensive, Validation
12	**Monitoring design**	Varies with study
13	**Primary geographic focus**	Statewide
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Lower Columbia; Middle Columbia; NE Washington; Non Salmon Recovery Areas; Puget Sound; Snake River; Upper Columbia; Washington Coast
17	**Frequency of sample collection**	Varies
18	**What data are collected at sample sites?**	Biological - other; Freshwater Surface Water Quality; Geologic; Ground Water Quality/Quantity; Hydrology; Instream Habitat; Other; Other Upland; Riparian Habitat; Salmonid Passage; Salmonid Productivity; Upland Habitat; Waterway and Channel Modification; Wetlands
19	**Monitoring Program biennial cost and fund sources**	$8,000K GFF PCSRF and $1,200K GFS
20	**What is the name of the database(s) where these monitoring data reside?**	CMER web site under Adaptive Management on the Forest Practices web site
21	**How often do you analyze, summarize, compile raw data?**	Varies
22	**Report/publish data?**	Varies
23	**Analyzed/summarized data made available?**	Yes
24	**What is URL?**	http://www.wadnr.gov:81/forestpractices/adaptivemanagement/
25	**Do other agencies collect data for this monitoring program? If so whom?**	Ecology, Fish & Wildlife
26	**Data readily available on maps?**	Some data are
27	**Data exist as GIS coverage?**	Some data do
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	The Forest and Fish Policy group makes recommendations to the Forest Practices Board about rule changes based on the information generated by the CMER research and monitoring programs.

29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	This program is crucial to adaptive management for the forest practices rules. CMER research and monitoring provides the avenue for adjusting the forest practice rules. RCW76.09370(6)

Hazard Zone Landslide Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Database**	**Hazard Zone Landslide Database**
3	**Database acronym**	LSI
4	**Provide an overview of the data content in this database**	The LSI is a database (inventory) of known landslide locations (events). The Hazone is a database of areas that are known to produce landslide events.
5	**Provide the name of the monitoring program(s) this database supports**	CMER unstable slopes projects are the main monitoring programs that these databases support, however, DNR-Statelands uses this data in their HCP monitoring.
6	**Are there other databases that contain the same information? If so, which databases?**	None known.
7	**Is this database specifically identified by statute? What statute?**	Forest and Fish Legislation (ESHB2091)
8	**Is this database active?**	Yes. Both datasets (LSI &Hazone) are GIS coverages.
9	**Geospatially referenced?**	Yes. Both datasets (LSI &Hazone) are GIS coverages.
10	**Frequency of data entry**	Weekly update with quarterly posting of data to our (Forest PracticesDivision) website.
11	**Number of years database has been in operation?**	Three
12	**Does this database contain metadata describing content?**	Yes. The metadata comes with the data, or can be downloaded separately
13	**Where is this database located?**	Currently, the data is located on Forest Practices Division disks and a copy is put on our website quarterly (www.dnr.wa.gov/forestpractices/data) for public download. In the near future, the data will be placed onto our DNR corporate disk (instead of the FPD disk) as well as downloadable website.
14	**What is the basic architecture of the database**	Currently, these two databases are GIS coverages with associated (related) data files. In the near future, these coverages and related data files will be converted to a Geodatabase (SDE).
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary?**	No
17	**Raw data made available?**	In most cases, where the raw data is available to us and we have permission to distribute it, yes. In some cases, no, as we either do not have the raw data or do not have permission to distribute the raw data.
18	**Data contact person**	Laura Vaugeois - 360-902-1405 - laura.vaugeois@wadnr.gov
19	**Does this database generate reports? If so, what kind of reports**	On it's own, this database does not generate reports, but the data can be mined to produce reports about landslide rates, timing, triggering mechanisms, associated land use, areas in high hazard, an a large variety of other information.
20	**Analyzed/summarized data made available?**	Generally, no, except in peer-reviewed journals.
21	**Who uses this database?**	Land managers, foresters, geologists, planners, office staff who classify forest practice applications and researchers who are interested in landslides.
22	**Does Database generate maps?**	The databases on their own do not generate maps, but since the data comes as GIS coverages, maps can be made using this data.
23	**Data exist as GIS coverage?**	Yes

24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	These databases are in active data collection mode at the moment. As such, we have a team of geologists mapping landslides and landslide hazard areas as well as a cartographer who does the GIS aspects of data entry and maintenance. The current budget is approximately $510,000 a year, with funding coming from Federal Forests and Fish appropriations, administered through the IAC.
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	The funds are short term project funding that are expected to terminate in July of 2007.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	These databases are important (high) for conducting DNR business as they identify what areas on the landscape have had landslides or are prone to having landslides. That information is important for regulatory foresters and office staff who classify forest practices applications to identify the appropriate classification.

Natural Heritage Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Monitoring Program Name**	**Natural Heritage Monitoring**
3	**Contact**	John Gamon, 360-902-1661, john.gamon@wadnr.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	WA Department of Natural Resources, Asset Management and Protection Division
6	**Purpose of the monitoring program including monitoring questions being answered**	Maintain GIS and tabular information on the state's significant ecological features, including rare species and high quality terrestrial and aquatic communities.
7	**Audience/customer/user**	Data are used internally by the Natural Areas Program within DNR, as well as externally by non-profit conservation organizations, other state and federal agencies, consulting firms, researchers, etc. Data are used both directly for conservation planning purposes and indirectly during the course of environmental review of various projects.
8	**Authority**	RCW 79.70
9	**Relates to watershed health and salmon recovery**	Indirectly supports
10	**Date monitoring program began or ended?**	1977 to present
11	**Type of monitoring**	Inventory
12	**Monitoring design**	Varies
13	**Primary geographic focus**	Statewide
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	All
17	**Frequency of sample collection**	No structured monitoring schedule
18	**What data are collected at sample sites?**	Biological - other
19	**Monitoring Program biennial cost and fund sources**	Circa $150-200K. GF-S, GF-F, GF-L, RMCA/FDA
20	**What is the name of the database(s) where these monitoring data reside?**	NHIS (Biotics)
21	**How often do you analyze, summarize, compile raw data?**	Varies
22	**Report/publish data?**	Varies
23	**Analyzed/summarized data made available?**	Viewable on web and by special request
24	**What is URL?**	http://www.dnr.wa.gov/nhp/
25	**Do other agencies collect data for this monitoring program? If so whom?**	Yes: USFS, BLM, Dept. of Ecology
26	**Data readily available on maps?**	No
27	**Data exist as GIS coverage?**	Yes
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes USFS & BLM - rare species management, US FWS, BPA, PUDs, Counties, DOT - species impacts
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Critical to meet RCW 79.70; critical for DNR"s SFI certification.

Natural Heritage Information System Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Database**	**Natural Heritage Information System (aka Biotics)**
3	**Database acronym**	NHIS
4	**Provide an overview of the data content in this database**	Maintain GIS and tabular information on the state's significant ecological features, including rare species and high quality terrestrial and aquatic communities.
5	**Provide the name of the monitoring program(s) this database supports**	Natural Heritage monitoring
6	**Are there other databases that contain the same information? If so, which databases?**	Yes
7	**Is this database specifically identified by statute? What statute?**	RCW 79.70
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	varies
11	**Number of years database has been in operation?**	19
12	**Does this database contain metadata describing content?**	Available separately
13	**Where is this database located?**	Natural Heritage Program, Olympia
14	**What is the basic architecture of the database**	Oracle relational database
15	**Charge money for the data?**	Service fees may apply
16	**Data sensitive or proprietary?**	A portion.
17	**Raw data made available?**	Not Available
18	**Data contact person**	Sandy Moody - 360-902-1667 - Sandra.moody@wadnr.gov
19	**Does this database generate reports? If so, what kind of reports**	Yes. A variety: by species, by location
20	**Analyzed/summarized data made available?**	On web site
21	**Who uses this database?**	Maintain GIS and tabular information on the state's significant ecological features, including rare species and high quality terrestrial and aquatic communities.
22	**Does Database generate maps?**	Yes
23	**Data exist as GIS coverage?**	Yes
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$400K GF-S, GF-F, GF-L, RMCA/FDA
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Variable
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Critical for implementation of RCW 79.70; critical for DNR to meet SFI certification.

Kings Lake Bog Monitoring

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Monitoring Program Name**	**Kings Lake Bog Water Quality and Hydrology Study**
3	**Contact**	David Wilderman - 360-902-1556 - david.wilderman@wadnr.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	DNR
6	**Purpose of the monitoring program including monitoring questions being answered**	Baseline data on water quality and hydrology of Kings Lake Bog Natural Area Preserve. Describe water quality and hydrology of the site.
7	**Audience/customer/user**	Intended to help DNR identify threats to the long-term persistence of the bog and wetland complex.
8	**Authority**	RCW 79.70
9	**Relates to watershed health and salmon recovery**	Indirectly Supports
10	**Date monitoring program began or ended?**	Began 2001
11	**Type of monitoring**	Status-Trend Monitoring
12	**Monitoring design**	Non-random long-term sampling sites
13	**Primary geographic focus**	Select Reaches
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Puget Sound -- WRIA 8
17	**Frequency of sample collection**	Monthly
18	**What data are collected at sample sites?**	Freshwater Surface Water Quality; Water Quantity/Hydrology
19	**Monitoring Program biennial cost and fund sources**	$36,000 GFS
20	**What is the name of the database(s) where these monitoring data reside?**	Reports provided by The Evergreen State College
21	**How often do you analyze, summarize, compile raw data?**	Annually
22	**Report/publish data?**	As Needed
23	**Analyzed/summarized data made available?**	Special Request and Provided Electronically; and Hard Copy
24	**What is URL?**	n/a
25	**Do other agencies collect data for this monitoring program? If so whom?**	No
26	**Data readily available on maps?**	Partial
27	**Data exist as GIS coverage?**	Partial
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	No
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High -- Provides baseline data essential for tracking long-term changes in bog hydrology and chemistry. This information is important in making management decisions for the site.

Hydrography Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Database**	**Hydrography Database**
3	**Database acronym**	WADNR HYDRO
4	**Provide an overview of the data content in this database**	Provides a statewide Geographic Information System (GIS) data layer of surface water features for data analysis and mapping in support of natural resource regulation and management functions including (but not limited to) salmon recovery and watershed health.
5	**Provide the name of the monitoring program(s) this database supports**	These data sets support a wide variety of monitoring programs by providing the surface water base map information.
6	**Are there other databases that contain the same information? If so, which databases?**	no
7	**Is this database specifically identified by statute? What statute?**	RCW 5822, 5824; ESHB 2091; RCW 76.09; WAC 222 Requirements for regulatory and proprietary land management.
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	Varies, but no less than monthly
11	**Number of years database has been in operation?**	14
12	**Does this database contain metadata describing content?**	yes
13	**Where is this database located?**	On the DNR core database and http://www3.wadnr.gov/dnrapp6/dataweb/dmmatrix.html
14	**What is the basic architecture of the database**	Arc/Info
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary?**	No
17	**Raw data made available?**	Download: http://www3.wadnr.gov/dnrapp6/dataweb/dmmatrix.html
18	**Data contact person**	Mac McKay, WADNR Hydrography Data Steward (902-1453 or mac.mckay@wadnr.gov)
19	**Does this database generate reports? If so, what kind of reports**	no
20	**Analyzed/summarized data made available?**	no
21	**Who uses this database?**	WA Department of Natural Resources staff, Timber/Fish/Wildlife participants and other state/federal/private agencies/organizations/individuals.
22	**Does Database generate maps?**	Yes
23	**Data exist as GIS coverage?**	Yes
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	Operation and maintenance of this data layer is part of our base level General Fund – State budget. We estimate the biennial cost to be approximately $300,000.
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Funding is allocated from “current level” General Fund – State budget.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High

HCP Compliance Monitoring

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Monitoring Program Name**	**HCP - Compliance Monitoring Program**
3	**Contact**	
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Dept. of Natural Resources,
6	**Purpose of the monitoring program including monitoring questions being answered**	
7	**Audience/customer/user**	
8	**Authority**	
9	**Relates to watershed health and salmon recovery**	Directly Supports
10	**Date monitoring program began or ended?**	
11	**Type of monitoring**	Compliance monitoring
12	**Monitoring design**	
13	**Primary geographic focus**	Statewide state forest lands
14	**Are monitoring sites geospatially referenced?**	
15	**Does monitoring program provide data with known precision and certainty?**	
16	**Salmon Recovery Region(s)**	Lower Columbia; Middle Columbia; NE Washington; Non Salmon Recovery Areas; Puget Sound; Snake River; Upper Columbia; Washington Coast
17	**Frequency of sample collection**	
18	**What data are collected at sample sites?**	
19	**Monitoring Program biennial cost and fund sources**	Funding sources . 03-05 expenditures- $?? 05-07 prediction- $??
20	**What is the name of the database(s) where these monitoring data reside?**	
21	**How often do you analyze, summarize, compile raw data?**	
22	**Report/publish data?**	
23	**Analyzed/summarized data made available?**	
24	**What is URL?**	
25	**Do other agencies collect data for this monitoring program? If so whom?**	
26	**Data readily available on maps?**	
27	**Data exist as GIS coverage?**	
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	

HCP Roads Implementation Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Monitoring Program Name**	**HCP - Roads Implementation Monitoring Program**
3	**Contact**	Dave Wolfer
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Dept. of Natural Resources, Division of Engineering
6	**Purpose of the monitoring program including monitoring questions being answered**	The Dept. of Natural Resources inventories transportation routes, on DNR forest roads to fulfill our HCP, and Forest & Fish requirements. Number of fish barriers corrected, miles of new construction, reconstruction and road abandonment. Projects completed in RMAPS.
7	**Audience/customer/user**	TFW and Forests and Fish stakeholders include state and federal resource management agencies (WDFW, DNR and Ecology; U.S. Fish and Wildlife Service; National Marine Fisheries Service; large and small private forest landowners, tribal interests; environmental community; and the public.
8	**Authority**	FPA - RCW 76.09 and WAC 222 WADNR Habitat Conservation Plan – Sept 1997
9	**Relates to watershed health and salmon recovery**	Directly Supports
10	**Date monitoring program began or ended?**	HCP Reporting 1999 RMAPS Reporting 2001
11	**Type of monitoring**	Inventory and implementation monitoring
12	**Monitoring design**	
13	**Primary geographic focus**	Statewide state forest lands
14	**Are monitoring sites geospatially referenced?**	Culvert locations were GPS, the rest are not.
15	**Does monitoring program provide data with known precision and certainty?**	Varies
16	**Salmon Recovery Region(s)**	Lower Columbia; Middle Columbia; NE Washington; Non Salmon Recovery Areas; Puget Sound; Snake River; Upper Columbia; Washington Coast
17	**Frequency of sample collection**	Varies
18	**What data are collected at sample sites?**	Road locations, culvert locations, amount of new construction, abandonment, road maintenance and fixed fish barrier culverts.
19	**Monitoring Program biennial cost and fund sources**	Funding source is Access Road Revolving Fund. 03-05 expenditures- $1,290,475 05-07 prediction- $900,000
20	**What is the name of the database(s) where these monitoring data reside?**	TRANS-RDMS Region RMAPs are in a hard copy or a database format.
21	**How often do you analyze, summarize, compile raw data?**	Annually for HCP reports and RMAP annual plans
22	**Report/publish data?**	Varies
23	**Analyzed/summarized data made available?**	Web Downloadable; Web Viewable, Hardcopies of reports and off network databases.
24	**What is URL?**	
25	**Do other agencies collect data for this monitoring program? If so whom?**	Yes
26	**Data readily available on maps?**	Yes
27	**Data exist as GIS coverage?**	Yes
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission Critical - To maintain our HCP, we must report this data annually. To abide by the FPA we maintain and report our RMAPs.

Transportation Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Database**	**Transportation Database**
3	**Database acronym**	TRANS Data
4	**Provide an overview of the data content in this database**	In general, the Transportation Database, a DNR GIS data layer, serves as a corporate repository for information on Transportation Routes, with the greatest attribution on DNR forest roads and trails and private forest roads; Auxiliary data sets include: Transportation Route Structures, e.g. bridges, culverts and gates; Fish Passage Barrier Evaluations, that facilitate addressing Forest and Fish requirements; Road Engineering Projects, that support the development of DNR's Road Maintenance and Abandonment Plan summaries.
5	**Provide the name of the monitoring program(s) this database supports**	This data sets supports a wide variety of monitoring programs by providing the transportation base map information.
6	**Are there other databases that contain the same information? If so, which databases?**	no
7	**Is this database specifically identified by statute? What statute?**	RCW 5822, 5824; ESHB 2091; RCW 76.09; WAC 222 Requirements for regulatory and proprietary land management.
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	varies
11	**Number of years database has been in operation?**	14 years
12	**Does this database contain metadata describing content?**	yes
13	**Where is this database located?**	On the DNR core database and http://www3.wadnr.gov/dnrapp6/dataweb/dmmatrix.html
14	**What is the basic architecture of the database**	Arc/Info
15	**Charge money for the data?**	no
16	**Data sensitive or proprietary?**	No
17	**Raw data made available?**	http://www3.wadnr.gov/dnrapp6/dataweb/dmmatrix.html
18	Data contact person	Sandra Bahr - 360-902-1544 - sandra.bahr@wadnr.gov
19	**Does this database generate reports? If so, what kind of reports**	no
20	**Analyzed/summarized data made available?**	no
21	**Who uses this database?**	Within DNR=land managers/planners, field foresters/engineers/biologists, Forest Practices staff and wildland firefighters. Outside DNR=natural resource agencies, private forest land owners, local jurisdictions, and environmental organizations.
22	**Does Database generate maps?**	Yes
23	**Data exist as GIS coverage?**	Yes
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	General Fund - State
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High

Puget Sound Nearshore Habitat Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Monitoring Program Name**	**Nearshore Habitat Program**
3	**Contact**	Helen Berry - 360-902-1052 - Helen.berry@wadnr.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Dept. of Natural Resources, Aquatics Division
6	**Purpose of the monitoring program including monitoring questions being answered**	The Nearshore Habitat Program inventories and monitors intertidal and shallow subtidal habitats throughout the state, with a focus on Puget Sound. The program is one of eight research components within the Puget Sound Ambient Monitoring Program (PSAMP). It is housed in DNR, the steward for majority of the state's aquatic lands. The mandate of the program, as defined by PSAMP, is to assess the health of Puget Sound. We meet this objective through a series of linked inventory and monitoring programs that track indicators of nearshore habitat condition. The program inventories physical and biotic habitat characteristics at several resolutions, and monitors the following indicators of habitat condition: eelgrass abundance and distribution, canopy-forming kelp, intertidal resident biotic communities. We also complete focus projects to address other issues of interest.
7	**Audience/customer/user**	There are a broad range of audience/customers. The general public is interested in status and trends information. State, federal and local scientists and managers are interested in status and trends information and in data to improve land management.
8	**Authority**	
9	**Relates to watershed health and salmon recovery**	Directly Supports
10	**Date monitoring program began or ended?**	Began in 1989
11	**Type of monitoring**	Status/trends
12	**Monitoring design**	Varies with project. Generally synoptic or probabilistic
13	**Primary geographic focus**	Marine waters
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Generally yes (see individual projects)
16	**Salmon Recovery Region(s)**	Puget Sound; Washington Coast
17	**Frequency of sample collection**	Varies
18	**What data are collected at sample sites?**	Biological
19	**Monitoring Program biennial cost and fund sources**	03-05 expenditures- $1,200K ALEA 05-07 prediction- $1,652K ALEA
20	**What is the name of the database(s) where these monitoring data reside?**	Multiple spatial and tabular databases
21	**How often do you analyze, summarize, compile raw data?**	Annually
22	**Report/publish data?**	Yes. Generally produces annual or biennial reports
23	**Analyzed/summarized data made available?**	Yes
24	**What is URL?**	www2.wadnr.gov/nearshore
25	**Do other agencies collect data for this monitoring program? If so whom?**	
26	**Data readily available on maps?**	Digital data is readily available
27	**Data exist as GIS coverage?**	Yes
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High DNR is mandated to manage and protect aquatic resources. This program provides status/trends information.

Floating Kelp Inventories Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources, Aquatic Resources Division, Nearshore Habitat Program (PSAMP)**
2	**Database**	**Floating Kelp Inventories**
3	**Database acronym**	NA
4	**Provide an overview of the data content in this database**	Database describes annual floating kelp inventories along the Strait of Juan de Fuca and Outer Coast from 1989-2004. This synoptic inventory is repeated yearly for trend analysis.
5	**Provide the name of the monitoring program(s) this database supports**	DNR Nearshore Habitat Program. This program is part of the Puget Sound Assessment and Monitoring Program (PSAMP)
6	**Are there other databases that contain the same information? If so, which databases?**	No.
7	**Is this database specifically identified by statute? What statute?**	No.
8	**Is this database active?**	Yes.
9	**Geospatially referenced?**	Yes.
10	**Frequency of data entry**	Database is updated yearly.
11	**Number of years database has been in operation?**	Since 1989.
12	**Does this database contain metadata describing content?**	Yes.
13	**Where is this database located?**	Nearshore Habitat Program, in DNR's Aquatic Resources Division.
14	**What is the basic architecture of the database**	ArcGIS shape files with associated tabular data.
15	**Charge money for the data?**	No.
16	**Data sensitive or proprietary?**	No.
17	**Raw data made available?**	Yes.
18	**Data contact person**	Pete Dowty, 360-902-1052. peter.dowty@wadnr.gov
19	**Does this database generate reports? If so, what kind of reports**	Reports analyzing trends
20	**Analyzed/summarized data made available?**	Yes.
21	**Who uses this database?**	Data is used for planning and research by local, state, federal, and tribal governments. Non-governmental groups also use the data.
22	**Does Database generate maps?**	No.
23	**Data exist as GIS coverage?**	Yes.
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	Approximate cost of maintaining spatial and tabular data is $17K. Additional funding is used to collect and process data. Fund source is the Aquatic Lands Enhancement Account (ALEA), directed through DNR and through the Puget Action Teams Conservation and Recovery Plan, specifically the Puget Sound Assessment and Monitoring Program. NOAA's Olympic Coast National Marine Sanctuary pays for half of the annual costs.
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Long term project funding through proviso, as part of the Puget Sound Assessment and Monitoring Program.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High – data provides information on a resource that is known to be ecologically important, and is protected in statute. This data is used extensively for planning by many groups, including DNR. DNR is mandated to manage and protect kelp resources. Data supports PSAT's conservation and recovery priorities.

Intertidal Biotic Communities Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources, Aquatic Resources Division, Nearshore Habitat Program (PSAMP)**
2	**Database**	**Intertidal Biotic Community Monitoring**
3	**Database acronym**	NA
4	**Provide an overview of the data content in this database**	Database describes intertidal species and physical characteristics (salinity, temperature) along saltwater shorelines in southern and central Puget Sound.
5	**Provide the name of the monitoring program(s) this database supports**	DNR's Nearshore Habitat Program. This program is part of the Puget Sound Assessment and Monitoring Program (PSAMP)
6	**Are there other databases that contain the same information? If so, which databases?**	No.
7	**Is this database specifically identified by statute? What statute?**	No.
8	**Is this database active?**	Yes.
9	**Geospatially referenced?**	Yes.
10	**Frequency of data entry**	Database is updated annually to include ongoing monitoring data.
11	**Number of years database has been in operation?**	Since 1997.
12	**Does this database contain metadata describing content?**	Yes.
13	**Where is this database located?**	Nearshore Habitat Program, in DNR's Aquatic Resources Division.
14	**What is the basic architecture of the database**	MS Access relational database and ARCGIS shape files..
15	**Charge money for the data?**	No.
16	**Data sensitive or proprietary?**	No.
17	**Raw data made available?**	Yes.
18	**Data contact person**	Helen Berry, 360-902-1052. helen.berry@wadnr.gov
19	**Does this database generate reports? If so, what kind of reports**	No.
20	**Analyzed/summarized data made available?**	Yes, annual monitoring reports are produced.
21	**Who uses this database?**	Ecologists at DNR and University of Washington (UW) use the database. Summary data available to the public through the program website.
22	**Does Database generate maps?**	No.
23	**Data exist as GIS coverage?**	Yes, points identifying sampling sites are stored in ArcGIS shape files.
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	Approximate cost of maintaining spatial and tabular data is $22K per biennium. Fund source is the Aquatic Lands Enhancement Account (ALEA), directed through DNR and through the Puget Action Teams Conservation and Recovery Plan, specifically the Puget Sound Assessment and Monitoring Program.
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Long term project funding through proviso, in concert with the Puget Sound Assessment and Monitoring Program.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High – data provides information on the environmental health of Puget Sound's shorelines, which DNR is mandated to protect. Data supports PSAT's conservation and recovery priorities.

Skagit-Whatcom County Intertidal Habitat Inventory Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources, Aquatic Resources Division, Nearshore Habitat Program (PSAMP)**
2	**Database**	**Skagit County and Whatcom County Intertidal Habitat Inventories**
3	**Database acronym**	NA
4	**Provide an overview of the data content in this database**	Database describes physical characteristics and vegetation along saltwater shorelines. It is a synoptic inventory.
5	**Provide the name of the monitoring program(s) this database supports**	DNR Nearshore Habitat Program. This program is part of the Puget Sound Assessment and Monitoring Program (PSAMP)
6	**Are there other databases that contain the same information? If so, which databases?**	No.
7	**Is this database specifically identified by statute? What statute?**	No.
8	**Is this database active?**	Yes.
9	**Geospatially referenced?**	Yes.
10	**Frequency of data entry**	Database was collected in 1995 for Whatcom County and 1996 for Skagit County. Data is not updated.
11	**Number of years database has been in operation?**	Since 1997.
12	**Does this database contain metadata describing content?**	Yes.
13	**Where is this database located?**	Nearshore Habitat Program, in DNR's Aquatic Resources Division.
14	**What is the basic architecture of the database**	ArcGIS shape files, ARCINFO coverages, or Raster data, with associated tabular data.
15	**Charge money for the data?**	No.
16	**Data sensitive or proprietary?**	No.
17	**Raw data made available?**	Yes.
18	**Data contact person**	Pete Dowty, 360-902-1052. peter.dowty@wadnr.gov
19	**Does this database generate reports? If so, what kind of reports**	No.
20	**Analyzed/summarized data made available?**	Yes.
21	**Who uses this database?**	Data is used for planning and research by local, state, federal, and tribal governments. Non-governmental groups also use the data.
22	**Does Database generate maps?**	No.
23	**Data exist as GIS coverage?**	Yes.
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$0K Because the database is not being updated, maintenance costs are minimal. Fund source is the Aquatic Lands Enhancement Account (ALEA), directed through DNR and through the Puget Action Teams Conservation and Recovery Plan, specifically the Puget Sound Assessment and Monitoring Program.
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Long term project funding through proviso, as part of the Puget Sound Assessment and Monitoring Program.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Medium – data provides information on Puget Sound's habitats, but it's value is decreased because it is no longer current and it covers a limited area. This data is used for. DNR is mandated to protect the shorelines. Data supports PSAT's conservation and recovery priorities.

Eelgrass Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources, Aquatic Resources Division, Nearshore Habitat Program (PSAMP)**
2	**Database**	**Eelgrass monitoring (the Submerged Vegetation Monitoring Program)**
3	**Database acronym**	NA
4	**Provide an overview of the data content in this database**	Database describes annual eelgrass monitoring at sites throughout Greater Puget Sound. Sites are selected through probabilistic monitoring framework
5	**Provide the name of the monitoring program(s) this database supports**	DNR Nearshore Habitat Program. This program is part of the Puget Sound Assessment and Monitoring Program (PSAMP)
6	**Are there other databases that contain the same information? If so, which databases?**	No.
7	**Is this database specifically identified by statute? What statute?**	No.
8	**Is this database active?**	Yes.
9	**Geospatially referenced?**	Yes.
10	**Frequency of data entry**	Database is updated yearly.
11	**Number of years database has been in operation?**	Since 2000.
12	**Does this database contain metadata describing content?**	Yes.
13	**Where is this database located?**	Nearshore Habitat Program, in DNR's Aquatic Resources Division.
14	**What is the basic architecture of the database**	MS Access relational database, and ArcGIS shape files.
15	**Charge money for the data?**	No.
16	**Data sensitive or proprietary?**	No.
17	**Raw data made available?**	Yes.
18	**Data contact person**	Pete Dowty, 360-902-1052. peter.dowty@wadnr.gov
19	**Does this database generate reports? If so, what kind of reports**	No.
20	**Analyzed/summarized data made available?**	Data is summarized and analyzed in annual monitoring reports.
21	**Who uses this database?**	Data is used for planning and research by local, state, federal, and tribal governments. Non-governmental groups also use the data.
22	**Does Database generate maps?**	No.
23	**Data exist as GIS coverage?**	Yes.
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	Approximate cost of maintaining spatial and tabular data is $55K per biennium. Fund source is the Aquatic Lands Enhancement Account (ALEA), directed through DNR and through the Puget Action Teams Conservation and Recovery Plan, specifically the Puget Sound Assessment and Monitoring Program.
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Long term project funding through proviso, as part of the Puget Sound Assessment and Monitoring Program.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission Critical – data provides information on a resource that is known to be ecologically important, and is protected in statute. Eelgrass is an indicator of environmental health used by PSAT and other groups. This data is used for planning by many groups, including DNR. DNR is mandated to manage and protect kelp resources. Data supports PSAT's conservation and recovery priorities.

Washington Shore zone Inventory Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources, Aquatic Resources Division, Nearshore Habitat Program (PSAMP)**
2	**Database**	**Washington State ShoreZone Inventory**
3	**Database acronym**	NA
4	**Provide an overview of the data content in this database**	Database describes physical and biological characteristics of saltwater shorelines throughout Washington State (approximately 3000 miles). It is a synoptic inventory.
5	**Provide the name of the monitoring program(s) this database supports**	DNR Nearshore Habitat Program. This program is part of the Puget Sound Assessment and Monitoring Program (PSAMP)
6	**Are there other databases that contain the same information? If so, which databases?**	No.
7	**Is this database specifically identified by statute? What statute?**	No.
8	**Is this database active?**	Yes.
9	**Geospatially referenced?**	Yes.
10	**Frequency of data entry**	Database was completed in 2001, data is not updated.
11	**Number of years database has been in operation?**	Since 2001.
12	**Does this database contain metadata describing content?**	Yes.
13	**Where is this database located?**	Nearshore Habitat Program, in DNR's Aquatic Resources Division.
14	**What is the basic architecture of the database**	ArcGIS shape files with associated tabular data.
15	**Charge money for the data?**	No.
16	**Data sensitive or proprietary?**	No.
17	**Raw data made available?**	Yes.
18	**Data contact person**	Pete Dowty, 360-902-1052. peter.dowty@wadnr.gov
19	**Does this database generate reports? If so, what kind of reports**	No.
20	**Analyzed/summarized data made available?**	Yes.
21	**Who uses this database?**	Data is used widely for planning and research by local, state, federal, tribal, and foreign governments. Non-governmental groups also use the data extensively.
22	**Does Database generate maps?**	No.
23	**Data exist as GIS coverage?**	Yes.
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$0K Because the database is not being updated, maintenance costs are minimal. Fund source is the Aquatic Lands Enhancement Account (ALEA), directed through DNR and through the Puget Action Teams Conservation and Recovery Plan, specifically the Puget Sound Assessment and Monitoring Program.
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Long term project funding through proviso, in concert with the Puget Sound Assessment and Monitoring Program.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission critical – data provides information on Puget Sound's shoreline characteristics. This data is used extensively for planning by many groups, including DNR. DNR is mandated to protect the shorelines. Data supports PSAT's conservation and recovery priorities.

Historic Puget Sound Tidal Habitats Inventory

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Database**	**Historic Puget Sound Tidal Habitats**
3	**Database acronym**	NA
4	**Provide an overview of the data content in this database**	Database describes historic habitats along the shorelines and river deltas of Puget Sound. The primary source for this data are historic maps created by the United States Coast and Geodetic Survey between 1852 and 1926. Current tidal wetland habitats were also characterized.
5	**Provide the name of the monitoring program(s) this database supports**	None.
6	**Are there other databases that contain the same information? If so, which databases?**	No
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	Database is complete. Additional refinements to database may occur if other sources of historical habitat characterizations can be identified.
11	**Number of years database has been in operation?**	Development ended in June 2005.
12	**Does this database contain metadata describing content?**	Yes
13	**Where is this database located?**	Database is maintained by DNR's Aquatics Division
14	**What is the basic architecture of the database**	Personal Geodatabase with feature classes for line and polygon attributes.
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary?**	No
17	**Raw data made available?**	Yes
18	**Data contact person**	Philip Bloch – 360-902-1718 Philip.bloch@wadnr.gov
19	**Does this database generate reports? If so, what kind of reports**	No
20	**Analyzed/summarized data made available?**	Yes – the data has been used to create a summary report of habitat losses in Puget Sound wetlands.
21	**Who uses this database?**	Cartographers, restoration planners
22	**Does Database generate maps?**	Yes
23	**Data exist as GIS coverage?**	Yes
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	No funds are currently allocated to this database.
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	NA
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Medium – Data provides a critical context for restoration planning. Knowing where habitats have been lost and the historic structure informs restoration and conservation planning efforts.

Aquatic Land Encumbrance Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Database**	**Aquatic Land Encumbrance Database**
3	**Database acronym**	NA
4	**Provide an overview of the data content in this database**	Databases characterize uses of state owned aquatic lands within the state of Washington. Uses of state-owned aquatic lands are presented as data points with numerous attributes that characterize the use. Associated components of the dataset characterize overwater structures over state owned aquatic lands as polygons.
5	**Provide the name of the monitoring program(s) this database supports**	Washington DNR - Aquatic Division
6	**Are there other databases that contain the same information? If so, which databases?**	Yes – some of the data in a non-spatial format is also available through Washington DNR's NaturE data system used for tracking leasing activity and revenue. Some of the data is also maintained on the paper Aquatic Plates maintained by DNR's title office.
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	Database is updated as new leasing activity occurs.
11	**Number of years database has been in operation?**	Initial development ended in December 2005. The database is currently being maintained.
12	**Does this database contain metadata describing content?**	No – under development
13	**Where is this database located?**	Database is maintained by DNR's Aquatics Division.
14	**What is the basic architecture of the database**	Personal Geodatabases with feature classes for point and polygon attributes.
15	**Charge money for the data?**	NO
16	**Data sensitive or proprietary?**	YES
17	**Raw data made available?**	Yes
18	**Data contact person**	Philip Bloch – 360-902-1718 Philip.bloch@wadnr.gov
19	**Does this database generate reports? If so, what kind of reports**	No
20	**Analyzed/summarized data made available?**	No
21	**Who uses this database?**	Anyone interested in aquatic land management and uses of state owned aquatic land for development (e.g., roads, utilities, overwater structures, etc.)
22	**Does Database generate maps?**	Yes
23	**Data exist as GIS coverage?**	Yes
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	Database generated during 2005 at a cost to date of approximately $100,000 drawing from a variety of sources. Funding for maintenance is derived from DNR's RMCA (aquatic land management) accounts, and additional development/augmentation of the database is currently being funded through ad hoc funding requests and grant proposals.
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Maintenance costs for encumbrance data points are funded through dedicated funds. Augmentation/expansion of data sets are not currently funded. The data has several limitations in its current format so future updates to the data maintenance are anticipated.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission critical – This data system may eventually replace a paper data management system that DNR is require to maintain relating to uses of state owned aquatic lands (RCW 79.125.040). Additionally this data system is already in use by aquatic land managers for management of state owned aquatic lands.

Dredged Site Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Monitoring Program Name**	**Dredged Material Management Program**
3	**Contact**	
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Dept. of Natural Resources, Division of Engineering
6	**Purpose of the monitoring program including monitoring questions being answered**	DMMP is tasked with management of designated open-water dredged material disposal sites in Puget Sound and coastal Washington. The organization is a cooperative agreement between US Army Corps of Engineers, US EPA Region 10, and the WA Departments of Ecology and Natural Resources. Dredged materials destined for open water disposal are evaluated for suitability, dredging and disposal activities are monitored for conformity to permit specifics, and disposal sites are environmentally monitored to evaluate environmental impacts.
7	**Audience/customer/user**	The target audience is the dredging community of Puget Sound and coastal Washington and those environmental groups that are concerned with dredging, dredged material disposal, and related impacts to the aquatic environment.
8	**Authority**	RCW 79.90.550, 79.90.555, 79.90.560; WAC 332-30-166
9	**Relates to watershed health and salmon recovery**	No Relationship
10	**Date monitoring program began or ended?**	
11	**Type of monitoring**	Effectiveness
12	**Monitoring design**	
13	**Primary geographic focus**	Statewide
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	
16	**Salmon Recovery Region(s)**	Puget Sound; Washington Coast
17	**Frequency of sample collection**	Varies
18	**What data are collected at sample sites?**	Geologic; Marine/Estuarine Water Quality
19	**Monitoring Program biennial cost and fund sources**	
20	**What is the name of the database(s) where these monitoring data reside?**	Dredged material Management Database
21	**How often do you analyze, summarize, compile raw data?**	Annually
22	**Report/publish data?**	Every 2 Yrs
23	**Analyzed/summarized data made available?**	Web Downloadable; Web Viewable www.nws.usace.army.mil/dmmo/homepage.htm
24	**What is URL?**	Web Downloadable; Web Viewable www.nws.usace.army.mil/dmmo/homepage.htm
25	**Do other agencies collect data for this monitoring program? If so whom?**	
26	**Data readily available on maps?**	
27	**Data exist as GIS coverage?**	
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	

29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	

Dredged Material Management Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources**
2	**Database**	**Dredged Material Management Database**
3	**Database acronym**	DMMP
4	**Provide an overview of the data content in this database**	DMMP is tasked with management of designated open-water dredged material disposal sites in Puget Sound and coastal Washington. The organization is a cooperative agreement between US Army Corps of Engineers, US EPA Region 10, and the WA Departments of Ecology and Natural Resources. Dredged materials destined for open water disposal are evaluated for suitability, dredging and disposal activities are monitored for conformity to permit specifics, and disposal sites are environmentally monitored to evaluate environmental impacts.
5	**Provide the name of the monitoring program(s) this database supports**	Dredge Site Monitoring Program
6	**Are there other databases that contain the same information? If so, which databases?**	no
7	**Is this database specifically identified by statute? What statute?**	
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	
11	**Number of years database has been in operation?**	
12	**Does this database contain metadata describing content?**	
13	**Where is this database located?**	
14	**What is the basic architecture of the database**	
15	**Charge money for the data?**	
16	**Data sensitive or proprietary?**	
17	**Raw data made available?**	
18	**Data contact person**	Robert Brenner - 360-902-1083 - robert.brenner@wadnr.gov
19	**Does this database generate reports? If so, what kind of reports**	
20	**Analyzed/summarized data made available?**	
21	**Who uses this database?**	
22	**Does Database generate maps?**	
23	**Data exist as GIS coverage?**	
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	

Lakes of Washington Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Natural Resources/Washington Department of Ecology**
2	**Database**	**Lakes of Washington and Water Supply Bulletins**
3	**Database acronym**	NA
4	**Provide an overview of the data content in this database**	Databases provide an overall inventory of the lake resources in the state including characterizations of water chemistry, elevation, size, etc. For a subset of the lakes evaluated the watershed area of the lakes has also been delineated using 30m DEMs.
5	**Provide the name of the monitoring program(s) this database supports**	None.
6	**Are there other databases that contain the same information? If so, which databases?**	No
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	Database is complete and represents data presented in water supply bulletins presented by Washington Department of Ecology as well as some data presented by USGS.
11	**Number of years database has been in operation?**	Development ended in June 2005.
12	**Does this database contain metadata describing content?**	Yes
13	**Where is this database located?**	Database is maintained by DNR's Aquatics Division. Available for download from http://www3.wadnr.gov/dnrapp6/dataweb/dmmatrix.html.
14	**What is the basic architecture of the database**	Personal Geodatabases with feature classes for point and polygon attributes.
15	**Charge money for the data?**	NO
16	**Data sensitive or proprietary?**	NO
17	**Raw data made available?**	Yes
18	**Data contact person**	Philip Bloch – 360-902-1718 Philip.bloch@wadnr.gov
19	**Does this database generate reports? If so, what kind of reports**	No
20	**Analyzed/summarized data made available?**	Yes – Water supply bulletins are available for download from http://www.ecy.wa.gov/programs/eap/wsb/wsb_Lakes.html
21	**Who uses this database?**	Anyone interested in basic characterizations of lakes in Washington.
22	**Does Database generate maps?**	Yes
23	**Data exist as GIS coverage?**	Yes
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	No funds are currently allocated to this database.
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	NA
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Medium – Data provides a critical context for management of lake ecosystems.

Appendix 3. Department of Fish and Wildlife Monitoring Program and Database Survey Sheets

Statewide Salmon Spawner Abundance Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Monitoring Program Name**	**Statewide Salmon Spawner Abundance Monitoring Program**
3	**Contact**	Tim Flint (360-902-2728)
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Fish Program – Fish Management
6	**Purpose of the monitoring program including monitoring questions being answered**	Annual estimates of salmon spawning escapement. Measurement of the proportion of hatchery fish in natural spawning areas.
7	**Audience/customer/user**	State agencies, fishery managers, tribes, federal entities, PUDs, user groups, general public.
8	**Authority**	Agency mission; no specific statutes.
9	**Relates to watershed health and salmon recovery**	This information is imperative in determining salmon recovery.
10	**Date monitoring program began or ended?**	Continuous database beginning in the 1950s with significant additions to survey coverage through the 1980s and 1990s. The current level of spawning ground survey coverage is the bare minimum needed both for fish management needs and to monitor trends in spawning populations.
11	**Type of monitoring**	Status monitoring
12	**Monitoring design**	Variable but primarily live and dead fish counts and redd based surveys.
13	**Primary geographic focus**	Puget Sound
14	**Are monitoring sites geospatially referenced?**	Monitoring sites are index areas that are surveyed regularly during the spawning season and have been strategically spaced to attempt to provide the best relative escapement estimates between years. Geo-spatial referencing is limited to use of Stream Catalog stream codes and river mile estimates based on the Catalog.
15	**Does monitoring program provide data with known precision and certainty?**	The methodology employed attempts to provide spawner counts as precisely as possible given the limitations of environmental conditions and of staffing and funding limitations.
16	**Salmon Recovery Region(s)**	Puget Sound
17	**Frequency of sample collection**	Generally weekly surveys are conducted throughout the spawning season.
18	**What data are collected at sample sites?**	Primarily numbers of live and dead spawners and numbers of redds. Also biological data including mark status of carcasses and sex and scale samples where appropriate.
19	**Monitoring Program biennial cost and fund sources**	$9.6 million Estimated split: 40% state, 60% fed/local sources
20	**What is the name of the database(s) where these monitoring data reside?**	SGS (Spawning Ground Survey system)
21	**How often do you analyze, summarize, compile raw data?**	Annually
22	**Report/publish data?**	Summary reports of escapement are available but not in a specific WDFW publication.
23	**Analyzed/summarized data made available?**	Yes, as needed for forecasting and management and other needs as requested.
24	**What is URL?**	
25	**Do other agencies collect data for this monitoring program? If so whom?**	Yes – Puget Sound Treaty tribes, some local non-profit groups.
26	**Data readily available on maps?**	No
27	**Data exist as GIS coverage?**	No
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes – status of stocks for ESA (NOAA Fisheries) – fishery management and rebuilding – Pacific Salmon Treaty (US and Canada), Alaska, Tribes, NMFS, Pacific Fishery Management Council, Salmon Recovery – other government entities, private interests and the general public.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission Critical – Salmon escapement information is the cornerstone for estimating salmon run sizes which is necessary for forecasting, planning and properly managing sustainable fisheries, monitoring of salmon stock status, ESA compliance, salmon recovery, etc.

Smolt Monitoring Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Smolt Monitoring**
3	**Database acronym**	SM
4	**Provide an overview of the data content in this database**	Downstream migrant catches by fishing period, mark sampling, length data, and trap efficiency results
5	**Provide the name of the monitoring program(s) this database supports**	Smolt Monitoring, Intensively Monitored Watersheds
6	**Are there other databases that contain the same information? If so, which databases?**	This database covers WDFW projects in Puget Sound, the Washington Coast, and selected Columbia River sites. Separate databases are maintained by WDFW regional staff, tribes, USFWS, and ODFW for other smolt monitoring projects occurring in Washington.
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	No
10	**Frequency of data entry**	Annually
11	**Number of years database has been in operation?**	30
12	**Does this database contain metadata describing content?**	No
13	**Where is this database located?**	WDFW servers and PCs
14	**What is the basic architecture of the database**	dBase
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary? Why?**	No
17	**Raw data made available?**	Yes
18	**Data contact person**	Mark Hino
19	**Does this database generate reports? If so, what kind of reports**	Yes, summary
20	**Analyzed/summarized data made available?**	Yes
21	**Who uses this database?**	WDFW staff
22	**Does Database generate maps?**	No
23	**Data exist as GIS coverage?**	No
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$136,000 of which $6K GFS and $130K GFF
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	A variety of funds, primarily federal DJ matched with contract dollars funds this work along with some local contract monies. Contracts have various end dates.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High, this database is the foundation for juvenile wild salmon monitoring in Puget Sound and the Washington coast. The data are used to annually estimate smolt production for listed and non-listed species in these two regions and for the Intensively Monitored Watersheds project. It is also used in the annual forecasting of wild coho run sizes.
27	**What enhancements should this database receive to increase its usefulness?**	The database should be converted to run in a Windows compatible environment.

Smolt Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Smolt Monitoring**
3	**Contact**	Greg Volkhardt – (360) 902-2779, volkhgcv@dfw.wa.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Fish Program
6	**Purpose of the monitoring program including monitoring questions being answered**	Quantifies the annual freshwater production of selected species and stocks of wild salmon. -What is the status/trend of juvenile migrant salmon in selected waters? -What is the annual freshwater production of selected species in selected waters?
7	**Audience/customer/user**	Fishery co-managers, IAC SRFB, Governor's Forum on Monitoring, State of the Salmon Report, state, federal, and local government agencies
8	**Authority**	Internal
9	**Relates to watershed health and salmon recovery**	Directly supports. Essential component of the Intensively Monitored Watersheds project
10	**Date monitoring program began or ended?**	1975
11	**Type of monitoring**	Status and Trend Monitoring
12	**Monitoring design**	Index
13	**Primary geographic focus**	Selected watersheds/WRIAs in Puget Sound, the Washington coast, and Columbia River
14	**Are monitoring sites geospatially referenced?**	No
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Puget Sound, Coastal, Lower Columbia
17	**Frequency of sample collection**	Annual
18	**What data are collected at sample sites**	Downstream migrant abundance and productivity (where escapement data is available), biological information, mark sampling.
19	**Monitoring Program biennial cost and fund sources**	$2,110K . of which $84K GFS and $2,026K GFF. A variety of funds, primarily SRFB and federal DJ matched with state and contract dollars funds this work along with local contract monies. Contracts have various end dates.
20	**What is the name of the database(s) where these monitoring data reside?**	Smolt monitoring
21	**How often do you analyze, summarize, compile raw data?**	Annually, as resources permit
22	**Report/publish data?**	Annually, as resources permit
23	**Analyzed/summarized data made available?**	Yes, annual and contractual reports. Electronic reports (.pdf files). Some reports/data are available on the web.
24	**What is URL?**	http://wdfw.wa.gov/fish/wild_salmon_monitor/
25	**Do other agencies collect data for this monitoring program? If so whom?**	Various tribal governments, USFWS, ODFW, and WDFW regional staffs also collect this information in Washington waters, but maintain separate databases.
26	**Data readily available on maps?**	No
27	**Data exist as GIS coverage?**	Monitoring sites available on SalmonScape
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	The SRFB relies on this information for its Intensively Monitored Watersheds validation monitoring program. NOAA Fisheries, the GSRO, the SRFB, and the Governor's Forum on Monitoring rely on this data for the State of the Salmon Report and for informing listing/de-listing criteria decisions. Co-managers rely on this information to evaluate and forecast the abundance of wild salmonid populations for fisheries management.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High. This program provides key information on the status and trends in wild salmonid populations. It enables the evaluation and tracking of stock performance in the freshwater environment where most of the salmon restoration activities are occurring. Not withstanding its use for monitoring salmon recovery, data from this program is also used to forecast coho run sizes and to develop management models (e.g. spawner recruit models) for wild populations.

Adult Trapping

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**WDFW**
2	**Database**	**Adult Trapping**
3	**Contact**	Greg Volkhardt – (360) 902-2779, volkhgcv@dfw.wa.gov
4	**Program described in CMS survey?**	
5	**What department or division is it under?**	Fish Program
6	**Purpose of the monitoring program including monitoring questions being answered**	Quantifies the spawning escapement of selected species and stocks of wild salmon. -What is the status/trend of adult salmon escapement in selected waters? -What is the marine survival of wild salmon populations in selected waters?
7	**Audience/customer/user**	Fishery co-managers, IAC SRFB, Governor's Forum on Monitoring, state, federal, and local government agencies
8	**Authority**	Internal
9	**Relates to watershed health and salmon recovery**	Directly supports. Essential component of the Intensively Monitored Watersheds project
10	**Date monitoring program began or ended?**	??
11	**Type of monitoring**	Status and Trend Monitoring
12	**Monitoring design**	Index
13	**Primary geographic focus**	Selected watersheds/WRIAs in Puget Sound, the Washington coast, and Columbia River
14	**Are monitoring sites geospatially referenced?**	No
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Puget Sound, Coastal, Lower Columbia
17	**Frequency of sample collection**	Annual
18	**What data are collected at sample sites**	Adult escapement of wild salmonids, biological information, mark/tag sampling.
19	**Monitoring Program biennial cost and fund sources**	
20	**What is the name of the database(s) where these monitoring data reside?**	Adult Trapping
21	**How often do you analyze, summarize, compile raw data?**	Annually, as resources permit
22	**Report/publish data?**	Annually, as resources permit
23	**Analyzed/summarized data made available?**	Yes, annual and contractual reports. Electronic reports (.pdf files). Some reports/data are available on the web.
24	**What is URL?**	http://wdfw.wa.gov/fish/wild_salmon_monitor/
25	**Do other agencies collect data for this monitoring program? If so whom?**	WDFW regional staffs and the Habitat Program also collect this information in Washington waters, but maintain separate databases.
26	**Data readily available on maps?**	No
27	**Data exist as GIS coverage?**	No
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	The SRFB relies on this information for its Intensively Monitored Watersheds validation monitoring program. Co-managers rely on this information to evaluate and forecast marine (smolt-to-adult) survival of wild salmonid populations.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High. This program provides key information on the status and trends in wild salmonid populations. It enables the evaluation and tracking of stock performance. Not withstanding its use for monitoring salmon recovery, data from this program is also used to forecast coho run sizes and to develop management models (e.g. spawner recruit models) for wild populations.

Adult Trapping Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Adult Trapping**
3	**Database acronym**	AT
4	**Provide an overview of the data content in this database**	Adult trap catches by fishing period, mark sampling, length data
5	**Provide the name of the monitoring program(s) this database supports**	Adult Monitoring, Intensively Monitored Watersheds
6	**Are there other databases that contain the same information? If so, which databases?**	This database covers WDFW projects in Puget Sound, the Washington Coast, and selected Columbia River sites. Separate databases are maintained by WDFW regional staff and Habitat Program staff.
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	No
10	**Frequency of data entry**	Annually
11	**Number of years database has been in operation?**	30
12	**Does this database contain metadata describing content?**	No
13	**Where is this database located?**	Individual biologist's PCs
14	**What is the basic architecture of the database**	spreadsheet
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary? Why?**	No
17	**Raw data made available?**	Yes
18	**Data contact person**	Lori Kishimoto
19	**Does this database generate reports? If so, what kind of reports**	No
20	**Analyzed/summarized data made available?**	Yes
21	**Who uses this database?**	WDFW staff
22	**Does Database generate maps?**	No
23	**Data exist as GIS coverage?**	No
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$38K - $2K GFS and $36K GFF $900K – Fed/Local
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	A variety of funds, primarily federal DJ matched with state and contract dollars funds this work along with local contract monies. Contracts have various end dates.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High, this database monitors adult escapement for selected watersheds/populations within Puget Sound, the Washington coast, and Columbia River. Escapements developed from this database are either counts or estimates of much higher precision than typical spawning ground survey based estimates and; therefore, track the status and trends in population abundance with a high degree of accuracy.
27	**What enhancements should this database receive to increase its usefulness?**	The database should be centralized and converted to run in a Windows compatible environment.

Herring Stock Assessment Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Monitoring Program Name**	**Herring Stock Assessment**
3	**Contact**	Kurt Stick – Phone 360-466-4345 x. 243 – stickkcs@dfw.wa.gov
4	**Program described in CMS survey?**	No
5	**What department or division is it under?**	Fish Program, Region 4
6	**Purpose of the monitoring program including monitoring questions being answered**	Herring stock assessment project provides annual estimates of herring spawning biomass and spawning locations for all Washington state herring stocks for fishery and habitat management purposes. Annual herring spawning biomass is estimated for each stock using spawn deposition surveys and/or acoustic-trawl surveys.
7	**Audience/customer/user**	State, federal, and tribal fish managers; state, tribal, and local government habitat managers; private shoreline developers.
8	**Authority**	RCW
9	**Relates to watershed health and salmon recovery**	No. Not associated with any specific watershed because study area is Marine waters, including Puget Sound. There is no direct link between salmon and herring abundance.
10	**Date monitoring program began or ended?**	Herring stock assessment has been conducted by WDFW from 1973 to date.
11	**Type of monitoring**	status monitoring
12	**Monitoring design**	Spawn deposition surveys provide a direct estimate of herring spawning biomass. Marine vegetation on spawning grounds is sampled for location of spawn deposition and spawn density, and those data are converted to an estimate of spawning escapement. Acoustic-trawl surveys are conducted on the pre-spawner holding areas early in the spawning season when pre-spawner abundance is peaking. This method utilizes computer interfaced echosounding equipment that produces real-time estimates of total fish abundance, which are apportioned to herring biomass based on trawl catch data. Analyses of the trawl caught samples provide the basis for detailed stock indices such as biomass age composition, annual survival rates, and recruitment.
13	**Primary geographic focus**	Marine waters
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	No
16	**Salmon Recovery Region(s)**	Puget Sound
17	**Frequency of sample collection**	Annually
18	**What data are collected at sample sites?**	Data collected typically include location, depth, herring spawn intensity, marine vegetation types, biological data from sampled fish.
19	**Monitoring Program biennial cost and fund sources**	$175K
20	**What is the name of the database(s) where these monitoring data reside?**	Forage Fish Database
21	**How often do you analyze, summarize, compile raw data?**	Annually
22	**Report/publish data?**	Yes.
23	**Analyzed/summarized data made available?**	Email
24	**What is URL?**	No
25	**Do other agencies collect data for this monitoring program? If so whom?**	No
26	**Data readily available on maps?**	Currently limited to some stocks/years
27	**Data exist as GIS coverage?**	Currently limited to some stocks/years
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes. Primary data source for recent ESA reviews for herring in Puget Sound. Shoreline development impacted by spawning ground documentation.
29	**How would you rank the**	Mission critical due to fishery, habitat, and ecological issues related to

	importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?	herring abundance and distribution. Herring stock status monitoring accomplished by this program are required as part of the Boldt Case decision. Herring is the only forage fish for which a long-term abundance database and stock status monitoring program exists.

Video Surveys Rocky Marine Habitats Monitoring

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Monitoring Program Name**	**Quantitative Video Surveys of Rocky Habitats**
3	**Contact**	Wayne Palsson palsswap@dfw.wa.gov
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Fish Program
6	**Purpose of the monitoring program including monitoring questions being answered**	The purpose of the quantitative video survey is to estimate the populations of rockfish, lingcod, and other fish and shellfish associated with rocky habitats within the various basins of the inland marine waters of Washington. A WDFW vessel is used to deploy a quantitative video camera at randomly-selected rocky habitat stations in the nearshore zone. These devices are used to estimate fish densities and describe habitats at the selected station. The station densities are averaged and the population estimated by multiplying the average density by the area of the region and stratum. Regions are rotated over the years such that most regions are surveyed every three years. Survey estimates have been imprecise due to the difficulty in estimating the radius of the video plot and new studies are showing that towed camera and ROV transects are more informative.
7	**Audience/customer/user**	State and tribal ground fish managers, PSAMP scientists, Marine Science community, Marine Reserve designers, County MRCs.
8	**Authority**	WDFW has authority to sample fish and shellfish resources.
9	**Relates to watershed health and salmon recovery**	Yes Addresses species diversity and the effectiveness of hatchery actions to reduce threats to wild salmon and steelhead and rebuild wild populations.
10	**Date monitoring program began or ended?**	Not provided
11	**Type of monitoring**	Status and trends monitoring
12	**Monitoring design**	
13	**Primary geographic focus**	Marine waters
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Puget Sound
17	**Frequency of sample collection**	Annually or funding dependent
18	**What data are collected at sample sites?**	Provide estimates of key species with a percent coefficient of variation of 30% or less. Provide estimates of the size composition of key marine fish and shellfish. Evaluate trends over time. Map rocky habitat. Determine the relationship between key species and habitat factors. Bottom fish especially copper, quillback, brown and other rockfishes, lingcod, kelp greenling, invertebrates including red and green sea urchins and sea cucumbers
19	**Monitoring Program biennial cost and fund sources**	$86K GFS
20	**What is the name of the database(s) where these monitoring data reside?**	Databases reside with the Marine Fish Science Unit
21	**How often do you analyze, summarize, compile raw data?**	Annually
22	**Report/publish data?**	Annually
23	**Analyzed/summarized data made available?**	Email, web not available
24	**What is URL?**	
25	**Do other agencies collect data for this monitoring program? If so whom?**	
26	**Data readily available on maps?**	Yes
27	**Data exist as GIS coverage?**	Yes
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes. These data provide fishery-dependent information on populations trends that are used for managing recreational fisheries and for evaluating species at risk.
29	**How would you rank the**	High. Without fishery-independent estimates of abundance and trends, we

	importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?	cannot evaluate agency strategies and rules made to recover depleted species of rockfishes or sensitive species such as lingcod.

Coded Wire Tag/Mass Marking Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Monitoring Program Name**	**Coded Wire Tagging / mass marking Program**
3	**Contact**	Mark Kimbel (360) 902-2406
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Fish Program NRB, Olympia
6	**Purpose of the monitoring program including monitoring questions being answered**	Coded wire tags allow managers to trace the contribution of Washington stocks to all coastal fisheries from Alaska to California. Also allows estimated of marine survival, hatchery stock performance and other evaluations. Mass marking of steelhead, chinook and coho salmon allow determinations of hatchery impacts to wild salmon populations by allowing positive identification of hatchery fish on the spawning grounds. It also allows managers to target hatchery fish in mixed stock fisheries and release wild fish.
7	**Audience/customer/user**	All coastal states and treaty Indian tribes, NOAA Fisheries, Pacific Salmon Commission, Pacific Fishery Management Council
8	**Authority**	Federal Mass Marking legislation 2003, state mass marking legislation, Pacific Salmon Treaty
9	**Relates to watershed health and salmon recovery**	Yes
10	**Date monitoring program began or ended?**	Mass marking – 1981, CWT – 1974 As large scale monitoring programs
11	**Type of monitoring**	Status Monitoring
12	**Monitoring design**	
13	**Primary geographic focus**	Coast wide and all rivers and streams
14	**Are monitoring sites geospatially referenced?**	
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	All
17	**Frequency of sample collection**	Per group of fish mass marked or tagged – minimum of annually
18	**What data are collected at sample sites?**	Coded wire tag number which identifies location of release, date, size, stock, and other information
19	**Monitoring Program biennial cost and fund sources**	CWT –$6.06K $910K GFS and $5,150K GFF Mass marking –$5.825K $2,620K GFS and $3,200K GFF
20	**What is the name of the database(s) where these monitoring data reside?**	Regional Mark Information System WDFW Hatchery Release database
21	**How often do you analyze, summarize, compile raw data?**	Annually
22	**Report/publish data?**	Annually
23	**Analyzed/summarized data made available?**	Annually
24	**What is URL?**	www.rmpc.org
25	**Do other agencies collect data for this monitoring program? If so whom?**	No
26	**Data readily available on maps?**	No
27	**Data exist as GIS coverage?**	No
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes, stock identification and fishery management
29	**How would you rank the importance of this monitoring program for conducting agency business?(redundant, not necessary, low, medium, high, mission critical) Why?**	Mission critical

CWT Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington Department of Fish and Wildlife**
2	**Database**	**Coded-wire Tag Recovery Database**
3	**Database acronym**	CWT
4	**Provide an overview of the data content in this database**	The project provides counts of the observed and estimated numbers of returning coded-wire tagged salmon and steelhead that are harvested and collected in Washington waters.
5	**Provide the name of the monitoring program(s) this database supports**	Coded-wire tag occurrences in fisheries and escapement.
6	**Are there other databases that contain the same information? If so, which databases?**	None
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	No
10	**Frequency of data entry**	Continuous
11	**Number of years database has been in operation?**	31
12	**Does this database contain metadata describing content?**	No
13	**Where is this database located?**	WDFW Sun server .
14	**What is the basic architecture of the database**	Sybase relational database
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary? Why?**	No
17	**Raw data made available?**	Yes
18	**Data contact person**	Susan Markey
19	**Does this database generate reports? If so, what kind of reports**	No.
20	**Analyzed/summarized data made available?**	Yes
21	**Who uses this database?**	Fisheries managers, hatchery managers, and fisheries consultants
22	**Does Database generate maps?**	No
23	**Data exist as GIS coverage?**	No
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$170,000 GFS and federal
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Dedicated and state general funds
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission critical. It provides the basis for calculating survival of fish stocks and for assessing stock composition in mixed-stock areas.
27	**What enhancements should this database receive to increase its usefulness?**	Increased user accessibility would be useful where other coastwide (non WA) recoveries were not targeted.

Hatchery Production Planning Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**WDFW- Fish Program- Science Division- BDS**
2	**Database**	**Hatchery Production Planning**
3	**Database acronym**	Brood Document, Future Brood
4	**Provide an overview of the data content in this database**	Planned Hatchery Production; egg takes, transfers, plants, production, liberations
5	**Provide the name of the monitoring program(s) this database supports**	Brood Documents- Future and Current Performance Agreements- Measurement of compliance with FBD Puget Sound Salmon Management Plan
6	**Are there other databases that contain the same information? If so, which databases?**	No
7	**Is this database specifically identified by statute? What statute?**	PSMP- Co-managers agreement
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	No
10	**Frequency of data entry**	Daily
11	**Number of years database has been in operation?**	Database in use since 1992
12	**Does this database contain metadata describing content?**	No
13	**Where is this database located?**	One PC (Micron, Windows 1998)
14	**What is the basic architecture of the database**	Paradox for DOS
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary? Why?**	No
17	**Raw data made available?**	Yes- by request
18	**Data contact person**	Kelly Henderson- data steward
19	**Does this database generate reports? If so, what kind of reports**	Annual FBD (2 drafts, final) NOAA Projected Releases- FBD
20	**Analyzed/summarized data made available?**	Upon request, and posted http://wdfw.wa.gov/hat/reports/future_brood.htm
21	**Who uses this database?**	BDS staff
22	**Does Database generate maps?**	No
23	**Data exist as GIS coverage?**	No
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	52203 (approx. ¼ to 1/3 Bio 3 salary?) = $44K in GFS
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Dedicated
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High to Mission Critical Without accurate planning information agency cannot fulfill measurement objectives, tribal agreements, monitoring requirements
27	**What enhancements should this database receive to increase its usefulness?**	Accessibility to users, streamlined data entry, improved architecture, integrate or ability to compare with plants, provide management objective, mark/tag planning information

Hatchery Release Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**WDFW- Fish Program- Science Division- BDS**
2	**Database**	**Hatchery Spawning Eggtake**
3	**Database acronym**	Plants
4	**Provide an overview of the data content in this database**	Hatchery plants, production, liberations Hatchery Mark/Tag information
5	**Provide the name of the monitoring program(s) this database supports**	Brood Documents- Future and Current Performance Agreements- Measurements of production and releases Puget Sound Salmon Management Plan
6	**Are there other databases that contain the same information? If so, which databases?**	PSMFC- rolled-out release information
7	**Is this database specifically identified by statute? What statute?**	Pacific Salmon Commission? Data Sharing Agreement
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	No
10	**Frequency of data entry**	Daily
11	**Number of years database has been in operation?**	Dataset from 1994, historical release dataset from 1900 to 1994. Database in use since 2005
12	**Does this database contain metadata describing content?**	
13	**Where is this database located?**	Shared Drive T:/HatDB_Dev
14	**What is the basic architecture of the database**	Access Tables
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary? Why?**	No
17	**Raw data made available?**	Yes- by request or on PSMFC http://www.rmpc.org/
18	**Data contact person**	Kelly Henderson- data steward
19	**Does this database generate reports? If so, what kind of reports**	Plants summaries OFM Data Book Tables US-Canada Enhancement Reports CWT/Mass Mark Tables
20	**Analyzed/summarized data made available?**	Upon request. Summaries sent to Complex Managers and Regional Fish Program staff for review
21	**Who uses this database?**	BDS staff
22	**Does Database generate maps?**	No
23	**Data exist as GIS coverage?**	No
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	52203 (approx. ¼ to 1/3 Bio 3 salary?) plus 52209 (1/3 of costs) Est. $43,680 in GFS; $48,000 in PST funds =$91,680
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Dedicated
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High to Mission Critical Without accurate release information agency cannot fulfill measurement objectives, tribal agreements
27	**What enhancements should this database receive to increase its usefulness?**	Accessibility to users, streamlined data entry

Hatchery Returns Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**WDFW- Fish Program- Science Division- BDS**
2	**Database**	**Hatchery Returns**
3	**Database acronym**	Adults and Tickets (Form 3's)
4	**Provide an overview of the data content in this database**	Daily Hatchery adult and jack returns, rack counts, released to stream, mortalities, carcass distribution, mark/tag recoveries, transfers, adult plants Also includes spawn, egg takes (separate survey)
5	**Provide the name of the monitoring program(s) this database supports**	Audit of State Resources (eggs and carcasses) Distribution- Foodbank, Sold, landfill, etc. Stock status monitoring Mark and Tag Recoveries Performance Agreements- measurement of numbers of fish to Foodbank /Nutrient Enhancement
6	**Are there other databases that contain the same information? If so, which databases?**	No
7	**Is this database specifically identified by statute? What statute?**	No, however supports: Carcass Contract Chapter 220-74 WAC- Surplus salmon eggs Chapter 220-130 WAC Volunteer cooperative fish and wildlife enhancement program Chapter 220-140 WAC- Regional fisheries enhancement groups RCW 77.100.040 Cooperative projects — Sale of surplus salmon eggs and carcasses.
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	No
10	**Frequency of data entry**	Daily
11	**Number of years database has been in operation?**	Database in use since 1994. Current structure in use for over one year
12	**Does this database contain metadata describing content?**	No
13	**Where is this database located?**	Shared Drive T:/HatDB_Dev
14	**What is the basic architecture of the database**	Access Tables
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary? Why?**	No
17	**Raw data made available?**	Yes- by request. Adult returns available at PSMFC http://www.rmpc.org/
18	**Data contact person**	Mark Henry- data steward, or Catie Mains
19	**Does this database generate reports? If so, what kind of reports**	Annual Hatchery Escapement Report Annual Summary of Carcass Disposition Tables for Senator Morton OFM Data Book Tables US-Canada Enhancement Reports
20	**Analyzed/summarized data made available?**	Upon request. Escapement posted http://wdfw.wa.gov/hat/escape/escape.htm
21	**Who uses this database?**	BDS staff
22	**Does Database generate maps?**	No
23	**Data exist as GIS coverage?**	No
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	52203 (approx. 1/3 ST 3 salary, plus ¼ Bio 4) State Funds = $73K GFS
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Dedicated
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High to Mission Critical Without accurate return information agency cannot fulfill measurement objectives, tribal agreements
27	**What enhancements should this database receive to increase its usefulness?**	Accessibility to users, streamlined data entry, improved architecture

Puget Sound Sampling Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Puget Sound Sampling Databases** (in Microsoft Access): Recreational baseline database (catch and effort information) for salmon and marine fish; CWT and mark sampling databases from commercial and recreational fisheries; marine fish lengths and weights; Chum age composition; Chinook age composition.
3	**Contacts**	Doug Milward, Laurie Peterson, Karen Kloempken
4	**Program described in CMS survey?**	Yes (Harvest Monitoring)
5	**What department or division is it under?**	WDFW/Fish Program/Fish Management Division/Puget Sound Sampling Unit
6	**Purpose of the monitoring program including monitoring questions being answered**	Provide the historical time series needed for monitoring salmon and marine fish stocks and managing the salmon fisheries of the State. These databases provide recreational and commercial fisheries statistics for Puget Sound.
7	**Audience/customer/user**	Citizens of Washington State, NOAA Fisheries, Treaty Tribes, Pacific Fishery Management Council (PFMC), Pacific States Marine Fisheries Commission (PSMFC), Pacific Salmon Commission (PSC), International Pacific Halibut Commission (IPHC), other states.
8	**Authority**	
9	**Relates to watershed health and salmon recovery**	Documenting fishery-related impacts to salmon and marine fish stocks.
10	**Date monitoring program began or ended?**	Continuous monitoring in the areas and time periods that recreational and commercial fisheries are open in Puget Sound, every year.
11	**Type of monitoring**	Creel surveys at boat ramps throughout Puget Sound to collect catch and effort information, CWT recoveries from chinook and coho, mark rate information, and biological samples (DNA, lengths, weights) for salmon and marine fish caught in recreational fisheries. Test fishing is conducted in selective chinook and coho fisheries to determine encounter rates, mark rates, and collect biological samples for chinook (DNA, scales, lengths). In addition, in commercial fisheries we collect biological data (CWT's, mark sample information, sex determination, lengths) from coho and chinook. Scales are also collected from chinook in commercial and recreational fisheries, and from chum in commercial fisheries.
12	**Monitoring design**	Recreational baseline sampling: Angler interviews at primary public boat launch sites throughout Puget Sound via an opportunistic creel survey sampling design (sampling presence during hours of peak fishing effort), to supply species composition and CPUE information for the salmon catch record card system estimates. Sampling goals are 120 fish and 100 boats per time-area stratum, with a $\pm$ 10% level of precision per area at a 95% confidence interval. Special area fisheries and quota-managed fisheries require in-season estimates, typically based on the Murthy Estimator method, involving boat surveys to assess proportions of effort from sampled sites, random site selections for dockside sampling, and 100% (dawn to dusk) sampling coverage at selected sites on the randomly selected sampling days. During dockside interviews, samplers recover CWT's from chinook and coho that detect positive for a tag, and length measurements are also taken (10-20% sample rate is the goal for CWT samples in recreational fisheries). Scales and DNA samples are collected on all landed chinook. Commercial sampling: Sampling is opportunistic, wherever commercial landings take place. The sampling goal for CWT recoveries in commercial fisheries is 20% of the chinook and coho harvest per area per week. The sampling goal for chum age composition data is 200 chum per area, commercial fishery, week and gear type.
13	**Primary geographic focus**	All of Puget Sound marine waters.
14	**Are monitoring sites geospatially referenced?**	Yes, via GIS coverages of marine catch areas of Puget Sound and public boat ramps of Puget Sound.
15	**Does monitoring program provide data with known precision and certainty?**	Yes, variances around catch and effort estimates are calculated.
16	**Salmon Recovery Region(s)**	Puget Sound

17	**Frequency of sample collection**	Daily, or several days per week, in the areas and time periods that fisheries are open in Puget Sound, every year.
18	**What data are collected at sample sites**	Fishing effort, catch by species/area/boat type for salmon, marine fish and shellfish (crab and shrimp); CWT recoveries and mark information from salmon; scales from salmon for age analysis; and other biological samples (DNA, lengths, weights) from salmon and marine fish. Test fishing is conducted in selective chinook and coho fisheries to determine encounter rates, mark rates, and to collect biological samples for chinook (DNA, scales, lengths).
19	**Monitoring Program biennial cost and fund sources**	The Puget Sound Sampling Program has many different funding sources (up to 10 budget codes, consisting of approximately 50% federal and 50% state funds), with a total annual budget of about 1.2 million dollars.
20	**What is the name of the database(s) where these monitoring data reside?**	Puget Sound Sampling Databases: Recreational baseline database (catch and effort information) for salmon and marine fish; CWT and mark sampling databases from commercial and recreational fisheries; Chum age composition; Chinook age composition; marine fish lengths and weights.
21	**How often do you analyze, summarize, compile raw data?**	Summarize and compile weekly throughout the monitoring season, analyze annually.
22	**Report/publish data?**	Yes – Annual reports for Federal Aid in Sport Fish Restoration funding (DJ-Wallop Breaux); Annual reports presenting results from commercial fishery CWT sampling (PST funding); in-season estimate reports produced weekly throughout quota-managed fisheries; reports and data requests produced as needed throughout the year.
23	**Analyzed/summarized data made available?**	Yes – recreational catch and effort database, and marine fish biological data (e.g., lengths, weights), sent directly to RecFIN and posted on the Pacific State Marine Fisheries Commission (PSMFC) web site; data requests produced as needed.
24	**What is URL?**	http://www.psmfc.org/recfin for RecFIN data.
25	**Do other agencies collect data for this monitoring program? If so whom?**	Treaty tribes throughout Puget Sound help collect data from commercial salmon fisheries, including CWT recovery data, mark information, sex identification, scales, and lengths.
26	**Data readily available on maps?**	No
27	**Data exist as GIS coverage?**	Marine catch areas of Puget Sound are available as a GIS coverage; possibly public boat ramps in Puget Sound are in a GIS coverage (??).
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes –Our data are used in the preseason planning and the regulation-setting process with our co-managers, the Northwest Treaty Tribes, to establish Puget Sound fisheries. The Pacific Fisheries Management Council (PFMC), International Pacific Halibut Commission (IPHC), and NOAA Fisheries use our data for decisions regarding seasonal management of quota species (salmon, halibut) and other managed species (rockfish).
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission-critical. Without this monitoring, the fisheries in Puget Sound could not be prosecuted and significant opportunity and economic benefit would be lost. These fishery monitoring data are required to meet obligations with the Treaty Tribes under the Mass Marking Agreement and to maintain the integrity of the coastwide CWT database, provide marine fish catch estimates under the federal RecFIN contract, provide salmon catch estimates that are shared with the Treaty Tribes for fishery management purposes, and fulfill commitments under the Endangered Species Act administered by the National Marine Fisheries Service.

Ocean Sampling Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Ocean Sampling Program (OSP)**
3	**Contact**	Doug Milward, Wendy Beeghley
4	**Program described in CMS survey?**	Yes (Harvest Monitoring)
5	**What department or division is it under?**	WDFW/Fish Program/Fish Management Division/Ocean Sampling Program
6	**Purpose of the monitoring program including monitoring questions being answered**	Catch estimation and in-season quota monitoring of commercial troll and recreational ocean fisheries, coded wire tag (CWT) collection, biological sampling (DNA, tags, lengths, weights).
7	**Audience/customer/user**	Citizens of Washington State, NOAA Fisheries, Treaty Tribes, Pacific Fishery Management Council (PFMC), Pacific States Marine Fisheries Commission (PSMFC), Pacific Salmon Commission (PSC), International Pacific Halibut Commission (IPHC), other states.
8	**Authority**	
9	**Relates to watershed health and salmon recovery**	Documenting fishery-related impacts to salmon and marine fish stocks.
10	**Date monitoring program began or ended?**	March-October annually
11	**Type of monitoring**	Ocean-based catch and fishing effort, creel census
12	**Monitoring design**	Standard creel census with sampling levels adequate to provide estimates of common species with CV's <5% and to allow a minimum 20% CWT sampling rate
13	**Primary geographic focus**	WA ocean areas (US-Canada border – Cape Falcon, OR)
14	**Are monitoring sites geospatially referenced?**	
15	**Does monitoring program provide data with known precision and certainty?**	Yes, variances around catch and effort estimates are calculated
16	**Salmon Recovery Region(s)**	Coast
17	**Frequency of sample collection**	March – October, daily
18	**What data are collected at sample sites**	Fishing effort, catch by species/area/boat type, CWTs, PIT tags, spaghetti tags, lengths, weights, DNA samples
19	**Monitoring Program biennial cost and fund sources**	$1.42 million; 71% federal, 29% state general funds
20	**What is the name of the database(s) where these monitoring data reside?**	PSMFC RecFin database houses recreational catch estimates, internal OSP database houses raw sample data
21	**How often do you analyze, summarize, compile raw data?**	Summarize/compile weekly throughout monitoring season, analyze annually
22	**Report/publish data?**	Yes - PFMC Annual review, PSMFC Annual report, Washington State Annual Sport Report.
23	**Analyzed/summarized data made available?**	Yes, on RecFin database
24	**What is URL?**	http://www.psmfc.org/recfin
25	**Do other agencies collect data for this monitoring program? If so whom?**	Yes, OR Department of Fish and Wildlife for the area north of Cape Falcon; data is maintained separately by ODFW
26	**Data readily available on maps?**	No
27	**Data exist as GIS coverage?**	No
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes – PFMC, NOAA Fisheries, ODFW, IPHC. Decisions regarding in-season management of quota species (salmon, halibut) and other managed species (rockfish); preseason planning and regulation setting process for all ocean fisheries.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission-critical. Without monitoring of federally managed fisheries (which includes all ocean fisheries), fisheries could not be prosecuted and significant opportunity and economic benefit would be lost; data used to assess population status for salmon, halibut, and groundfish species would be lost or compromised.

LIFT Commercial Fish Tickets Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Commercial Fish Tickets**
3	**Database acronym**	LIFT
4	**Provide an overview of the data content in this database**	All commercial fishery products landed in Washington. Contains species, gear, area, numbers, pounds and other related data.
5	**Provide the name of the monitoring program(s) this database supports**	Harvest Monitoring
6	**Are there other databases that contain the same information? If so, which databases?**	No
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	No
10	**Frequency of data entry**	Normally twice weekly updates. Errors are corrected as they are found.
11	**Number of years database has been in operation?**	Since 1970
12	**Does this database contain metadata describing content?**	No
13	**Where is this database located?**	WDFW Olympia Headquarters
14	**What is the basic architecture of the database**	Relational database (Sybase)
15	**Charge money for the data?**	Sometimes (cost of media)
16	**Data sensitive or proprietary? Why?**	Some of the financial data is sensitive
17	**Raw data made available?**	Yes (non-sensitive fields only)
18	**Data contact person**	Lee Hoines or Mel Stanley, WDFW
19	**Does this database generate reports? If so, what kind of reports**	Not to the public. Ad-hoc reports available on demand
20	**Analyzed/summarized data made available?**	Yes, on demand
21	**Who uses this database?**	Users of commercial fish and shellfish harvest numbers, fishing effort, species composition, fisheries values.
22	**Does Database generate maps?**	No
23	**Data exist as GIS coverage?**	No
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$550K $357K GFS and $193K Fed/local
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	GFS is dedicated PacFin in Year by Year contract
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission Critical. Fish Ticket data are required to fulfill agency mandate to regulate commercial harvest and document state tax-related aspects of this commercial activity.
27	**What enhancements should this database receive to increase its usefulness?**	Needs to be moved from Sybase to SQL Server. New functionality required for Enforcement staff. Need to establish web data reports for public and other research staff. Need to explore electronic data capture at the time catch is landed.

Sport Harvest CRC Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington Department of Fish and Wildlife**
2	**Database**	**Washington Sport Harvest Estimates from Catch Record Cards (CRC)**
3	**Database acronym**	Sport CRC
4	**Provide an overview of the data content in this database**	Annual post-season harvest estimates of salmon caught by recreational anglers. The estimates are produced using the harvest reported on catch record cards.
5	**Provide the name of the monitoring program(s) this database supports**	Catch Record Card angler reporting project.
6	**Are there other databases that contain the same information? If so, which databases?**	None, unless they are derivatives of this database.
7	**Is this database specifically identified by statute? What statute?**	No.
8	**Is this database active?**	Yes.
9	**Geospatially referenced?**	No.
10	**Frequency of data entry**	Annual
11	**Number of years database has been in operation?**	16
12	**Does this database contain metadata describing content?**	No
13	**Where is this database located?**	Personal computer of CRC Project Manager.
14	**What is the basic architecture of the database**	SAS datasets, MS Access.
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary? Why?**	No
17	**Raw data made available?**	Yes
18	**Data contact person**	Susan Markey
19	**Does this database generate reports? If so, what kind of reports**	No
20	**Analyzed/summarized data made available?**	Yes
21	**Who uses this database?**	Statewide salmon managers, tribal fish managers, fishing public
22	**Does Database generate maps?**	No
23	**Data exist as GIS coverage?**	No
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$720K, GFS
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Dedicated funds
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission critical importance. Data provides basis for treaty/non-treaty allocations, sport/commercial allocations, and stock run sizes.
27	**What enhancements should this database receive to increase its usefulness?**	Increased public access to harvest estimates summaries

Forage Fish Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Forage Fish Database**
3	**Database acronym**	
4	**Provide an overview of the data content in this database**	The Forage Fish Database is part of the SSHIAP Program. The database provides a spatial representation of where important food fish of salmon are known to spawn in Puget Sound and coastal marine areas. Important attributes also include beach habitat characteristics and egg (spawn) density.
5	**Provide the name of the monitoring program(s) this database supports**	The Forage Fish database supports the forage fish status monitoring efforts.
6	**Are there other databases that contain the same information? If so, which databases?**	Some counties and tribes have limited forage fish information.
7	**Is this database specifically identified by statute? What statute?**	No. However, it has been identified in PSAT funding.
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	Varies
11	**Number of years database has been in operation?**	Data have been collected for nearly 30 years. In recent months, efforts to merge multiple datasets into a common Access database have been initiated.
12	**Does this database contain metadata describing content?**	Yes, after completion (estimated August 2006).
13	**Where is this database located?**	Olympia, NRB, Habitat Program, Science Division
14	**What is the basic architecture of the database**	GIS coverage migrating to a Personal Geodatabase as of 3/06. The parent database is MS Access.
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary?**	No
17	**Raw data made available?**	Yes. Maps are available digitally via CD and soon through Web Downloadable www.wa.gov/wdfw/hab/sshiap/index.htm or through Salmonscape: http://wdfw.wa.gov/mapping/salmonscape/index.html
18	**Data contact person**	Tracy Trople and David Price
19	**Does this database generate reports? If so, what kind of reports**	Not per se, although reports may be available upon request. One report has been generated – WDFW Tech Rept 79.
20	**Analyzed/summarized data made available?**	Hard Copy; Web Downloadable www.wa.gov/wdfw/hab/sshiap/index.htm and through Salmonscape: http://wdfw.wa.gov/mapping/salmonscape/index.html
21	**Who uses this database?**	County planners use this database extensively in planning ordinances and local regulations on marine shorelines. Restoration entities also use the data for nearshore restoration priorities.
22	**Does Database generate maps?**	Not per se, but maps can be generated to represent the data.
23	**Data exist as GIS coverage?**	Yes, migrating to more modern geodatabase by 6/06.
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$ 30K PSAT 0.1 FTEs $ GFF $ GFL
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Dedicated PSAT funding for FY 05/07.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High. Forage Fish are an important ecosystem species for salmon, and many other marine species including birds, mammals and other fish serving as their primary food source. Because forage fish spawning success is closely tied to nearby land use practices, this database provides local planning jurisdictions an important resource in the protection of salmon and salmon habitat.
27	**What enhancements should this database receive to increase its usefulness?**	Enhancements to the survey efforts will improve the database. Surveys of Puget sound will be nearly complete after this year culminating nearly 30 years of data, some of which may be outdated; continued sampling of Puget Sound beaches randomly through time will allow for trend monitoring of populations to occur.

Fish Passage Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Washington State Fish Passage and Diversion Screening Inventory Database (FPDSI).**
3	**Database acronym**	FPDSI, (formerly SSHEARbase)
4	**Provide an overview of the data content in this database**	FPDSI includes data compiled from several WDFW and non-WDFW barrier and screening inventory efforts. The data are statewide in scope but do not represent a comprehensive or complete inventory. Data are updated continually as inventory efforts are ongoing. The inventory efforts are intended to locate, identify, and prioritize correction of man-made fish passage barriers and improperly screened surface water diversions. Identifying and correcting fish passage barriers and improperly screened diversions are key components of salmon recovery. Fish passage barrier repairs are also included in the database.
5	**Provide the name of the monitoring program(s) this database supports**	Data support the status monitoring component of the State of the Salmon Report. Data also support the WSDOT monitoring of fish passage barriers on state highways.
6	**Are there other databases that contain the same information? If so, which databases?**	Local governments may have redundant information in their datasets for their geographic areas. The FPDSI is the most extensive database for fish passage barriers in Washington.
7	**Is this database specifically identified by statute? What statute?**	Internal; RCW 77.55.060; RCW 77.55.040; RCW 77.55.100
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	As data are obtained, they are entered.
11	**Number of years database has been in operation?**	10+
12	**Does this database contain metadata describing content?**	Yes
13	**Where is this database located?**	Olympia, NRB, Habitat Program, Science Division
14	**What is the basic architecture of the database**	MS SQL Server
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary?**	No
17	**Raw data made available?**	Yes
18	**Data contact person**	Brian Benson or David Price
19	**Does this database generate reports? If so, what kind of reports**	Annually, or as needed
20	**Analyzed/summarized data made available?**	Annually, or as needed
21	**Who uses this database?**	WDFW and WSDOT use the data to identify fish passage barrier correction projects, particularly those of a high-risk nature. Lead Entities and restoration groups use the data to prioritize projects to maximize restoration money. The data are also used to track where inventory efforts have occurred.
22	**Does Database generate maps?**	Not per se, but data are made available through WDFW's on-line mapping site – Salmonscape. Also, custom maps are available upon request.
23	**Data exist as GIS coverage?**	Yes
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$273,000 total ($237,000 GFS, $36,000 WSDOT contract). 1.7 FTEs
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Funding is 90% dedicated, 10% recurring WSDOT contract.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Critical. The FPDSI database is essential to salmon recovery groups and Lead Entities. It provides the opportunity to prioritize from among hundreds of restoration projects, which allows limited funding to provide greatest benefit for salmonid recovery. The database also provides information necessary to measure the success of recovery efforts by monitoring the successful implementation of fish passage barrier removals. Status of fish passage barrier removal projects are reported biennially in the State of the Salmon Report.

Hydraulic Project Approval Compliance Monitoring

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Monitoring Program Name**	**Hydraulic Project Approval Compliance Monitoring**
3	**Contact**	Tim Quinn?; Gayle Kreitman
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Enforcement Program and Habitat Program
6	**Purpose of the monitoring program including monitoring questions being answered**	The purpose of the monitoring program is to determine if persons working within the waters of the state are in compliance with the provisions of their permit and have implemented the project as designed and approved
7	**Audience/customer/user**	DFW Biologists, Enforcement Officers, Habitat Program Managers
8	**Authority**	RCW 77.55
9	**Relates to watershed health and salmon recovery**	Yes Addresses protection of stream riparian zones and instream habitat for all species
10	**Date monitoring program began or ended?**	Some level of HPA compliance monitoring has occurred since HPAs have been issued; HPA database goes back to 1989
11	**Type of monitoring**	Compliance monitoring
12	**Monitoring design**	No real design; Pol 5212 HPA Compliance Monitoring is the guidance
13	**Primary geographic focus**	Statewide
14	**Are monitoring sites geospatially referenced?**	Limited Latitude/Longitude data; referenced by Section/Township/Range, WRIA, County
15	**Does monitoring program provide data with known precision and certainty?**	Results are site-specific based on HPA
16	**Salmon Recovery Region(s)**	All
17	**Frequency of sample collection**	Target is 100% Priority 1 HPAs, 50% Priority 2 HPAs and Priority 3 HPAs as able
18	**What data are collected at sample sites?**	No sample sites; monitoring based on sites HPAs were issued. May also include sites where unpermitted work occurred
19	**Monitoring Program biennial cost and fund sources**	$0; no dedicated funding, monitoring occurs as part of job duties
20	**What is the name of the database(s) where these monitoring data reside?**	None yet, but in process of building compliance component of the Hydraulic Permit Management System database
21	**How often do you analyze, summarize, compile raw data?**	Habitat Program staff submit number of compliance site visits made on a monthly basis.
22	**Report/publish data?**	Data is reported as a performance measure of the strategic plan
23	**Analyzed/summarized data made available?**	Yes, as quarterly performance report for strategic plan
24	**What is URL?**	Not on web to my knowledge
25	**Do other agencies collect data for this monitoring program? If so whom?**	Not directly. Other agencies may report compliance problems for our follow-up
26	**Data readily available on maps?**	No
27	**Data exist as GIS coverage?**	No
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Only if a compliance issue on a project permitted by other agencies
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	At least high, if not mission critical. The HPA program is our only regulatory tool to protect fish and fish habitat. We issue on average 4,000 HPAs annually for work that impacts habitat if not done as permitted. Habitat loss from non-compliance can be significant.

Hydropower Effectiveness Monitoring Program

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Monitoring Program Name**	**Hydropower Effectiveness Monitoring**
3	**Contact**	Curt Leigh
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Habitat Program – Major Projects Division
6	**Purpose of the monitoring program including monitoring questions being answered**	Monitors the effectiveness of various hydropower facilities in meeting mitigation requirements necessary for salmon and trout survival. Major areas of interest are flow constraints and fish passage.
7	**Audience/customer/user**	Monitoring Oversight Committee (MOC) – Salmon Scorecard
8	**Authority**	MOC request
9	**Relates to watershed health and salmon recovery**	Assessment of each hydro project's performance across a broad range of hydro power indicators.
10	**Date monitoring program began or ended?**	A "point in time" assessment was completed in November 2001.
11	**Type of monitoring**	Effectiveness monitoring
12	**Monitoring design**	The "point in time" assessment was based on direct staff experience with the projects.
13	**Primary geographic focus**	Statewide
14	**Are monitoring sites geospatially referenced?**	No
15	**Does monitoring program provide data with known precision and certainty?**	No funding is available for a monitoring program. The "point in time" assessment is anticipated to be revisited on a ten year cycle to monitor overall progress towards fish friendly operation.
16	**Salmon Recovery Region(s)**	All
17	**Frequency of sample collection**	There is continual program involvement with the projects. We anticipate assembling the data on a ten year cycle.
18	**What data are collected at sample sites?**	See criteria on Table 17 (pages 165-167) of "Comprehensive Monitoring Strategy for Watershed Health and Salmon Recovery."
19	**Monitoring Program biennial cost and fund sources**	$None currently available. An actual effectiveness monitoring program could be implemented for less than $500K per biennium.
20	**What is the name of the database(s) where these monitoring data reside?**	Scorecard.xls
21	**How often do you analyze, summarize, compile raw data?**	A ten year cycle was anticipated.
22	**Report/publish data?**	Unpublished data
23	**Analyzed/summarized data made available?**	Provide to MOC
24	**What is URL?**	n/a
25	**Do other agencies collect data for this monitoring program? If so whom?**	Water Quality components were provided by Department of Ecology.
26	**Data readily available on maps?**	no
27	**Data exist as GIS coverage?**	no
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Information regarding the effectiveness of various hydropower facilities in meeting life requirements for salmon and steelhead is used by FERC in making license decisions and by Ecology in making 401 Certification decisions.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Continual involvement with the major hydro projects and their owners to improve fish friendly operation of the projects is a critical component of agency business. The "point in time" compilation of the monitoring criteria was for the Comprehensive Monitoring Survey.

Intensively Monitored Watersheds Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Intensively Monitored Watersheds Database**
3	**Database acronym**	IMW Database
4	**Provide an overview of the data content in this database**	The IMW database is part of the SSHIAP Program. IMW data are used to support the intensive monitoring efforts that are underway in 10 study streams of Western Washington. Data include smolt and adult salmon abundance data, EMAP habitat data, extensive habitat survey data and ambient environmental data.
5	**Provide the name of the monitoring program(s) this database supports**	Intensively Monitored Watersheds studies, a SRFB funded project.
6	**Are there other databases that contain the same information? If so, which databases?**	No.
7	**Is this database specifically identified by statute? What statute?**	No.
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	As information is collected.
11	**Number of years database has been in operation?**	1
12	**Does this database contain metadata describing content?**	Yes
13	**Where is this database located?**	Olympia, NRB, Habitat Program, Science Division
14	**What is the basic architecture of the database**	MS Access, Personal Geodatabase
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary?**	No
17	**Raw data made available?**	Yes.
18	**Data contact person**	Kevin Samson and David Price
19	**Does this database generate reports? If so, what kind of reports**	Data summaries are generated as needed and made available through the Northwest Information Portal (available after 5/06)
20	**Analyzed/summarized data made available?**	Yes.
21	**Who uses this database?**	IMW data are used by researchers to improve our understanding of how restoration treatment effects influence salmon productivity. The data are used by managers to gauge the effectiveness of restoration actions and to prioritize limited salmon recovery funding.
22	**Does Database generate maps?**	No
23	**Data exist as GIS coverage?**	IMW data are spatially explicit and can be displayed on maps
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$ 120K GFS 1.0 FTEs $ GFF $ GFL
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	These funds are earmarked by the IMW Oversight Committee, which reports to the SRFB annually.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High. Without an IMW database, the IMW studies would not be able to respond to salmon recovery questions posed by the SRFB and Governor's Forum on Monitoring.
27	**What enhancements should this database receive to increase its usefulness?**	The database is about 1 year new. No enhancements are envisioned at this time.

SSHIAP Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Salmon and Steelhead Habitat Inventory and Assessment Program**
3	**Database acronym**	SSHIAP
4	**Provide an overview of the data content in this database**	SSHIAP is a partnership-based information system designed to characterize the distribution and habitat conditions of salmonid stocks in Washington at the 1:24,000 scale. The SSHIAP system delineates streams and estuary/nearshore marine waters into segments based on physical characteristics and habitat types. These segments provide a consistent spatial framework for integrating a wide variety of habitat information and subsequent analyses. The SSHIAP system quantitatively characterizes habitat conditions, maps stock distribution and status, and links habitat conditions and stock distribution with productivity modeling efforts. SSHIAP is designed to provide these data in map and digital formats for statewide, ESU, watershed, and local planning and conservation actions.
5	**Provide the name of the monitoring program(s) this database supports**	In addition to being a database of habitat attributes, SSHIAP directly supports other databases within WDFW. Intensively Monitored Watershed (IMW) database; the fish passage barrier and barrier repair database, and irrigation screening database (FPDSI); Ecosystem Diagnosis and Treatment (EDT); and State of the Salmon Report Habitat Indicators.
6	**Are there other databases that contain the same information? If so, which databases?**	SSHIAP is shared with the Northwest Indian Fisheries Commission, which has a similar database for Puget Sound and coastal WRIAs 1-23.
7	**Is this database specifically identified by statute? What statute?**	RCW/WAC ESB 6188; SSB 5595; SSB 5637; SSB 2496; SSB 2514
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	Varies
11	**Number of years database has been in operation?**	5
12	**Does this database contain metadata describing content?**	Yes
13	**Where is this database located?**	Olympia, NRB, Habitat Program, Science Division
14	**What is the basic architecture of the database**	GIS, Personal Geodatabase
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary?**	No
17	**Raw data made available?**	Yes. Hard Copy; Web Downloadable www.wa.gov/wdfw/hab/sshiap/index.htm
18	**Data contact person**	Tracy Trople and David Price
19	**Does this database generate reports? If so, what kind of reports**	Not per se, although reports may be available upon request.
20	**Analyzed/summarized data made available?**	Hard Copy; Web Downloadable www.wa.gov/wdfw/hab/sshiap/index.htm and through Salmonscape: http://wdfw.wa.gov/mapping/salmonscape/index.html
21	**Who uses this database?**	SSHIAP delivers data and summary statistics to a wide range of users. The predominant audience is natural resource managers, data programs, scientists, and groups involved in the recovery planning, restoration, monitoring and mitigation of aquatic systems in Washington. This reflects users from local, county, state, tribal, federal and NGO jurisdictions.
22	**Does Database generate maps?**	No
23	**Data exist as GIS coverage?**	Yes, data are modernized to a geodatabase
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$ 140,317 GFS 1.0 FTEs $ GFF $ GFL
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Dedicated.
26	**How would you rank the importance of this**	High. SSHIAP is the primary vehicle from which fish habitat

	database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?	and salmon recovery data are maintained and distributed. SSHIAP also provides a template of fish and habitat data from which coarse-scale models of salmonid productivity are derived. Lastly, SSHIAP is the root database behind Salmonscape, the Agency's primary vehicle to route salmon habitat information to the public.
27	**What enhancements should this database receive to increase its usefulness?**	LiDAR would improve the accuracy of the state's hydrography layer on which all SSHIAP attributes are appended; including fish distribution, and barrier data. More rapid conversion of the state's hydrography data to match federal standards (NHD) would improve the transferability of SSHIAP data to regional interests. Improved natural barrier data could make model predictions of fish habitat more precise. Impervious surface attributes and hydromodifications (dams, levees, bank armoring) could be added to SSHIAP with greater statewide access to more frequently with the availability of high resolution digital orthophotos.

Fish Age Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Age Database**
3	**Database acronym**	Age
4	**Provide an overview of the data content in this database**	This database holds scale-based age readings, hatchery/wild origin determinations, and other information from individual salmon and steelhead sampled in commercial and sport fisheries, hatchery racks, and natural escapement.
5	**Provide the name of the monitoring program(s) this database supports**	Dong Nguyen - 360-902-2824 nguyedqn@dfw.wa.gov
6	**Are there other databases that contain the same information? If so, which databases?**	No
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Sampling sites are identified by standard codes derived from the PSC Location code system, part of which contains a Stream Catalog code (for freshwater sampling). The effort to build a cross-reference between GIS stream ID (LLID) and Stream Catalog code is not complete.
10	**Frequency of data entry**	4-6 times per year, as each major fishery batch is processed by the Scale Lab.
11	**Number of years database has been in operation?**	This database was created in 2005, but it contains data from 1980 to present.
12	**Does this database contain metadata describing content?**	No
13	**Where is this database located?**	WDFW Headquarters, NRB, Olympia WA. Main repository exists in MS Access on the data steward's computer; a derivative (working) copy is maintained on a network drive.
14	**What is the basic architecture of the database**	Visual Basic for Applications (VBA) is the basic software architecture behind this MS Access database.
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary? Why?**	No
17	**Raw data made available?**	Yes: via e-mail, printed lists, CD-ROM
18	**Data contact person**	Dong Nguyen 360-902-2824 nguyedqn@dfw.wa.gov
19	**Does this database generate reports? If so, what kind of reports**	Yes - Flexible report are created by user at run-time
20	**Analyzed/summarized data made available?**	Analyzed/summarized data made available in Excel, Access, Word, Text formats.
21	**Who uses this database?**	State, Federal, Tribal, Multi-jurisdictional County, City, Academic, Private/Volunteer/Non profit
22	**Does Database generate maps?**	No
23	**Data exist as GIS coverage?**	No
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$14K WFS
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	No
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High Age composition in fisheries and escapements helps produce the brood year component of annual adult contribution, thus allowing brood year-based analyses of return strength.
27	**What enhancements should this database receive to increase its usefulness?**	Should create website interface for data entry and to provide public access to data and reports.

Genetics Lab Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Genetics Lab Database System – still in development**
3	**Contact**	Ken Warheit (Lab Director), Denise Hawkins (Lab Manager)
4	**Program described in CMS survey?**	Yes, to a limited degree. The WDFW Genetics Lab collects genetic data on fish and wildlife populations, individuals, captive breeding systems (e.g., hatchery programs, or enhancement projects), and forensics-law enforcement related samples or evidence
5	**What department or division is it under?**	Science Divisions in both the Fish Program (9.5 FTE) and the Wildlife Program (0.5 FTE)
6	**Purpose of the monitoring program including monitoring questions being answered**	(1) to ascertain the geographic structure of fish and wildlife populations using genetic data (e.g., determine number of stocks, and the spatial distribution within a defined geographic area). This provides essential data for ESA issues and to help set hunting or fishing (recreational or commercial) limits; (2) help design and determine efficacy of captive breeding systems such as for endangered species recovery or for production (e.g., salmonid hatcheries). This would include studies such as parentage analysis; (3) identify species or population of origin of individual samples for injury assessments following natural or anthropogenic disturbances, or as evidence in law enforcement-related cases (includes genotyping or genetic fingerprinting of individuals); (4) to determine to what degree individuals are hybrids or introgressed between two or more populations/species; (5) mixed-stock fishery analysis; (6) others
7	**Audience/customer/user**	Fish and wildlife managers, other scientists, general public
8	**Authority**	No specific statutory requirements.
9	**Relates to watershed health and salmon recovery**	Yes. Major focus of our efforts relate to salmon recovery, especially through the understanding of geographic structure of stocks (e.g., helps define SaSI stocks), genetic introgression of hatchery and wild fish, and mixed-stock fisheries analysis to help determine exploitation rates of listed stocks.
10	**Date monitoring program began or ended?**	The genetics lab operations are on going, and not specific to any individually defined monitoring program.
11	**Type of monitoring**	Genetic
12	**Monitoring design**	Except for hatcheries, genetic monitoring usually entails a single collection of a limited number of individuals (up to perhaps 200) for a specific location. Hatcheries and some wild stocks may be sampled over a series of years to determine temporal stability of the genetic composition of the stocks.
13	**Primary geographic focus**	Washington State
14	**Are monitoring sites geospatially referenced?**	Some - incomplete, not with specific coordinates. Fish collections are usually identified by area, by entire WRIA or WRIA stream codes, specific hatchery, or commercial fishing areas. Many wildlife samples are identified by geographic coordinates such as lat/long, or UTM, or by area such as GMU
15	**Does monitoring program provide data with known precision and certainty?**	Genotyping errors can be quantified, but are generally not reported. Population assignments are assessed through statistical analysis and are reported with probabilities, and therefore an assessment of error.
16	**Salmon Recovery Region(s)**	Statewide
17	**Frequency of sample collection**	On going, and throughout year. Laboratory adds several thousand of samples each year, and genotypes tens of thousands of samples per year
18	**What data are collected at sample sites**	DNA tissue samples are collected, along with date, geographic locality (defined at various levels of spatial accuracy), collector, collection process, etc. Biological data such as linear measure-ments may also be collected, but this is not done on a routine basis
19	**Monitoring Program biennial cost and fund sources**	$200k GFS and 800K GFF/GFL The Genetics Laboratory is supported directly by a combination of State General Funds, and Federal Funds (e.g., Pacific Salmon Treaty), but mostly through local (grants – mostly Federal) or interlocal (other agencies or Tribes) Funds. The lab spends roughly $900,000 - $1,000,000

		per year on all efforts, including field collection of DNA samples and laboratory processes, statistical analysis, report and manuscript preparation, administration, and travel.
20	**What is the name of the database(s) where these monitoring data reside?**	Genetics Lab Database System – still in development
21	**How often do you analyze, summarize, compile raw data?**	Daily – on-going
22	**Report/publish data?**	Generally, the results of all or nearly all genetic analyses are available as unpublished reports or published documents
23	**Analyzed/summarized data made available?**	Yes
24	**What is URL?**	WDFW network computer : http://genetics.dfw.wa.gov/geneticslab/
25	**Do other agencies collect data for this monitoring program? If so whom?**	Yes, many other DNA laboratories collect genetic data on Washington fish and wildlife species. Included are NMFS, USFWS, CRITFC, and university labs. Generally, there is excellent communication among laboratories and there is rarely duplication of efforts
26	**Data readily available on maps?**	No
27	**Data exist as GIS coverage?**	No
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes – fishery management; hatchery management; captive breeding of federally listed endangered wildlife
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission Critical – for the most part the primary source of population genetic data for trust fish and wildlife resources are provided by the WDFW Genetics Laboratory. Genetic data provide an essential component to the management of trust resources

Invasive Species Monitoring

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Monitoring Program Name**	**Invasive Species Monitoring**
3	**Contact**	Scott S. Smith / Pamala Meacham
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	Fish Program/Fish Management Division
6	**Purpose of the monitoring program including monitoring questions being answered**	Monitors certain tunicate species, green crab, mitten crab, zebra mussel, and other invasive species to evaluate: potential economic impacts, competition with native species, and efforts intended to prevent or control their spread.
7	**Audience/customer/user**	Other agencies, NGO's, Tribes, various industry reps.
8	**Authority**	RCW77.60.110; WAC 232-12-016(2) (c); RCW77.60.130; RCW77.12.020; RCW77.12.875; RCW77.12.878; RCW 77.120; RCW 77.12.879.
9	**Relates to watershed health and salmon recovery**	Yes. Addresses protection of marine and freshwater ecosystems and the impact of non-native species
10	**Date monitoring program began or ended?**	European Green Crab monitoring in Puget Sound began in 1999. WDFW contracted with Adopt a Beach in 1999 and 2000 for the monitoring. In 2001 the agency contracted with Puget Sound Restoration Fund who subcontracted with Nahkeeta Northwest to take over the training and management of the volunteer monitoring program. The program is ongoing. European green crab monitoring by WDFW in coastal areas began in 1998, and funding was discontinued in 2003. Dr. Sylvia Yamada has continued surveying and research in outer coastal areas, with funding from Pacific States Marine Fisheries Commission, and provides results to WDFW. Her work is ongoing, along with volunteer efforts done cooperatively with tribal and commercial efforts. Zebra Mussel Monitoring in high use freshwater lakes and all along the Columbia River began in 1999 and is ongoing. There are approximately 70 sites monitored with "substrate -samplers" that are organized by Portland State University staff. In addition each summer 'veliger' sampling is done in high use lakes and all along the Columbia and parts of the Snake River by WDFW in cooperation with other partners. Surveys of recreational boaters/anglers are also conducted as a part of a zebra mussel prevention and early detection program. WDFW has hired staff in 2001 and 2004 to visit boat launches at high use lakes and rivers to inspect watercraft, distribute educational literature about invasive aquatic weeds, zebra mussels and other invasive species, and to collect information regarding other areas the boaters use – particularly if they visit infested areas out of state. Commercially hauled vessels have been inspected by the WSP at the ports of entry since 2000. Those inspections were reduced after 9/11 due to increased Homeland Security measures. However, the Legislature has provided funding specifically for these surveys and outreach efforts to be resumed on a larger scale in 2006. Atlantic Salmon monitoring. In 2003 the Pacific States Marine Fisheries Commission began funding WDFW to undertake snorkel and foot surveys for Atlantic salmon juveniles and adults. The surveys are ongoing. New Zealand mud snail surveys. Mud snails are spreading in the Columbia, Snake, and Lewis rivers. Due to their tiny size, the snails are easily spread. WDFW staff conducting Atlantic Salmon surveys and recreational boating surveys, are also looking for the snails at the sites they visit. Ballast Water Monitoring of commercial vessel ballast discharges in Puget Sound. WDFW began boarding commercial vessels to verify record keeping and compliance with the State Ballast Water Law in June of 2004. A single vessel inspector was hired to conduct the inspections and to obtain samples of the vessel's ballast water. The samples are analyzed by the University of Washington to determine the efficacy of open ocean exchanges that have been conducted to minimize the presence of coastal species that could become invasive if introduced into state waters. There is hope that the project could lead to the development of a standard method to evaluate exchanged ballast water. This program has been very effective since compliance with the law is increasing, and there are fewer nonnative

		coastal species being found in ballast water. Monitoring and Control program for invasive tunicate species. Three highly invasive tunicate species have been found in the inner marine waters of Washington. In 2005 WDFW contracted with Washington Sea Grant to develop a "watch" program using recreational divers, and to educate the divers on how to identify the species. They also contracted with an expert on tunicates to positively identify the species when located. Clusters of the species have been identified at five marinas, and in some aquaculture sites, primarily in north Puget Sound. Emergency funds have been allocated to begin cleaning boats and docks at three heavily infested marinas, and to survey for further infestations. Additional legislative funding is proposed to continue these efforts. WDFW is working with a variety of local experts to develop control methods, as well as agencies in New Zealand and Prince Edward Island who are also dealing with these species.
11	**Type of monitoring**	Presence/absence, density estimates and baseline data to verify the efficacy of control methods.
12	**Monitoring design**	European green crab monitoring in Puget Sound is conducted by volunteers who use crayfish traps secured to the substrate with rebar or pencil rod. The traps are baited with cat food. Every trap is tagged with a plastic tag. Monitors must check the traps every 24 hours, and the traps are set in a manner to ensure the survival of non-target species at low tide. The ANS program recently provided replacement traps, extra trap clips, and several hundred tags and ties. Volunteers fill out forms for each trapping effort. At the end of the season the forms are sent to WDFW for entry into an Access database. The database is sent to Nahkeeta NW for mapping. The same volunteers also monitor for Spartina while in the field. All volunteers operate under a group scientific permit. 100 trained volunteers average 4,000 hours of sampling effort, resulting in approximately 600 trapping records annually. European green crab monitoring in coastal areas. WDFW staff and volunteers have used pit traps and are finding that bundles of oyster shells, which provide a lot of good cover for juvenile crab, draw the crab in and are providing good results. There is no funding allocated for WDFW to continue this project, but efforts are ongoing with funding from Pacific States Marine Fisheries Commission. Zebra Mussel monitoring. Portland State University created several hundred "substrates" consisting of a length of 2.5" perforated pipe packed with netting and distributed them to several waterfront residents throughout the state. PSU sends out reminder cards, which the monitors fill-out and return. Veliger sampling is conducted by biologists from tribes, PUD's, the Dept of Ecology and WDFW. Plankton samples are collected using a 54-micron net, preserved with alcohol, and submitted to a lab that specializes in zebra mussel identification for analysis. Survey records and sample analyses results are maintained in Excel spreadsheets. On occasion, staff that conduct recreational boater surveys also collect veliger samples. Recreational boater surveys have been conducted at high use boat launches as funding allowed. Opening day crowds, fishing tournaments, and popular recreational boating/fishing sites are targeted. Boaters are contacted, provided with information on invasive species and state laws against having aquatic plants on boats or trailers being hauled on state roads. Inspections are conducted under protocols provided by the 100th Meridian Initiative, and inspection information is forwarded to them to be included in the national risk analysis database. Legislation passed in 2005 now mandates recreational boating surveys, and surveys of commercially hauled boats by WSP. This new effort will begin in the spring of 2006. Atlantic salmon surveys are conducted by WDFW technicians. Snorkeling teams "float" downstream looking for juvenile and/or adult Atlantic salmon. Some of the team members received special training in B.C. to identify Atlantics. When observed, Atlantics are captured using hook and line or a net. Foot or float boat surveys are conducted where waters are too shallow to snorkel, and in other waters during spawning season seeking returning/spawning adults. Surveys are conducted year around. Data is entered into an access database. New Zealand mud snail surveys currently consist of close observation of shoreline substrate for the presence of the snails. This is done in conjunction with Atlantic Salmon and recreational boater surveys.

		Ballast Water Monitoring in Puget Sound. Presently approximately 5% of commercial vessels arriving in Puget Sound are boarded and inspected. The program primarily targets vessels that commonly carry water from infested bays in California, which pose a high risk of introducing invasive species. About 20% of inspections are done on low-risk vessels selected at random. The inspector boards the vessels, reviews deck, pump, and maintenance logs and compares them with data reported to the state on the vessels ballast water form to verify the accuracy of the report. Samples are taken from some of the ballast tanks, for analysis by the University of Washington. WDFW also provides samples to EPA and USGS for research projects that are designed to develop better methods of monitoring ballast discharges. Strict sampling protocols, sample custody and retention rules are followed by the inspector and the University. This program is coordinated with the Department of Ecology Spill Team inspectors and the U.S. Coast Guard inspectors. Inspection and sample records are maintained in an Access database. Tunicate monitoring. WDFW, PSAT and Washington Sea Grant (WSG) have worked together to develop a volunteer monitoring program for recreational divers. WSG has a web based reporting system and paper reporting forms are available for participating divers to record the results of a dive. Divers are asked to report either the presence or absence of invasive tunicates. We are working with various contractors to develop reliable, fast, economically feasible survey methods. Some surveys will be conducted from dockside, using underwater cameras. Others may be conducted using divers.
13	**Primary geographic focus**	Statewide for zebra mussels and New Zealand mud snails. Confined to western WA streams and rivers for Atlantic Salmon. European green crab monitoring and tunicate surveys cover Puget Sound. Ballast discharge monitoring is conducted in Puget Sound. Recreational boats are monitored for the presence of invasive species state-wide.
14	**Are monitoring sites geospatially referenced?**	Yes, for all programs. However there are no mapping creation (GIS) capabilities available at this time. An electronic tracking system linked to the databases is needed to follow and map changes in monitoring efforts.
15	**Does monitoring program provide data with known precision and certainty?**	The European green crab monitoring program, managed by Nahkeeta Northwest provides presence/absence data for the green crab at various sample sites in Puget Sound. As of January 22, a grand total of four hundred sixty two snorkel and spawning surveys have been completed in one hundred and forty-two streams and rivers. In the first year several hundred juvenile Atlantics were observed in Scatter Creek, 109 were captured. Scale, otolith, and DNA samples are taken to determine if juvenile Atlantic salmon are from hatchery or natural reproduction sources. Ballast water monitoring evaluates the percentage of coastal vs. oceanic species found in ballast samples to evaluate the effectiveness of ballast exchange. Zebra mussel monitoring provides presence/absence data for adult and veliger life stages. Monitoring for invasive tunicates has provided presence/absence data and future data will estimate densities.
16	**Salmon Recovery Region(s)**	All
17	**Frequency of sample collection**	European green crab monitors work from April through September. Zebra mussel veliger samplers work from May through September when the volunteers are available. Each site is sampled once a month for three to four months, where possible. At some sites only one sample a year is taken. Atlantic salmon monitoring is year around, with snorkel surveys conducted when weather and water conditions allow, and foot/float boat surveys conducted when waters are turbid and during spawning seasons to avoid disturbing salmon redds. Currently there is only one team working four days a week. Next year the contract funding will be further reduced, and one team will work two and occasionally three days a week. Recreational boater surveys are conducted from late April or early May through late September or early October. In the past one employee conducted up to 1,500 surveys over the season. We anticipate using up to 3 FTE's for five to six months.

		Commercially hauled boat inspections by the WSP at the ports of entry are conducted year around. Ballast Water Monitoring Approximately, 190 vessels are surveyed per year. Invasive tunicate surveys will be conducted with funding from the supplemental budget and a sampling plan is under development.
18	**What data are collected at sample sites?**	European green crab survey forms report the name and contact information of the volunteer, trap location, number of traps set, the date and time set and retrieved, and the Seattle low tide time for each, and what bait was used. The forms also report the shoreline type, substrate type, and vegetation present as well as catch information for crab species trapped. Catch information includes male or female crab or molts for green crab, and six other specific crab species. A figure on identifying and measuring green crab, and a space for comments/bycatch. Atlantic salmon survey forms include the date, stream name, county, survey method used, staff names, start and end time. Start and end locations (GPS), water temperature, visibility, water level, weather. A section for any Atlantics observed including whether they are fry, parr, smolt, or adult, location, number of fish observed, size class, and habitat type. There is also a section for general comments where staff list all species of fish observed during the survey. Scale, otolith, and DNA samples are taken to determine if juvenile Atlantic salmon are from hatchery or natural reproduction sources. Zebra mussel samples include Initials of the sampler, date, time, waterbody, site description (volunteers provide a list of specific sites, along with GPS coordinates), water temperature, and wind direction/speed. Recreational boating surveys collect information about where the boats have been launched in the past year, where else they intend to launch that season, whether the owner cleans the boat between launches, and whether the owners are aware of the threat of invasive species. Information is shared with the 100th Meridian Initiative group for a national risk assessment project. Ballast water monitoring data includes a review of the vessels logs to verify compliance and data on the presence of coastal and oceanic species found in a plankton sample taken from the ballast tank.
19	**Monitoring Program biennial cost and fund sources**	$170,000 in state funds has been allocated for ANS/Ballast Water. These funds cover the salary and benefits of the coordinator (bio4), approximately a quarter of the salary and benefits of an assistant coordinator (bio3) and $24,000 in contracts for green crab monitoring. The program receives USFWS funding for implementation of the state plan. This amount varies annually depending upon the number of states applying. In July 2005 the program received $70,303 to cover the remainder of the assistant coordinators salary, 1 FTE for data entry, a portion of the vessel inspectors salary that was not covered by other grants, outgoing contracts with Sea Grant and UW, travel expenses, telephone, and other overhead costs for all of the staff. USFWS is providing a new grant of $57,600 to be spent in the same manner, we anticipate receiving the funds by July 2006. A grant from the Department of Ecology covered the Vessel Inspectors salary and some of his vehicle costs in the 03-05 biennium. Approximately $8,200 (plus overhead) was applied in the 2005-2006 biennium. An additional contract from EPA to collect samples @ $133.00 each is currently paying a portion of the inspectors salary and benefits. The funds will be depleted in late summer of 2006 and WDFW does not anticipate additional funding from EPA for this purpose. We anticipate $40,000 from Pacific States Marine Fisheries to cover salary and benefits for the inspector from July 2006 – December 2006. A contract from Pacific States Marine Fisheries Council for $140,000 covers the Atlantic salmon surveys from July 1, 2005 through June 30, 2006. We anticipate a new contract for $100,000 to cover a reduced program July 2006-June 2007. The agency has been awarded $75,000 in emergency funds to begin monitoring and control efforts on invasive tunicates. The funds will be available in March. An additional $175,000 from the supplemental budget is expected to continue monitoring and control activities. The 2005 Legislature passed legislation that added an additional fee

		onto recreational boat licenses. $1.50 of that fee goes to the ANS project to develop an aquatic invasive prevention program for recreational watercraft. This includes inspection of watercraft and trailers at selected boat launches, educating general law enforcement officers on how to enforce state laws relating to the spread of invasive species, to evaluate the risk posed by marine recreational watercraft and float planes in spreading invasive species in state waters, partial funding to begin to implement an early detection and rapid response plan, train WSP employees at ports of entry to inspect commercially hauled boats and to set up joint random inspection stations in areas of high boating activity. We anticipate making our half time data entry person full time, hiring a bio 2 to oversee field operations, 3 or more science-technicians to conduct surveys, and one full time enforcement officer to assist in educating other enforcement officers and participate in check-point operations. These funds will also contribute approximately one third of management level salaries, and cover the purchase of computers and other necessary equipment to complete the tasks outlined in RCW77.12.879.
20	**What is the name of the database(s) where these monitoring data reside?**	Green crab, zebra mussel, ballast water, and Atlantic Salmon databases for each year are maintained by Pam Meacham and reside on her computer and a supplementary back up drive, as well as on CD backups.
21	**How often do you analyze, summarize, compile raw data?**	Green crab, annually. Atlantic salmon bi-annually (or more frequently if requested by Contractor), zebra mussel annually. Ballast water bi-annually
22	**Report/publish data?**	Nahkeeta NW publishes an annual green crab report for Puget Sound. The ANS project prepares semi-annual reports for PSMFC on Atlantic Salmon efforts. Zebra mussel efforts are not published, although the spreadsheet is updated annually, and the information is shared with the 100th Meridian group and Portland State University.
23	**Analyzed/summarized data made available?**	The data is available upon request at any time. Formal reports vary with contractor requirements.
24	**What is URL?**	Data is not currently posted on the web site.
25	**Do other agencies collect data for this monitoring program? If so whom?**	The Department of Ecology's lake monitor sometimes collects zebra mussel veliger samples – as do PUD's and Tribes.
26	**Data readily available on maps?**	No. The project does not have GIS software for analysis and mapping, or adequate staffing to create the maps.
27	**Data exist as GIS coverage?**	GPS information is collected and put into the various databases.
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes, PSMFC provides fiscal support for the Atlantic Salmon surveys and uses the data to obtain fiscal support from NOAA for this and other ANS projects. They are also interested in the green crab, zebra mussel, and recreational boat inspection data. The data influences some of their funding decisions, as well as those of PSAT. Discoveries of new invasive species populations or increases in existing population densities may trigger a management response by the appropriate agency with authority.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	The Atlantic salmon monitoring program is rated as medium. The issue is of regional concern and similar programs are conducted in Alaska, B.C. and Washington. The potential impact of Atlantic salmon on native salmon is controversial, and efforts to evaluate the possibility of Atlantic salmon establishing reproducing populations should continue. Zebra mussels and recreational watercraft monitoring is rates high. Zebra mussels continue to spread westward towards Washington State Waters and recreational boaters are a major pathway for spread. The costs to protect and maintain infrastructure (dams, water supply uptakes, etc.) runs in the millions in infested areas and many Washington waters provide ideal conditions for zebra mussel populations to thrive. Early detection and rapid response is critical to preventing or reducing impact. European green crab monitoring is rated as high. In areas on the east coast where green crab populations have exploded, the impacts on shellfish, lobster, crab, and shrimp fisheries have been profound. The volunteer monitoring program in Puget Sound provides and early detection system that could allow for the implementation of a control program to reduce impact on other species managed by WDFW. The Aquatic Nuisance Species Committee and some members of the Northwest Straits Commission have recommended the expansion of the volunteer monitoring program to include other invasive species. The benefits of this would be

		an inclusive program covering multiple species, on-going data collection beyond green crab, and consistent geographic coverage that is not currently available. Ballast Water Monitoring is rated as mission critical. Ballast discharges can move invasive species to Washington waters from around the world. One highly invasive species (including disease organisms) could impact the entire food chain causing harm to a broad range of fish and wildlife species. Prevention is the most effective way to stop the impact of invasive species and monitoring ballast discharges is critical to managing this pathway.

Otolith Marking Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Otolith Marking Database**
3	**Contact**	Steve Schroder (360) 902-2751 schrosls@dfw.wa.gov
4	**Program described in CMS survey?**	No
5	**What department or division is it under?**	Fish Program
6	**Purpose of the monitoring program including monitoring questions being answered**	Evaluation of restoration and supplementation projects for salmonids, including listed chum salmon in the Hood Canal and Lower Columbia River ESUs. Our otolith marking programs are designed to answer questions on the effects of artificial cultural strategies (e.g. time and size at release, release location) and inadvertent domestication on salmonids. Specifically our studies determine growth, survival (from one life-history stage to another e.g. fry to smolt, smolt to adult), distribution (among and within rivers), age, size, and timing of maturation, abundance, and the biological characteristics of cultured salmonids. Strontium marking methods are being used to evaluate the success of habitat improvements in chum salmon spawning areas located in the Hood Canal and Lower Columbia River ESUs. Additionally transgenerational marks produced by injecting strontium into gravid rockfishes is being used to monitor the distribution patterns of rockfish juveniles in Puget Sound.
7	**Audience/customer/user**	Volunteer Groups, State and Local entities, Private foundations and firms, Tribal Nations, and Federal agencies
8	**Authority**	Internal. No specific statutory authority.
9	**Relates to watershed health and salmon recovery**	Directly supports. For example, recovery and supplementation of ESA listed chum salmon in the Hood Canal and Lower Columbia ESUs relies on thermal and strontium marks to discern the survival and distribution patterns of these listed fish.
10	**Date monitoring program began or ended?**	Thermal marks were first applied to salmonids in 1985 strontium marking began in 2000.
11	**Type of monitoring**	Project-specific, mainly survival, growth, & distributional
12	**Monitoring design**	Project-specific that depends on the questions that are being asked
13	**Primary geographic focus**	Puget Sound, Lower and Middle Columbia River
14	**Are monitoring sites geospatially referenced?**	No
15	**Does monitoring program provide data with known precision and certainty?**	Yes
16	**Salmon Recovery Region(s)**	Puget Sound, Coastal, Lower Columbia, Mid-Columbia
17	**Frequency of sample collection**	Project-specific, most are annual although in some cases two or more collection periods may occur
18	**What data are collected at sample sites**	Either otoliths or whole fish which are then brought into the lab for processing
19	**Monitoring Program biennial cost and fund sources**	$690K fed/local (not including database costs captured separately) Fund sources are generally outside contracts
20	**What is the name of the database(s) where these monitoring data reside?**	Otolith Marking Database—currently being constructed
21	**How often do you analyze, summarize, compile raw data?**	Once annually for each project or at the conclusion of contractual projects. For example, in 2005, we had 36 separate otolith marking projects. Data analyses and reports describing each project were produced and delivered to project sponsors
22	**Report/publish data?**	See above
23	**Analyzed/summarized data made available?**	Yes for projects supported by GFS, DJ and BPA federal dollars. Much of our work is contractual and we provide data to project sponsors. Access to that data would have to be through those entities
24	**What is URL?**	None
25	**Do other agencies collect data for this monitoring program? If so whom?**	No—we are the only extant thermal and strontium-marking lab in Washington State. However, the Tulalip Nation is developing an otolith laboratory to process otoliths from their fisheries.
26	**Data readily available on maps?**	No
27	**Data exist as GIS coverage?**	No

28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Yes, as mentioned above we perform work with multiple agencies who rely on our data to make decisions about hatchery supplementation (e.g. Seattle Public Utilities for the Landsburg sockeye hatchery), effectiveness of recovery programs for ESA listed populations (e.g. USFWS, NOAA-Fisheries—chum and steelhead recovery efforts), and effectiveness of hatchery programs designed to improve recreational and commercial fishing opportunities (e.g. BPA—Banks and Lake Roosevelt kokanee programs)
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High. This program provides WDFW with the capacity to identify the origin of salmonids produced in improved habitat areas (e.g. from Duncan Creek—Lower Columbia River; Big Beef Creek—Hood Canal), and from diverse hatchery rearing and release programs. The marks produced are permanent and can be identified at any stage in the life cycle and therefore are being considered as a potential tool to assist in the harvest management of salmonids along the entire Northeast Pacific coast. Finally, In some cases the only way to mark fish released at the fry stage is by using thermal or strontium marking techniques. With out these tools and the ability to discern these marks, proper evaluation of such programs would be problematic.

Washington Lakes and Rivers Information System (WLRIS) Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington Department of Fish & Wildlife**
2	**Database**	**Washington Lakes & Rivers Information System**
3	**Database acronym**	WLRIS
4	**Provide an overview of the data content in this database**	A statewide GIS layer of natural fish presence, spawning, and rearing reaches compiled onto the 1;24,000 resolution routed streams layer for Washington state. These data represent generalized fish presence and use type data for anadromous salmonids (including bull trout).
5	**Provide the name of the monitoring program(s) this database supports**	Multiple programs needing access to natural fish presence data
6	**Are there other databases that contain the same information? If so, which databases?**	Similar data exists in North West Indian Fisheries Commission Salmonid Steelhead Habitat Inventory & Assessment Project (NWIFC:SSHIAP). Data also integrated into the StreamNet database (PSMFC).
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes. Updates ongoing. Game fish species updates are a specific focus for 2006.
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	Ongoing
11	**Number of years database has been in operation?**	Five
12	**Does this database contain metadata describing content?**	Yes
13	**Where is this database located?**	WDFW Headquarters, Olympia Wash & also available for viewing and download online: http://wdfw.wa.gov/mapping/salmonscape/
14	**What is the basic architecture of the database**	Routed (dynamically segmented) hydrography layer with fish presence/use event tables managed in ESRI's INFO database.
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary? Why?**	No
17	**Raw data made available?**	No
18	**Data contact person**	Brian McTeague
19	**Does this database generate reports? If so, what kind of reports**	No. It is accessed by the PHS data release staff to generate reports.
20	**Analyzed/summarized data made available?**	Depending upon request
21	**Who uses this database?**	Public, private.
22	**Does Database generate maps?**	Yes
23	**Data exist as GIS coverage?**	Yes
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	52206 Fish GIS (3/4 of ITS 3 costs, prorated against total project costs to cover MH, DO help) $123K in WFS
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	A minor and variable amount (1/6?) of the funds originate from annual contracts with BPA; the rest are dedicated Fish Program funds.
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission Critical. Data is used by WDFW and provided to other state and federal agencies for use in defining regulatory actions including designation of critical habitats required by ESA.
27	**What enhancements should this database receive to increase its usefulness?**	Additional source information and expanded fine scale attributes

Otolith Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Washington State Department of Fish and Wildlife**
2	**Database**	**Otolith**
3	**Database acronym**	(none)
4	**Provide an overview of the data content in this database**	Thermal mark recoveries, readings for salmon and trout in WA, OR, ID, MT, CO
5	**Provide the name of the monitoring program(s) this database supports**	"Species Diversity" (Stock Identification)
6	**Are there other databases that contain the same information? If so, which databases?**	NPAFC contains thermal mark information for USA, Japan, Korea, Russia and Canada
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	No
10	**Frequency of data entry**	Daily
11	**Number of years database has been in operation?**	2+
12	**Does this database contain metadata describing content?**	No
13	**Where is this database located?**	Otolith Lab personal computer
14	**What is the basic architecture of the database**	Excel files; MS Access tables
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary? Why?**	No
17	**Raw data made available?**	No; readings are meaningless by themselves
18	**Data contact person**	Dong Nguyen or Jeff Grimm: WDFW
19	**Does this database generate reports? If so, what kind of reports**	Not yet
20	**Analyzed/summarized data made available?**	Yes
21	**Who uses this database?**	WDFW fisheries and hatchery managers, RFEGs, other WDFW regional staff
22	**Does Database generate maps?**	No
23	**Data exist as GIS coverage?**	No
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	Costs vary and are entirely covered by outside contracts. Estimate ¼ of F&W Bio 3 time = $34K Fed/local
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	Outside contract source
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission-critical, often providing time-sensitive fishery data and hatchery brood stock assessment
27	**What enhancements should this database receive to increase its usefulness?**	Migration to Access needs to be completed; report functionality needs to be added; query capabilities expanded; unique fish identifier needs to be pursued to facilitate linkage with other biological sampling or tagging datasets

Appendix 4. Washington Conservation Commission Monitoring Program and Database Survey Sheets

Limiting Factors Assessment Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Conservation Commission**
2	**Database**	**Salmon Habitat Limiting Factors Database**
3	**Database acronym**	LFA
4	**Provide an overview of the data content in this database**	Freshwater surface water quality, hydrology, instream habitat, land use, marine/estuarine water quality, predation of salmonids, riparian habitat, salmonid passage, salmonid productivity, waterway and channel modification
5	**Provide the name of the monitoring program(s) this database supports**	Limiting Factors Assessment. Is not a monitoring program, but an analysis tool that uses existing data.
6	**Are there other databases that contain the same information? If so, which databases?**	Yes, these reports were developed using existing data that were stored in everything from file folders to agency databases.
7	**Is this database specifically identified by statute? What statute?**	77RCW ESB 2496 Section 10 (1998)
8	**Is this database active?**	No
9	**Geospatially referenced?**	Partially. All salmonid distribution points and some habitat limiting factors information were GIS referenced.
10	**Frequency of data entry**	Program has ended.
11	**Number of years database has been in operation?**	Program spanned from 1998-2003.
12	**Does this database contain metadata describing content?**	Yes.
13	**Where is this database located?**	The reports reside at the Conservation Commission in Lacey, Wa and are available on the web. The GIS data are with SSHIAP at the NWIFC in Lacey.
14	**What is the basic architecture of the database**	Excel
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary?**	No
17	**Raw data made available?**	Email; web viewable, web downloadable
18	**Data contact person**	Carol Smith
19	**Does this database generate reports? If so, what kind of reports**	Yes, reports that prioritize salmonid habitat problems and locations.
20	**Analyzed/summarized data made available?**	Yes
21	**Who uses this database?**	All parties interested in salmon habitat restoration
22	**Does Database generate maps?**	Yes
23	**Data exist as GIS coverage?**	Yes
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	Program ended in 2003.
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	NA
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Program ended in 2003.

Limiting Factors Analysis

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Conservation Commission**
2	**Monitoring Program Name**	**Salmon Habitat Limiting Factors Analysis**
3	**Contact**	Carol Smith
4	**Program described in CMS survey?**	Yes
5	**What department or division is it under?**	
6	**Purpose of the monitoring program including monitoring questions being answered**	ID habitat problems that are preventing natural spawning salmon populations from reaching their full potential.
7	**Audience/customer/user**	All parties interested in Salmon Habitat Restoration.
8	**Authority**	Title 77 RCW; Engrossed Substitute House Bill 2496; Section 10 (1998)
9	**Relates to watershed health and salmon recovery**	Directly
10	**Date monitoring program began or ended?**	Began in 1998 and ended in 2003.
11	**Type of monitoring**	Assessment
12	**Monitoring design**	
13	**Primary geographic focus**	Statewide
14	**Are monitoring sites geospatially referenced?**	Partially. All salmon distribution data and some habitat factors are geospatially referenced.
15	**Does monitoring program provide data with known precision and certainty?**	No. Relied upon data already collected by other agencies and entities.
16	**Salmon Recovery Region(s)**	Lower Columbia; Middle Columbia; NE Washington; Puget Sound; Snake River; Upper Columbia; Washington Coast
17	**Frequency of sample collection**	NA
18	**What data are collected at sample sites?**	Freshwater Surface Water Quality; Hydrology; Instream Habitat; Land Use; Marine/Estuarine Water Quality; Predation Of Salmonids; Riparian Habitat; Salmonid Passage; Salmonid Productivity; Waterway and Channel Modification
19	**Monitoring Program biennial cost and fund sources**	Program no longer operating.
20	**What is the name of the database(s) where these monitoring data reside?**	Salmon Habitat Limiting Factors Reports at the Conservation Commission in Lacey, Wa. Available on web. GIS data through NWIFC in Lacey, WA.
21	**How often do you analyze, summarize, compile raw data?**	Project ended in 2003
22	**Report/publish data?**	Project ended in 2003.
23	**Analyzed/summarized data made available?**	Web Downloadable; Web Viewable
24	**What is URL?**	http://salmon.scc.wa.gov/
25	**Do other agencies collect data for this monitoring program? If so whom?**	Yes. Any state, federal, local, tribal, and private entities that collect salmon habitat data and allow data sharing.
26	**Data readily available on maps?**	Yes.
27	**Data exist as GIS coverage?**	Yes.
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Used by staff from a variety of agencies including tribes, WDFW, CDs, and DOE.
29	**How would you rank the importance of this monitoring program for conducting agency business?**	Not a monitoring program. Was an analysis report.

CREP Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Conservation Commission**
2	**Database**	**CREP (Conservation Reserve Enhancement Program) database**
3	**Database acronym**	CREP
4	**Provide an overview of the data content in this database**	Project information dealing with the CREP program (riparian habitat restoration).
5	**Provide the name of the monitoring program(s) this database supports**	Implementation Monitoring CREP program
6	**Are there other databases that contain the same information? If so, which databases?**	No
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	Twice a year
11	**Number of years database has been in operation?**	2
12	**Does this database contain metadata describing content?**	Yes
13	**Where is this database located?**	Whatcom Conservation District, Lynden, WA
14	**What is the basic architecture of the database**	Access
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary?**	Yes, some data fields contain private information
17	**Raw data made available?**	Yes, but not the information that would violate privacy concerns
18	**Data contact person**	Andrew Phay
19	**Does this database generate reports? If so, what kind of reports**	Not automatically
20	**Analyzed/summarized data made available?**	A CREP analysis is underway and will be available in 2006
21	**Who uses this database?**	Conservation Districts and the Conservation Commission
22	**Does Database generate maps?**	Yes
23	**Data exist as GIS coverage?**	Yes
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	Amount unknown. Source is General Fund-Program Management/Technical Assistance funds
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High. We are responsible for tracking CREP projects and reporting information regarding such projects at the state and federal level.

Watershed Data Pilot Project Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Conservation Commission**
2	**Database**	**Watershed Data Pilot Project**
3	**Database acronym**	Pilot
4	**Provide an overview of the data content in this database**	Pilot will explore a single repository to track, manage, and report at local, regional, and statewide basis all habitat projects developed by the conservation districts
5	**Provide the name of the monitoring program(s) this database supports**	Implementation and Effectiveness Monitoring via the Monitoring Forum.
6	**Are there other databases that contain the same information? If so, which databases?**	PRISM will contain the implementation monitoring information portion of projects when projects are SRFB funded. It is likely that many projects in this database will not be SRFB funded.
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Pilot
9	**Geospatially referenced?**	Yes
10	**Frequency of data entry**	Not yet determined. Pilot project.
11	**Number of years database has been in operation?**	Being constructed
12	**Does this database contain metadata describing content?**	It will.
13	**Where is this database located?**	Not yet determined. Conservation Commission is lead agency for project.
14	**What is the basic architecture of the database**	Not yet determined.
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary?**	Not yet determined.
17	**Raw data made available?**	Not yet determined
18	**Data contact person**	Glenn Briskin 360-561-0897
19	**Does this database generate reports? If so, what kind of reports**	Not yet determined
20	**Analyzed/summarized data made available?**	Not yet determined
21	**Who uses this database?**	Not yet determined
22	**Does Database generate maps?**	It is anticipated that GIS maps will be produced.
23	**Data exist as GIS coverage?**	This is one of the objectives for the project.
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	Not yet determined. Pilot cost is $500K
25	**Are these funds dedicated or short term project funding? If short term, when will funding terminate?**	NA
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High. It will allow us to communicated the full extent of Conservation District efforts, and will aid with the objectives of implementation and effectiveness monitoring as per the Monitoring Forum.

Appendix 5. Interagency Committee for Outdoor Recreation Monitoring Program and Database Survey Sheets

SRFB IMW Monitoring

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Interagency Committee for Outdoor Recreation/Salmon Recovery Funding Board**
2	**Monitoring Program Name**	**SRFB Intensively Monitoring Watersheds (IMW)**
3	**Contact**	Bruce Crawford 360-902-2956
4	**Program described in CMS survey?**	Yes. As a recommendation for future monitoring needs
5	**What department or division is it under?**	MMT Division of IAC
6	**Purpose of the monitoring program including monitoring questions being answered**	Are restoration projects within a watershed as a whole causing an increase in juvenile migrant coho salmon, chinook salmon and steelhead? The SRFB funds hundreds of projects for restoring and acquiring salmon habitat. The purpose of the monitoring program is to determine if the projects were effective in actually producing more salmon in the stream. SRFB is looking at three clusters of small watersheds where projects can be placed and the results measured. It is also measuring changes in production of chinook salmon in the lower Skagit River estuary.
7	**Audience/customer/user**	US Congress, Office of Management and Budget, Joint Legislative Audit Review Committee, Salmon Recovery Funding Board, Pacific Northwest Aquatic Monitoring Partnership, Governor's Salmon Recovery Office, public
8	**Authority**	Recommended by the Comprehensive Monitoring Strategy and the Independent Science Panel
9	**Relates to watershed health and salmon recovery**	Directly
10	**Date monitoring program began or ended?**	July 2004
11	**Type of monitoring**	Watershed scale Effectiveness Monitoring
12	**Monitoring design**	Before and After Control Impact analysis of variance using a paired t-test approach to paired watersheds
13	**Primary geographic focus**	Selected representative watersheds
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes estimated certainty level is 90%
16	**Salmon Recovery Region(s)**	Lower Columbia and Puget Sound
17	**Frequency of sample collection**	Annual
18	**What data are collected at sample sites?**	Riparian vegetation, shading, percent fines, water quality, Thalweg mean residual volume, mean pool area, percent eroding banks, macroinvertebrates, salmonid abundance, large wood, bank full width and depth, upland vegetation, beach gradient, invasive species, and more.
19	**Monitoring Program biennial cost and fund sources**	$2,180,000 State capital dollars
20	**What is the name of the database(s) where these monitoring data reside?**	Raw data are found in Access databases tended by Department of Ecology
21	**How often do you analyze, summarize, compile raw data?**	Annually
22	**Report/publish data?**	Annual written progress report and oral report to the SRFB.
23	**Analyzed/summarized data made available?**	Yes
24	**What is URL?**	http://wdfw.wa.gov/fish/wild_salmon_monitor/imw.htm
25	**Do other agencies collect data for this monitoring program? If so whom?**	Yes data collection performed using contracted services of Department of Ecology
26	**Data readily available on maps?**	No
27	**Data exist as GIS coverage?**	No
28	**Do other agencies rely upon data from this program for decision making? What decisions?**	Other agencies may rely upon this data to confirm that their restoration action are an effective method of restoring salmon.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High. This monitoring answers major questions being asked by the Legislature and Congress. Are restoration actions making a difference in creating more habitat and more fish? Without the answers to those questions, money may be wasted and future funding may be in jeopardy.

SRFB Project Effectiveness Monitoring

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Interagency Committee for Outdoor Recreation/Salmon Recovery Funding Board**
2	**Monitoring Program Name**	**SRFB Project Effectiveness Monitoring**
3	**Contact**	Bruce Crawford 360-902-2956
4	**Program described in CMS survey?**	Yes. As a recommendation for future monitoring needs
5	**What department or division is it under?**	MMT Division of IAC
6	**Purpose of the monitoring program including monitoring questions being answered**	What categories of restoration projects are most effective? What are the costs versus benefits for each category of project? What is the expected life of the projects implemented? The SRFB funds hundreds of projects for restoring and acquiring salmon habitat. The purpose of the monitoring program is to determine if the projects were effective. Did the trees planted actually survive and grow to shade the stream? Did the stream channel improvement actually show that more fish used the area? Did the replaced culvert actually allow more fish to move upstream to spawn and live? SRFB is looking at nine categories of projects for a total of approximately 90 locations randomly selected across the state.
7	**Audience/customer/user**	US Congress, Office of Management and Budget, Joint Legislative Audit Review Committee, Salmon Recovery Funding Board, Pacific Northwest Aquatic Monitoring Partnership, Governor's Salmon Recovery Office, public
8	**Authority**	Recommended by the Comprehensive Monitoring Strategy and the Independent Science Panel
9	**Relates to watershed health and salmon recovery**	Directly
10	**Date monitoring program began or ended?**	May 2004
11	**Type of monitoring**	Project scale Effectiveness Monitoring
12	**Monitoring design**	Before and After Control Impact analysis of variance using a paired t test approach
13	**Primary geographic focus**	Statewide
14	**Are monitoring sites geospatially referenced?**	Yes
15	**Does monitoring program provide data with known precision and certainty?**	Yes estimated certainty level is 90%
16	**Salmon Recovery Region(s)**	Lower Columbia; Middle Columbia; NE Washington; Puget Sound; Snake River; Upper Columbia; Washington Coast
17	**Frequency of sample collection**	Annual
18	**What data are collected at sample sites?**	Riparian vegetation, shading, percent fines, Thalweg mean residual volume, mean pool area, percent eroding banks, macroinvertebrates, salmonid abundance, large wood, bankfull width and depth, upland vegetation, beach gradient, invasive species, and more.
19	**Monitoring Program biennial cost and fund sources**	$900,000 State capital dollars
20	**What is the name of the database(s) where these monitoring data reside?**	Summarized data are in PRISM. Raw data are found in Access databases tended by Tetratech EC Inc.
21	**How often do you analyze, summarize, compile raw data?**	Annually submitted to PRISM
22	**Report/publish data?**	Annual written progress report and oral report to the SRFB.
23	**Analyzed/summarized data made available?**	Viewable over PRISM with permission
24	**What is URL?**	www.iac.wa.gov
25	**Do other agencies collect data for this monitoring program? If so whom?**	No data collection performed using contracted services of Tetra Tech E.C. Inc
26	**Data readily available on maps?**	yes
27	**Data exist as GIS coverage?**	No
28	**Do other agencies rely upon data**	Other agencies may rely upon this data to decide which types of

	from this program for decision making? What decisions?	restoration actions are the most effective, long lasting, and cost effective.
29	**How would you rank the importance of this monitoring program for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	High. This monitoring answers major questions being asked by the Legislature and Congress. Are restoration actions making a difference in creating more habitat and more fish? Without the answers to those questions, money may be wasted and future funding may be in jeopardy.

PRISM Database

	SURVEY QUESTIONS	SURVEY ANSWERS
1	**Organization**	**Interagency Committee for Outdoor Recreation (IAC)/Salmon Recovery Funding Board (SRFB)**
2	**Database**	**Project Information System**
3	**Database acronym**	PRISM
4	**Provide an overview of the data content in this database**	Grant project information for ALEA, WWRP, SRFB, LWCF, NRTP, NOVA, BIG, and other fund sources, project proposals, location, costs, project implementation metrics, contract contents and updates, milestones, photos, GIS mapping, monitoring data for habitat effectiveness; federal reporting on ESA progress. Grant applicants can apply for and update their grant information over the Internet.
5	**Provide the name of the monitoring program(s) this database supports**	Grant management implementation and compliance; SRFB Project Scale Effectiveness Monitoring
6	**Are there other databases that contain the same information? If so, which databases?**	No other database contains the grant information for the identified fund sources. Similar habitat information is located at Ecology and at WDFW but for different investigations and locations
7	**Is this database specifically identified by statute? What statute?**	No
8	**Is this database active?**	Yes
9	**Geospatially referenced?**	Yes. GIS capability being enhanced at this time to be able to show polygons
10	**Frequency of data entry**	Continuous as grant applicants apply and upgrade their information and as grant managers at IAC review and inspect projects.
11	**Number of years database has been in operation?**	Database created in 1995 Ten year in operation
12	**Does this database contain metadata describing content?**	Yes
13	**Where is this database located?**	Natural Resources Building main server room
14	**What is the basic architecture of the database**	Visual Basic 6. Being upgraded to .NET architecture at this time to improve client service over the Internet and to maintain software support. SQL Server 2000 being upgraded to SQL Server 2005.
15	**Charge money for the data?**	No
16	**Data sensitive or proprietary?**	Some data is protected such as personal information like tax ID numbers home addresses and telephone numbers.
17	**Raw data made available?**	Email; web viewable, web downloadable
18	**Data contact person**	Scott Chapman 360-902-3017 scottc@iac.wa.gov
19	**Does this database generate reports? If so, what kind of reports**	Yes Generates over 300 preprogrammed reports about projects, costs, locations, etc.
20	**Analyzed/summarized data made available?**	Effectiveness monitoring information is summarized field data taken from Access databases maintained by contractors.
21	**Who uses this database?**	(1) IAC staff for project management, contract management and fiscal activities. (2) Project applicants for parks, trails, boating, ORV, horse trails shooting ranges, habitat restoration projects, habitat acquisition projects, habitat assessments, and others. (3) Legislative staff, public and other government entities wishing to track outdoor recreation and habitat projects. (4) National Marine Fisheries Service uses these data to report to Congress on progress made by Washington in salmon recovery. (5) Database acts as repository for habitat project information for Puget Sound Nearshore Program.
22	**Does Database generate maps?**	Yes
23	**Data exist as GIS coverage?**	Yes
24	**What is the biennial cost to operate and maintain this database? What are the fund sources?**	$500K Fund source is General Fund State. Upgrades and improvements have been generally funded from Boating Fund and Pacific Coastal Salmon Recovery funds
25	**Are these funds dedicated or short term project**	Dedicated

	funding? If short term, when will funding terminate?	
26	**How would you rank the importance of this database for conducting agency business? (redundant, not necessary, low, medium, high, mission critical) Why?**	Mission Critical. The IAC office administers hundreds of grant applications per year and tracks thousands of older grants for compliance. Current staff of grant managers can only keep up with the workload as a result of PRISM. PRISM is critical to proper accountability for state and federal investments in habitat and outdoor recreation facilities and lands