



StreamNet Fiscal Year 2010 Annual Report

Period covered:
October 1, 2009 through September 30, 2010

StreamNet Project

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and

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Executive Summary

Fiscal year 2010 represented a change in focus for the StreamNet Project, including both segments of the project under Pacific States Marine Fisheries Commission (PSMFC) and Columbia River Inter-Tribal Fish Commission (CRITFC). In addition to the routine updating of the previously existing data types, providing data to the CBFWA Status of the Resource (SOTR) report, computer and website maintenance, and operation of the StreamNet Library, the project began shifting emphasis to regional scale reporting. Significant effort was directed to assisting regional efforts led by CBFWA, PNAMP and BPA in locating and organizing data to support reporting of high-level Indicators to track progress of populations toward recovery and responses to actions under the Columbia Basin Biological Opinion (BiOp). Project representatives at both the Regional level in PSMFC and the other project participants worked to support planning of the Coordinated Assessments being led by CBFWA and PNAMP, development of the initial draft Data Exchange Template (DET) for three pilot Indicators that support VSP, and conduct of an initial test of the draft DET for three populations of listed anadromous salmonids.

As in FY 2009, the StreamNet project operated as a single project but under funding through two contracts with BPA, one with PSMFC and the other with CRITFC under the Columbia Basin Fish Accords. The contract with PSMFC included subcontracts with the other project participants: Oregon Department of Fish and Wildlife (ODFW), Washington Department of Fish and Wildlife (WDFW), Idaho Department of Fish and Game (IDFG), Montana Fish, Wildlife and Parks (MFWP), and the U.S. Fish and Wildlife Service (FWS). PSMFC was responsible for overall project coordination and management, maintenance of the project computer systems and websites, and data delivery through the online interactive maps and database query system. CRITFC was responsible for maintenance and operation of the StreamNet Library and some data delivery. Subcontracting partners were responsible for acquisition, standardization and submission of data to the StreamNet database at PSMFC and overall project guidance through participation in the StreamNet Steering Committee.

StreamNet continued to emphasize development of internal database systems within its partner agencies as outlined in its strategic vision ([StreamNet Strategic Plan](#)). The value of this became even more evident this year, as the technological capability needed to automate data flow from the field to the agency and then to StreamNet is the same technology needed to automate data sharing from the agencies to regional scale reporting under the Coordinated Assessments.

The StreamNet website was enhanced by the addition of an online upload procedure that facilitates submission of data sets to the StreamNet Data Store, replacing the previous process which required installation of a small application on the computer sending the data and explanatory information. The online approach successfully eliminated problems associated with local protections that sometimes prevented installation of un-approved software. The online application automatically downloads and inserts project information from the BPA Taurus system for any data set that originates from a BPA project. The Data Store is an online archive capable of storing and retrieving data sets that do not fit the standardized StreamNet Data Exchange Format.

The online data query system was scheduled for revision this year to make it simpler to use and to add features such as the ability to select multiple entries within a single criterion (such as data from several streams in a single query). A new approach has been selected that moves the selection process within the database, significantly increasing speed. Significant progress was made but the new approach has not yet been completed and will not

be functional until FY 2011. The power of the current query system became evident as we attempted simplification, since any simplification reduced current capabilities. As a result, the revised query system may need to offer several different approaches so that data users can select an approach that is tailored to their specific query approach.

Routine updates of the standard data sets in StreamNet continued this year. WDFW was fortuitous in being able to locate some staff time to allow capture of data from eastern Washington despite lack of funding in the contract for a position to do that work this year, although that will not necessarily be true for next fiscal year. ODFW focused its priority for data acquisition on data needed for the SOTR report, and it also is faced with insufficient funding under the contract for staff to update all data trends each year. IDFG submitted data using automated data delivery from the Idaho Fish and Wildlife Information System. MFWP delivered all resident fish species data, since no anadromous fish make it to Montana. FWS continued to provide hatchery related data from the national fish hatcheries in the region.

Significant effort was expended in refining the scale of the hydrography used to georeference StreamNet data to the stream network. In the absence of a regionally adopted and finalized National Hydrography Dataset (NHD) hydrography, StreamNet implemented a finer scale 'Mixed Scale Hydrography' (MSH) that includes all streams at the 1:100,000 scale plus all finer resolution streams for which StreamNet has fish data. This is viewed as an intermediate step with the ultimate goal of switching to the NHD when that hydrography is stable and we have the capability of instituting 'whole stream identifier' routs to it. Most of the StreamNet data were converted over to the MSH as the new standard for the project.

The StreamNet Project coordinated with a number of entities to facilitate improved data management, with particular support provided to the Coordinated Assessments. In addition, project staff members participated actively in the Pacific Northwest Aquatic Monitoring Partnership (PNAMP) in various capacities, including on the PNAMP Steering Committee, the Data Management Leadership Team, the Metadata Work Group and the Effectiveness Monitoring Work Group. Using non-project funding, project staff members participated in several projects that will ultimately improve the flow of data to StreamNet, including a coastal cutthroat trout assessment project and smolt trapping in the Central Valley of California.

StreamNet remains committed to providing standardized and georeferenced fish data from the management agencies to support regional scale programs. Ongoing goals include utilizing data automation to speed data conversion to regional standards and updating ongoing data trends, expanding data capture and standardization to include additional data types needed for regional scale monitoring and BiOp reporting, and improving data access capabilities. Emphasis has increased on regional scale reporting, and we anticipate that this effort will grow in importance going forward.

Introduction

This report describes work accomplished by the StreamNet Project, BPA Project Numbers 1988-108-04 and 2008-505-00, during Fiscal Year 2010 (FY-10) from October 1, 2009 through September 30, 2010. Details about the work done to accomplish the year's Milestones are summarized and reported at the Work Element level. WE Titles and Milestones are described in the 2010 Work Statement which is available through Pisces, the BPA project management system and in the [StreamNet Documents](#) page of the project website, www.streamnet.org.

StreamNet is a cooperative, multi-agency data compilation and data management project authorized by the Northwest Power and Conservation Council's (NPCC) Fish and Wildlife Program (FWP), funded primarily by the Bonneville Power Administration (BPA) through two contracts, one with Pacific States Marine Fisheries Commission (PSMFC) and the Columbia River Inter-Tribal Fish Commission (CRITFC). This report consolidates project activities under both contracts. The project is administered by the PSMFC. The PSMFC contract includes subcontracts for Idaho Fish and Game (IDFG), Montana Game, Fish and Parks (MFGP), Oregon Department of Fish and Wildlife (ODFW), Washington Department of Fish and Wildlife (WDFW) and the U.S. Fish and Wildlife Service (FWS) which constitute the majority of the project. These agencies acquire, georeference and standardize fish related data; develop databases within the respective agencies; and submit data to the StreamNet database at PSMFC. CRITFC is responsible for some data development and submission and is also responsible for operating and maintaining the StreamNet Library, which maintains a library of data references and fish and wildlife related reports and publications as well as performing as a full service library. PSMFC performs overall project management, maintains and manages the regional database, disseminates regionally standardized data, and provides regional data services. Information about the project, fish related data, past reports and other documents are available at the project website at www.streamnet.org.

Work priorities for FY-10 were organized under six Work Elements: Data development (WE 159), Database Management (WE 160), Data Dissemination (WE 161), Regional Coordination (WE 189), Manage and Administer Projects (WE 119), Annual Report (WE 132), and Produce Pisces Status Report (WE 185). The CRITFC 2010 Statement of Work was very similar, with the only difference being use of WE 99 used to cover the StreamNet Library's public involvement efforts rather than considering those as data dissemination under WE 161 as in the rest of the project. Those activities are presented under WE 161 in this report in order to keep similar efforts grouped together.

Activities for FY-2010 are presented below, summarized at the Work Element level. More detailed activities for each Work Element Title are presented in Appendix A. Work that was done related to StreamNet goals but outside of the formal Statement of Work or on other funding sources is presented in Appendix B.

Project Accomplishments by Work Element

Work Element 159: Data Development

Data development work includes the acquisition of data from the data source agencies, standardization of the data to fit the common regional standard of the StreamNet Data Exchange Format (DEF), addition of georeferencing to the data, QA/AC at the agency level, and exchange of the data to the StreamNet database at PSMFC. The majority of this work is done by the agency partners in the project. A new capability of the project is the ability of data compilers in the partner agencies to test load the data into an external copy of the StreamNet database to assure that the data are fully compatible with the DEF and will load smoothly when submitted to PSMFC.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element

CRITFC Through better coordination between several external projects, we were able to fund a 4-person database management group to provide consistent data management and data application development. All legacy data were converted from Access to SQL formats. SQL data entry routines were developed for Bonneville Dam sampling data (species, length, age, tags, genetics), catch sampling data, and habitat data in the Grande Ronde watershed.

Data pen technology was tested in two prototype applications, one internal and one external to CRITFC. While results were mixed, they were not surprising for a completely new technology. Technological problems involved integrating the pen technology with existing devices and databases. Proper advance training of field personnel is also necessary to reduce unanticipated problems and improve data quality. Overall this year's prototype testing was encouraging, and additional deployment of this technology is anticipated.

FWS FWS acquired data from the national fish hatcheries and submitted them to the StreamNet database in the DEF format.

IDFG Up-to-date redd count and hatchery return data were obtained and submitted to PSMFC and are available on the StreamNet Web site. These submissions occurred earlier in the year than in past years because of our use of our spawning ground survey and hatchery databases. All anadromous fish hatcheries in Idaho are now using one hatchery database, but we still had to go out and obtain redd count data from some other agencies. That should decrease in future years, as IDFG, Nez Perce Tribe and Shoshone-Bannock Tribes are now using the same spawning ground survey database. Post-run derived age data were located and we received permission to submit them to StreamNet. Other data categories were updated including hatchery facilities and barriers. The 2009 Westslope Cutthroat Trout Range-wide Assessment database, GIS layers, report, and protocol were uploaded to the StreamNet Data-Store.

MFWP Visits were made or data were received from each regional/field office with additional data collected over the year to complete the annual update. Over 1,200 fisheries distribution records were created or edited, over 9823 fish survey records and 1,410 new survey locations were added, 120 barriers were edited or updated and nearly 200 genetic analysis results were added or updated. Many of these updates occurred due to refinements and data review for the Crucial Areas Planning System. 87 restoration projects were added or updated and work on an agency wide restoration database was initiated. Nearly 500 library entries were entered or updated during the year and the data and electronic references were exchanged with Regional StreamNet. All data types in the SOW were exchanged to the StreamNet database with some sent as independent datasets for the Data Store.

MFWP assisted the Idaho Fish and Game with the regional Westslope Cutthroat Assessment by providing technical support and facilitating Montana meetings. Meetings were attended and data was transferred to StreamNet staff at PSMFC for inclusion into the central database from the Yellowstone Cutthroat Trout Assessment. Coordination continued on the centralized Intercontinental Cutthroat Trout Protocol proposal with StreamNet staff attending a meeting in Utah with all the stakeholders.

Coordination between MFWP and MT NRIS on Montana's hydrography including staff participation in a NHD conference call regarding harmonization of Canadian hydrography and the NHD and several calls and meetings regarding LLID events on NHD routes. Unfortunately, progress on the pilot project to integrate NHD and LIID was not as significant as hoped due to the shift in NRIS workload of the NHD as a priority.

ODFW ODFW StreamNet met all of its data delivery requirements during the fiscal year. Data delivered or made available to StreamNet included anadromous and resident fish distribution, barriers, freshwater/estuary harvest information, juvenile abundance, dam facility, hatchery facility, hatchery return data, and 1,154 new, updated and/or corrected abundance trends. New age data were not made available by ODFW during this fiscal year and therefore were not exchanged. Effort to update trends was reduced this year in favor of other priority tasks related to supporting Coordinated Assessments in WE-189. Two hundred and one reference documents were submitted to the StreamNet Library related to these data submissions. The year's work brings the total number of Oregon abundance trends to 9,191 spanning the years 1938 through 2010. Routine QA/QC efforts were conducted throughout the year. Monitoring, evaluating and responding to 100k LLID/ 24k Framework / NHD hydro needs continued to take a great deal of time this year.

Region	Regional efforts toward data development included addition of seven non-standardized data sets into the Data Store and submission of documents to the StreamNet Library as they became available. Additional emphasis was placed on utilization of the Data Store as a place to share data sets that don't fit in the standard formats of other data warehouses, particularly for entities that do not have the capability of hosting or managing online archives.
WDFW	WDFW concentrated heavily this year in the development and refinement of internal systems to meet anticipated emerging regional reporting needs. Our intent is to modernize internal data storage systems and automate, where possible, field to HQ data transfer through the use of data loggers, automated web funnels and web services in a project we are calling the Salmon Conservation Reporting Engine (SCoRE). External reporting drivers for this effort include, but are not limited to: the Columbia River Coordinated Assessments, Puget Sound Partnership's Provisional Indicators, Washington Governor's Salmon Recovery Office publication "The State of the Salmon" (SoS), HSRG based hatchery reporting recommendations, and StreamNet.

Work Element 160: Database Management

Database management entailed the routine maintenance and upgrades to the hardware and software that are used to manage the StreamNet data and to map and disseminate them via the various components of the StreamNet website, www.streamnet.org. All data systems at the PSMFC and participating agency levels were fully maintained this year, and upgraded as necessary. PSMFC instituted a new external copy of the main StreamNet database so that data compilers in the agencies can access the database directly to determine whether the data are fully compliant and will load smoothly prior to exchange with PSMFC. Long range goals for this approach include the ability for compilers to load the data directly into the StreamNet database.

Upgrades to the database systems included development of an on-line application to support direct upload of independent data sets (those that do not comply with the StreamNet DEF) along with the information that describes the data set to the online Data Store archive. A key feature of this application is that for data sets from BPA funded projects, the application automatically accesses the BPA Taurus website and inserts all project information automatically in the metadata for the data set.

Another upgrade that was initiated this year was a complete redesign of the primary tabular data query system. The intent is to improve speed, simplify the query process, and allow selection of more than one element within a selection criterion. We have selected a means of moving the query sorting process to within the database, which significantly improves speed. Allowing the selection of multiple criteria at one time adds to the complexity of the query process, however, and to a degree conflicts with the intent of making the query system more simple to use. This effort is still underway and will be continued in FY-2011.

Details of database management efforts of all project participants are described below:

Project Accomplishments During Fiscal Year 2010, summarized by Work Element

CRITFC	Routine database management, including data loading and QA/QC and system maintenance and update, continued throughout the fiscal year. The data team is building regional database 'best practices' and recommendations into the new data entry and management procedures and applications. Regional agreements on the coding of spatial and temporal data were built in to the converted databases and best management practices are being used as new applications are developed. The principle improvements this year were a reduction in the number of data handling steps, thus speeding capture into databases, reducing the opportunities for error, and speeding final QA/QC review of data.
FWS	StreamNet related software was also updated throughout the year. These upgrades included new hardware in the forms of a new PC and a new server at the Columbia River Project Office.
IDFG	Standard computer system administration was provided by IDFG. We implemented a new production and development server environment, including the use of virtual servers. A new version of the Spawning Ground Survey database and data entry application was completed and deployed. It is currently being used by IDFG, Nez Perce Tribe and Shoshone-Bannock Tribes to enter their 2010 spawning ground survey data. Using non-StreamNet funds, an updated version of the IDFG stream survey data entry application was deployed. User manuals for each of these databases were updated. Generalized fish distribution records for Westslope cutthroat trout were reconciled at state boundaries and reference information for white sturgeon was corrected. Trend identifiers for 33 Chinook and steelhead trends were updated. We conducted extensive in-season QA/QC of hatchery return and spawning data being compiled on a daily basis and continued to QA/QC the historic data in both the spawning ground survey and hatchery databases.
MFWP	Data Services staff continued to assist FWP IT staff in the deployment of ArcGIS Server on the FWP IT infrastructure throughout the year without complete success; work will continue in the 1st quarter of FY11. Office 2007 was installed on staff computers and some also were upgraded to Windows 7. Throughout the year, a significant amount of staff time has been spent participating in the scoping and initial development of the fisheries portion of the agency's Centralized Survey and Inventory

database. Alternative data entry tools have been researched and evaluated; common minimum fields have been discussed and development of new field forms to facilitate standardized data collection has occurred. Meetings between MFWP StreamNet staff and FWP Application Development and Fisheries Bureau staff were held to discuss the centralized database and to develop some preliminary data table structure and design. Field data entry tools were researched and evaluated by a group which includes a StreamNet staff member. Staff attended a Fish Managers Meeting where the lake survey system from North Dakota was demonstrated. Field data entry tools continue to be evaluated.

- ODFW ODFW StreamNet performed routine database maintenance and management throughout the year. Computer systems were upgraded and repaired as necessary, including migrating our development and production environments from SQL Server 2000 to 2005. All applicable QA/QC routines on accumulated data sets were carried out. This year we successfully migrated to a virtual server environment. Application maintenance and development occurred throughout the year, including migrating several applications from .NET Framework 1.1 to 3.5. Modifications were made to Oregon's Trend database to more efficiently address SOTR data needs and edits prescribed by mixed scale hydro changes, taking a significant amount of time this year. We continued development and management of geodatabases and standardized metadata to manage GIS data. And, we participated in DEF discussions and spent time reviewing the draft 2010.1 DEF upon its release. The need for a juvenile abundance DEF continues.
- Region The regional StreamNet office at PSMFC maintained and updated as needed all database systems that support the StreamNet project, including the database server, the GIS servers and the web server. We continued a move toward utilization of virtual servers, and all GIS operations are now conducted in the virtual environment. All software was maintained and upgraded as needed. All data sets were quality assessed and updated as data were received from the contributing agencies. A significant addition this fiscal year was deployment of an external copy of the StreamNet database that allows data compilers in the agencies to validate their data against the StreamNet database format prior to data submission, improving data submission efficiency. The upload procedure for submission of data sets to the Data Store was redeveloped as a web application, and we began designing a new approach to querying the StreamNet database online that will be faster and allow selection of multiple criteria within a category. The query system redesign will continue into FY-11. Significant effort was also expended in developing a 'mixed scale' hydrography (MSH) and transferring data to this finer scale layer. This MSH is intended to provide a higher resolution for depicting StreamNet data until the National Hydrography Data Set is fully completed and implemented.
- WDFW During FY2010, The Washington StreamNet staff began upgrading internal databases from Access to SQL Server in anticipation of future integration with our Agency's Salmon Conservation Reporting Engine database (SCoRE). All systems were backed up and regularly scheduled maintenance was performed.

Work Element 161: Data Dissemination

Data dissemination includes all processes related to providing data and other information to data users. The primary means of data dissemination was the StreamNet website, www.streamnet.org, which includes the tabular data query system, interactive map applications to view and obtain data, the Data Store online archive to save and to locate data sets, and the StreamNet Library which houses data source documents for the data in StreamNet and also provides a full suite of library services.

In FY-2009 we instituted a new tracking system for usage of the StreamNet website which proved much more accurate and reliable. In FY-2010 website use generally increased (Table 1). Usage statistics are broken out in three components which are non-redundant: the website primary html pages, the online data query system, and the map query system. The top users of the various components of the website are presented in Tables 2, 3 and 4.

Table 1. Annual use of the StreamNet website, broken out by general website pages, the tabular data query system and the interactive online map applications. These are reported separately and are not redundant.

	<u>Website</u>		<u>Query System</u>		<u>Mappers</u>	
	<u>2010</u>	<u>2009</u>	<u>2010</u>	<u>2009</u>	<u>2010</u>	<u>2009</u>
Use Statistics						
Total Visits	23,029	11,578	5,786	2,639	7,218	5,267
Unique Visitors	13,924	6,983	2,906	1,296	3,620	2,755
Page views	49,725	26,261	81,472	44,108	29,170	19,555

Table 2. Top users of the StreamNet general website pages (number of visits).

<u>Top Users (visits)</u>	<u>2010</u>	<u>2,009</u>
Internet service providers (Comcast, Verizon, etc.)	8,369	2,530
State of Oregon	974	594
U.S.D.A. Forest Service	593	339
National Oceanic and Atmospheric Administration	572	306
Washington State Department of Fish and Wildlife	584	261
Headquarters USAISC	515	277
Bonneville Power Administration	296	150
U.S. Fish and Wildlife Service, IRM/BFO Hq	262	185
USDA Office of Operations	244	201
University of Washington	169	70
State of Idaho	166	128
University of Washington	169	70
U.S. DOI Bureau of Land Management	155	95
Oregon State University	148	64
University of Oregon	134	8
State of Montana	102	45
Sitka Technology Group, LLCc	98	0
University of Nebraska-Lincoln	93	19
Washington School Information Processing Cooperative	89	65
U.S. Geological Survey	74	25
National Wetlands Research Center, USGS	70	38
HDR	58	61
Portland Community College	55	60
Portland State University	55	39
Environmental Science Associates	12	36
Outsource Technologies, Inc.	0	80

Table 3. Top users of the StreamNet online tabular data query system (number of visits).

<u>Top users (No. of visits)</u>	<u>2010</u>	<u>2009</u>
Internet service providers (Comcast, Verizon, etc.)	2,461	883
State of Oregon	732	307
Outsource Technologies, Inc.	380	0
National Oceanic and Atmospheric Administration	242	134
USDA Forest Service	196	76
Headquarters USAISC	115	769
Bonneville Power Administration	97	44
USDA Office of Operations	87	60
University of California Santa Barbara	85	11
U.S Fish and Wildlife Service IRM/BFO Hq	83	43
Oregon State University	65	14
Washington State Department of Fish and Wildlife	60	23
US DOI Bureau of Land Management	59	37
State of Idaho	50	52
University of Nebraska-Lincoln	32	9
University of Oregon	32	0
Oregon State System of Higher Education	26	8
Nez Perce Tribe	25	4
Teale Data Center	24	10
U.S. Geological Survey	23	2
University of Washington	17	30
Environmental Science Associates	10	15
Landau Associates	11	14
HDR	5	12
Portland Community College	7	12
State of Utah	3	12
Washington State Department of Natural Resources	5	12
Terra Science, Inc	0	10

Table 4. Top users of the StreamNet interactive map applications (number of visits).

<u>Top users of the StreamNet map applications</u>	<u>2010</u>	<u>2009</u>
Internet service providers (Comcast, Verizon, etc.)	1,875	1,352
Headquarters USAISC	497	371
State of Oregon	453	344
USDA Forest Service	439	282
National Oceanic and Atmospheric Administration	286	204
Bonneville Power Administration	270	137
USFA Office of Operations	206	204
U.S. Fish and Wildlife Service IRM/BFO Hq	140	132
US DOI Bureau of Land Management	90	68
University of Oregon	68	8
HDR	54	52
FEMA	51	21
Parametrix	49	26
State of Idaho	47	33
University of Washington	45	26
U.S. Environmental Protection Agency	42	23
Pierce County	37	10
Vigil-Agrimis, Inc	37	0
Washington State Department of Fish and Wildlife	72	37
Oregon State University	36	27
King County Gov	29	51
State of Washington, Department of Ecology	0	40
Environmental Science Associates	5	36
W H Pacific	21	36
Portland Community College	11	32
Landau Associates	29	29
State of Washington, Department of Transportation	0	26

In addition to data dissemination online, most project participants also respond directly to requests for data or assistance in locating data (Tables 5, 6 and 7). PSMFC StreamNet follows a policy of responding to all data and assistance requests within one business day, although occasionally complex data requests may take several days to fill. Several participating agencies reported that the volume of direct data requests has been increasing significantly to the degree that it is taking time away from work formally required under the Statement of Work. On the other hand, PSMFC StreamNet has seen a decrease in direct data requests following the website redesign that went into effect in FY-2009.

Table 5. Information requests served in FY 2010, by StreamNet partner and by type of organization making the request.

<u>Request from</u>	<u>CRITFC</u>	<u>IDFG</u>	<u>MFWP</u>	<u>ODFW</u>	<u>WDFW</u>	<u>PSMFC</u>
College/university	543	3	0	08	0	3
Government, federal	555	15	4	22	6	16
Government, state	420	56	20	307	27	2
Government, tribal / Tribal organization	1,818	5	0	2	2	3
Government, county/local	11	0	0	4	0	0
Nonprofit	83	2	1	13	0	1
Industry / commercial	54	2	0	7	0	1
Private consultant	582	5	0	6	0	4
Regional entity	174	0	0	2	0	0
Watershed council/group	26	0	0	3	0	0
General public	871	0	0	19	1	6
Unknown	0	6	0	1	0	0
Total	5,137	94	25	394	36	36

Table 6. Information requests served in FY 2010 by StreamNet partner and by type of request.

<u>Request type</u>	<u>CRITFC</u>	<u>IDFG</u>	<u>MFWP</u>	<u>ODFW</u>	<u>WDFW</u>	<u>PSMFC</u>
Citing StreamNet / permission	5	0	0	1	0	2
Data request	0	33	6	14	19	9
General fish information	0			0	0	1
GIS data / map	0	31	14	211	16	9
Hardware / software technical support	3	19	2	80	0	0
Help finding information	5	4	1	31	0	8
Help with data interpretation / analysis	0	3	0	18	0	1
Help with data structure	0	0	0	5	0	0
Report error or problem	6	0	0	2	0	5
Library / documents	5,093	2	2	8	0	0
Information outside StreamNet's scope	25	0	0	0	0	0
Other	0	2	0	24	1	1
Total	5,137	94	25	394	36	36

Table 7. Outcome of information requests received in FY 2010 by StreamNet partners.

<u>Outcome</u>	<u>CRITFC</u>	<u>IDFG</u>	<u>MFWP</u>	<u>ODFW</u>	<u>WDFW</u>	<u>PSMFC</u>
Could only refer to other	64	2	0	29	0	1
Request fully satisfied	4,598	71	24	314	36	24
Request partially satisfied (may include referral to other source of information)	475	19	1	30	0	11
Could not help at all	0	2	0	13	0	0
Response pending	0	0	0	8	0	0
Total	5,137	94	25	394	36	36

Specific data dissemination actions by all project participants are summarized below:

Project Accomplishments During Fiscal Year 2010, summarized by Work Element

CRITFC	<p>The StreamNet Library began using digital social media (Facebook and Twitter, primarily) to advertise and market its resources and services. This is a development that other libraries have found useful and increases the collaboration between libraries in meeting user requests. The net result was more than a doubling of requests for StreamNet Library material, both from other libraries and directly from users.</p> <p>The project leader, members of the database management group, and others continued an ongoing data sharing dialog among the CRITFC-member tribes and with other regional natural resource managers. The discussion started with a tribal data management workshop in the spring, continued with an ongoing e-mail discussion among workshop participants, and with regional co-managers to develop a prototype data sharing project and workshop in FY2011. Agreement was reached in concept on ways to a distributed database structure among the tribes and CRITFC with use of web services to share and integrate information across databases. A search was begun for funding to implement the concept and build tribal data management capacity.</p>
FWS	<p>FWS supported the StreamNet project through continuing upgrades to the IT infrastructure with no cost to StreamNet. StreamNet related software was also updated throughout the year. These upgrades included new hardware in the forms of a new PC and a new server at the Columbia River Project Office. Data input and processing proceeded without problem throughout the year as winter Steelhead, spring, fall and up river bright fall Chinook, and coho runs progressed. This culminated with an on time submission of data in the appropriate DEF. Additional activities included participation in discussion of the DEF.</p>
IDFG	<p>IDFG recorded 134 data or technical assistance requests during fiscal year 2010. IDFG regularly used the StreamNet Web site and reviewed the new StreamNet web design.</p>
MFWP	<p>Spatial data and metadata were maintained and updated. DEF version 2010.2 was reviewed and comments were given during a technical conference call. The StreamNet website was used and an issue with querying fish distribution from multiple tables was forwarded to PSMFC. There were 59 fisheries information requests received this year. Draft aquatic layers using Montana's StreamNet data for the Crucial Areas Planning System (CAPS) were finalized for sport fish quality, sport fish life history, species of concern, aquatic connectivity, and watershed integrity. A draft mapping service was developed for CAPS and the final mapping application and supporting documentation was deployed to the FWP public web site in April: http://fwp.mt.gov/wildthings/conservationInAction/crucialAreas.html. CAPS has received an average of 550 unique visitors each month, with each visit lasting an average of 5 minutes; StreamNet data was used to create 5 of the 16 layers within CAPS. Restoration project data have been provided to Montana's statewide effort.</p>
ODFW	<p>ODFW StreamNet provided functionality-related feedback to Regional StreamNet staff throughout the year. We managed ODFW websites and interactive map applications to improve agency data flow to users and to StreamNet. Conflicting priorities again prevented us from tracking web usage statistics. We may abandon this effort completely, as target measures of success have shifted away from web site hits. We enhanced data access by providing thousands of updated fish habitat distribution and fish passage barrier maps in PDF format, ODFW Boundaries, and ODFW Facilities datasets and several other datasets to ODFW GIS users. Responses to requests for data and information (Tables 1, 2 and 3) represented another significant increase over past years. This continues a trend of increasing requests coming to the project, taking more time to fulfill and taking more time away from other project tasks.</p>
Region	<p>The Region continued to maintain its website as the primary means of distributing data from the StreamNet database, with up-time greater than 99/9%. The Region worked with the StreamNet Library staff to better integrate the library website with the main StreamNet website. Metadata were posted as web services allowing StreamNet data to be located through portals such as NBII and Geospatial One-Stop. Improvements were made to the site, including addition of a project calendar feature and news features. A new approach to uploading data sets to the Data Store was designed, with implementation in the first quarter of FY-11, and work began to redesign the approach used to query the StreamNet database. Regional staff responded to 36 data and information requests, with response times less than one business day. Project accomplishments and capabilities were presented to several professional meetings, including Oregon AFS, Western Division AFS and the Organization of Fish and Wildlife Information Managers.</p>
WDFW	<p>During this period, WDFW StreamNet staff responded to 36 data requests. In a more general sense, our agency continued with efforts to make all fish data available through our web-based Salmon Conservation Reporting Engine (SCoRE). Additionally, we assisted PSMFC in website improvements through discussions at Steering Committee</p>

Work Element 189: Coordination

The StreamNet project coordinated with a number of regional entities and other agencies during the course of the year. The project remained active in the Pacific Northwest Aquatic Monitoring Partnership (PNAMP), serving on the Steering Committee, Data Management Leadership Team, Effectiveness Monitoring Work Group, Metadata Work Group, the ISTM project, and other related efforts. We also continued to make the CBFWA Status of the Resource (SOTR) report a high priority, and became very active in the Coordinated Assessments effort being led by CBFWA in conjunction with PNAMP and BPA. Actions related to coordination are summarized below:

Project Accomplishments During Fiscal Year 2010, summarized by Work Element

CRITFC	Coordination is a founding concept of the StreamNet project since it was first funded in 1988 as the Coordinated Information System. Achieving that necessary coordination has been uneven over the intervening 22 years, but progress accelerated substantially in FY2010. CRITFC is playing a critical interface, improving information coordination among our member tribes and with other natural resource and information management agencies. Significant milestones in FY2010 were a) reestablishment of an active data management dialog and projects among member tribes, b) use of new common technology among regional libraries and users, and c) more active dialog and development of prototype projects among regional natural resource managers.
FWS	The Project Lead coordinated CRiS activities of hatcheries and fisheries offices, and participated in StreamNet Steering Committee coordination efforts.
IDFG	IDFG StreamNet continued to play an important role in the development of state-wide databases that feed data to StreamNet and other Columbia River basin entities. Close coordination included IDFG, Nez Perce Tribe, Shoshone-Bannock Tribes, Oregon Department of Fish and Wildlife, Idaho Power Company, and the US Fish and Wildlife Service via the Lower Snake River Compensation Plan. Key databases included the hatchery and spawning ground surveys. IDFG StreamNet staff also coordinated closely with the IDFG CBFWA representatives on high level indicators and coordinated assessments. We completed the initial coordinated assessments pilot project on the Marsh Creek population of Chinook salmon. We provided training and technical support on the use of the spawning ground and hatchery databases. The IDFG StreamNet project manager coordinated with the Western Governors Association Decision Support System efforts for the Oregon-Washington-Idaho and the Idaho-Montana pilot projects.
MFWP	Montana StreamNet staff have attended and participated in numerous meetings this year and given CAPS presentations at MFWP Fisheries Bureau meetings, MCAFS, the Intermountain GIS Conference to name a few. Staff will be participating in the Western Governors' Association pilot project with Idaho which relates directly to the use of StreamNet data from both states. Staff exchanged fisheries data to the Natural Heritage Program for inclusion into their Point Observation Database. A meeting between MFWP, USFWS, USFS, and NRCS regarding bull trout data was held with an outcome of developing a system for better data quality flowing into MFWP and onto StreamNet.
ODFW	ODFW StreamNet was able to provide significant support to the Fish and Wildlife Program (FWP), the most time consuming being related to the Coordinated Assessment work. We placed considerable focus on partnering with other data source agencies to significantly enhance the content and collaborative stewardship of Oregon's fish passage barrier and distribution datasets. We also gave significant attention to supporting CBFWA's SOTR report this year, updating all SOTR data summaries contained in the StreamNet data system and responding to specific data requests as needed. Coordination of Oregon's data and data management efforts is taking an increasing amount of time, but is beginning to pay dividends as more agency staff are supporting and seeking improvements within their respective Programs. The development of a decision support system in Oregon, along with the coordinated assessments, monitoring and evaluation, and recover planning efforts should place a greater emphasis on improving data management.
Region	Regional StreamNet was quite active during the fiscal year in a variety of coordination activities. Project staff members served on the PNAMP Steering Committee and Data Management Leadership Team and were active in the Metadata and Effectiveness Monitoring work groups. Significant effort was expended in support of the Coordinated Assessments being lead by CBFWA in conjunction with PNAMP. The goal of the Coordinated Assessments is to develop data sharing capabilities in the agencies and tribes to support regional scale reporting regarding progress toward recovery under the BiOp. StreamNet participated in the planning team, worked on development of the Data Exchange Template, and conducted the initial pilot efforts to obtain the primary Indicators for three test populations.
WDFW	WDFW participated in creating and refining quarterly SOW elements through quarterly Steering Committee and Technical Committee meetings. Additionally communication was made with data stewards from the Colville Tribe in order to facilitate compilation, updating and submission of their data into StreamNet. Ongoing coordination with PNAMP continued, with significant work done on the ISTM project. Staff members were also directly involved with the Coordinated Assessments being conducted by CBFWA in conjunction with PNAMP.

Work Element 119: Project Administration

As a mature project, project administration was largely routine. All project participants contributed to project guidance through the quarterly Steering Committee and technical meetings. All project staff received routine supervision in their work to accomplish milestones outlined in the annual Statement of work. Expenditures were monitored to operate within approved budgets. And all participants contributed to developing the Statement of Work and budget for FY 2011. Individual out of the ordinary efforts were as follows:

Project Non-routine accomplishments During Fiscal Year 2010, summarized by Work Element

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|--------|---|
| CRITFC | Several opportunities were identified to move the StreamNet Library in new directions, including expanding digital collections, more efficient use of space with compact shelving, and greater Internet access. The small annual budget increases (2.5%) and inflationary pressures on other costs limit our ability to do so, however. |
| MFWP | Montana's participation in StreamNet Steering Committees decreased due to a focus on anadromous species assessments. The StreamNet Data Manager participated in numerous technical committee conference calls. Work planning sessions were held with our new Bureau within GFP. |
| ODFW | Two Data Technicians were hired to replace staff who moved on to other positions, and a third was hired to focus on recovery planning data efforts. |
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Work Element 132: Annual Report

All project participants contributed reports of their activities in FY 2009 to PSMFC, which consolidated all input and produced the annual report. The FY-2009 Annual Report was uploaded to Pisces on schedule at the end of November, 2009.

Work Element 185: Produce Pisces Status Report

All project participants contributed their activities to the periodic Status Reports in Pisces. CRITFC reported on a monthly basis, as agreed within their contract. PSMFC submitted the Status Report for the rest of the project participants on a quarterly basis, with the report submitted by the 15th of each month following the end of the quarter, except for the fourth quarter report, which was submitted on the last day of the quarter, August 31, 2009.

Appendix A
Project Accomplishments by individual Work Element Titles

Work Element: 159 Transfer/Consolidate/Regionally Standardize Data

Work Element: 159 Transfer/Consolidate/Regionally Standardize Data

Title: 1 Conduct site visits to obtain updated data from biologists

Description: Conduct scheduled site visits to offices of biologists in state, tribal and federal agencies to obtain the most recently available field data. This approach is used by only one of the agencies cooperating in the StreamNet project.

Deliverable: New data are obtained by the MFWP StreamNet project to update the data categories listed in the other Data Development work element titles.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

MFWP Montana StreamNet staff completed all visits with biologists and obtained the requested data for all regions.

Work Element: 159 Transfer/Consolidate/Regionally Standardize Data

Title: 2 Develop anadromous fish distribution data

Description: Document the occurrence, distribution and life history characteristics of anadromous fish species. These data will be georeferenced to the StreamNet mixed scale hydrography, with intent to migrate to 24K when a regionally consistent 24K routed hydrography becomes available. Maintenance of this high priority data set will continue. The state StreamNet sub-projects will maintain the existing data on anadromous fish distribution and habitat use in their respective states. New distribution information will be incorporated as they become available. Updated distribution data will be converted to the regional Generalized Fish Distribution format and conveyed ("exchanged") to the regional StreamNet database at PSMFC, where they will be incorporated into the database.

Deliverable: Data on the distribution and habitat use of anadromous fish are maintained, and updated as possible, by each of the state StreamNet sub-projects. Updated data are exchanged with the main StreamNet database at PSMFC and made available through the online data query system and interactive maps.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

IDFG New stream survey sites were georeferenced. We developed a batch data entry spreadsheet for the collecting permit database which feeds our generalized fish distribution layer. We compiled collecting permit report data and helped collectors format their 2009 data into the database template in preparation for appending to the database. The shape files for the stream survey were updated in preparation for intersecting with the new MSH in order to update the Idaho generalized fish distributions.

ODFW Routine data maintenance was performed as needed. We created new habitat distribution datasets for winter and summer steelhead as well as Coho based on new data in NE Oregon, and made various data quality corrections, changes and updates in several areas of the State. Pacific lamprey data were processed into the Oregon Fish Habitat Distribution Standard (OFHDDS) format and incorporated into the corporate OFHDDS database. Coho observation data from Western Oregon Rearing Project surveys were converted into records within the Fish Habitat Distribution database. Approximately 100 miles of Coho habitat in the coastal basins were added based on observations outside of existing Coho habitat. All fish habitat distribution database records developed this fiscal year were then converted into StreamNet format, assigned StreamNet mixed scale hydro specific measures and submitted to the StreamNet database at PSMFC.

WDFW Early this year staff concentrated on refining and packaging WDFW fish distribution data to answer common questions and for more accurate and easier presentation and delivery. In a related effort, we learned of discrepancies in WDFW fish distribution data with upper Columbia River Tribal data. WDFW StreamNet staff teleconferenced with Colville Confederated Tribe (CCT) staff to discuss the existing but inaccurate fish distribution representation. We made plans to first revise the WDFW database for these known issues then package the records for further discussion with CCT before re-submitting the data to PSMFC. We delayed updating while we assessed how to just make the known corrections directly in the StreamNet database. We found that a) Most of these deletions do not affect the current StreamNet representation, and b) We need to refine the process for communicating changes to existing records. Simply reviewing & discussing a map doesn't convey complete understanding (possibly because a viewer may assume a displayed line is stream X yet stream X may start further upstream and take a different route). It will behoove us to finalize the extra CCT barrier data before fish distribution is finalized.

No further work toward this end was carried out in the latter portion of this year. Data will be re-converted and submitted in FY2011 for the Walla Walla and Grande Ronde basin after Mixed Scale Hydro (MSH3) is adopted.

Work Element: 159 Transfer/Consolidate/Regionally Standardize Data

Title: 3 Develop resident fish distribution data (top priority for MFWP, lower priority for others)

Description: Document the occurrence, distribution and life history characteristics of resident fish species, at the most current available hydrography scale. Existing resident fish distribution will be maintained, and project participants will begin expanding data for additional species. This is high priority for Montana, and new data will be developed by the other states as time allows. Updated distribution data will be exchanged to the regional StreamNet database at PSMFC, where they will be incorporated into the database.

Deliverable: Data on the distribution and habitat use of resident fish (species of primary interest) are maintained, and updated as possible, by each of the state StreamNet sub-projects. Updated data are exchanged with the main StreamNet database at PSMFC and made available through the online data query system and interactive maps.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

IDFG New stream survey sites were georeferenced. We developed a batch data entry spreadsheet for the collecting permit database, which feeds our generalized fish distribution layer. We compiled collecting permit report data and helped collectors format their 2009 into the database template in preparation for appending to the database. Lake survey and stocking data were georeferenced for the developing lake survey database.

MFWP 1,211 Fish distribution records for resident fish species were added or updated this year and submitted to StreamNet

ODFW Fish Distribution GIS datasets were acquired from the U.S. Forest Service for the Ochoco and upper Deschutes basins. These data, along with ODFW's data for the Burnt, Powder, and Lower Snake basin Redband were migrated from the existing 100k hydrography to the 1:24,000 scale Framework hydrography. The Lower Snake data were converted to the Oregon Fish Habitat Distribution Data Standard (OFHDDS) format, while the Burnt / Powder are still undergoing district review and revision. Draft datasets based on whitefish and brook trout observations were also created and provided to ODFW biologists for review and comment. In addition, Interior Columbia Basin Ecosystem Management Project data were compiled across Eastern Oregon in order to develop 5th field watershed level data to support the Division 33 effort.

Oregon Dept. of Forestry (ODF) fish presence datasets obtained during the last fiscal year were used to create draft coastal cutthroat trout habitat maps in the Clatskanie basin and the four fish districts within the Willamette basin. Staff also initiated processing of Young / Lewis and Clark basin ODF fish presence data into cutthroat habitat distribution records. Migration of 100k linear and 24k point cutthroat data in the Hood basin to the Oregon mixed scale hydrography dataset was completed. Previously developed Hood River basin cutthroat fish habitat distribution data (circa 2002) were converted to the OFHDDS format. From the ODF fish presence survey data, Upper Willamette 1:100,000 scale professional opinion cutthroat habitat and also Hood basin cutthroat habitat data, a coastal cutthroat fish habitat distribution dataset was compiled for the Willamette and Lower Columbia basins. All data were converted to the OFHDDS format; however the linear referencing component was not populated, so it was submitted as an independent dataset.

Brook lamprey habitat distribution data were processed into the OFHDDS format and incorporated into the corporate OFHDDS database. All fish habitat distribution database records developed since Sept 2009 were converted into StreamNet format and assigned StreamNet mixed scale hydro specific measures.

WDFW The WDFW Location Data Manager began researching the \Species\Run\SubRun\LifeHistory\ code cross-references for a resident FishDist submission and, if warranted, to guide WDFW to adopt different conventions for better data sharing. She also integrated Rainbow\redband corrections into the WDFW working file. WDFW updated internal working files (including redband and rainbow corrections). This data manager is attempting to resolve some outlying questions in the data so that the data will be converted and submitted to StreamNet.

Work Element: 159 Transfer/Consolidate/Regionally Standardize Data

Title: 4 Develop data for adult abundance in the wild

Description: Develop and maintain (update all annual trends) information on adult abundance for native fish species, resident and anadromous, including escapement, redd counts, peak spawner counts, trap counts, dam and weir counts, and resident fish populations (where calculated by other agencies). This is a high priority data type. Also included in this data category are data gathered during spawning ground surveys regarding straying of hatchery fish onto spawning areas, i.e., marked / unmarked ratio and age and sex composition. These are lower priority under level funding. Updated data will be exchanged with the regional StreamNet database at PSMFC at least once per year in the Data Exchange Format (DEF).

Deliverable: Data on the abundance of fish (primary emphasis on focal species) in the wild are maintained and updated by each of the state StreamNet sub-projects. Updated data are exchanged with the main StreamNet database at PSMFC.

<u>Project</u>	<u>Accomplishments During Fiscal Year 2010, summarized by Work Element Title</u>
IDFG	Redd count and carcass data from the old Redds database were merged into the new Spawning Ground Survey database. We tested and built queries and reports to access the data in preparation for our users and StreamNet. We submitted the 2008-2009 spring/summer Chinook salmon redd counts to StreamNet. Redd count and carcass data for 2009 from the Shoshone-Bannock Tribes, Nez Perce Tribe, and U.S. Forest Service were compiled. We helped enter the 2009 USFS, SBT, and NPT redd counts into the spawning ground survey database and submitted them to StreamNet.
MFWP	Coordination continued on the centralized Intercontinental Cutthroat Trout Protocol proposal. Westslope cutthroat trout data became available and data were transferred to StreamNet staff for inclusion in the central database.
ODFW	Data compilation, trend updates, & QA/QC efforts for adult abundance trends continued throughout the year, though efforts were reduced from previous years because of a redirected focus on supporting the Regional Coordinated Assessment effort. However, focused attention was given to obtaining data supporting focal species in the SOTR in all subbasins. 3,768 Status of the Resources "Focal Species Trends" were added or updated (of which 496 Trends are used directly in the Status of the Resources Report). Emphasis was also given to reviewing and updating 35 trends related to 3 Portland General Electric projects. Updates were submitted to Regional StreamNet in April and September, as scheduled, amounting to 1,154 (2,673 escapement data records) added or updated trends. These trends were in the following data types: Adult Return-Dam/Weir counts, Adult Return-Estimates of Spawning Population, Adult Return-Redd counts, and Adult Return-Peak/Other Spawning Counts. These updates ranged in years from 1946 to 2010. The year's work brings the total number of Oregon abundance trends to 9,191 spanning the years 1938 through 2010.
WDFW	In the first quarter of FY2010 WDFW data compilers worked on separating Columbia River chum peak counts and escapement numbers into separate trends, completed updating location changes and worked on QA/QC for the CatID 1 change to some trends and submitted the data to PSMFC with any associated updates and changes for locations, escapement numbers and age. Additionally, WDFW staff adapted an older database for a tangle net fishery to fit the new alternate gear sampling fishery, then combined the three years of data collected for the tangle net fishery that were separate databases into one master database. From this effort we were able to update the Cedar Creek database with the current year's data entry. Additional tables were developed from this data set for biological analysis. Historical and current barrier, spawning, escapement, dam counts, juvenile steelhead counts, and redd counts from the Colville Nation were exchanged during the first quarter. WDFW staff completed research and formatting of new Okanogan and Wenatchee basin sockeye, steelhead and Chinook redd count data. These data are in the final stages for submission. New redd count and carcass data for Tucannon Fall Chinook were formatted for submission. Final permission was received from the U. S. Forest Service and U. S. Fish and Wildlife to publish bull trout redd counts for the Okanogan and Wenatchee basin. Work in these basins is carried out jointly by both agencies. Late in the fiscal year, WDFW staff members were able to enter all 2009 chum stream survey cards into the SGS database as well as review any data uploaded from the USFWS chum surveys. The Olympia data compiler finished & submitted Okanogan / Methow / Twisp / Wenatchee basin trend and escapement records for USFW and USFS bull trout redd surveys. This work is our first foray converting data already in LLID format but an LLID that is relevant to the USFS hydrography. WDFW compiled and submitted 2009 return data updates from WDFW, USFS, Colville Nation, and Yakima biologists. Data from Colville juvenile steelhead surveys are under review and will be updated in a new comprehensive report to be published at an unknown time later in 2010. Finally, the Olympia data compiler worked on conversion of historical data for adult traps on the North Fork of Toutle River and Kalama River. The data were normalized and pilot data were entered in a draft data entry application.

Work Element: 159 Transfer/Consolidate/Regionally Standardize Data

Title: 5 Develop hatchery return data

Description: Develop (update) and maintain hatchery trend information on the return, disposition and straying (e.g., from other hatcheries) of adult fish returning to hatcheries, including information on coded wire tags. This is an anadromous related task only. Priority will be placed on updating total return and egg take data through 2009. Development of disposition data is lower priority and would require additional resources. Updated data will be exchanged with the regional StreamNet database at PSMFC at least annually. This is a CBFWA Priority 2 data type.

Deliverable: Data on the return of anadromous fish to the hatcheries are maintained and updated by the states and FWS StreamNet sub-projects. Updated data are exchanged with the main StreamNet database at PSMFC.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

FWS Hatchery data were received from all national fish hatcheries and for all species, and data were processed and sent to PSMFC for addition to the StreamNet database.

- IDFG We aided hatchery personnel in the entry, access, and management of 2009 hatchery return data for Chinook salmon and steelhead. We tested the updated hatchery database system for use by an ODFW hatchery. We assisted with the compilation of spawning data for Chinook salmon and steelhead. The Shoshone-Bannock Tribes fisheries personnel were assisted with installation and training for the Hatchery and Spawning Ground Survey applications. Links to external tables were repaired and queries run to generate tables of Escape, Trend, and Reference data. These were verified against the hatchery report totals and submitted to PSMFC for inclusion in the StreamNet database.
- ODFW Hatchery return data were updated through 2010 from all hatcheries where data were available. Of 170 trends, 55 are now updated through 2010, 38 through 2009, 44 are between 2000 and 2008, and 33 have updated information that ranges between 1943 and 1999, primarily because there was no new information. Oregon submitted 2,253 hatchery return records (155 Trends) along with 12,696 disposition records. We continued to struggle with obtaining accurate egg-take information and matching that up with return records. Efforts to refine the export process and acquire/match egg-take information will continue in FY-2011 if time and resources allow.
- WDFW The WDFW data managers delivered all 2008 hatchery returns data for the state of Washington to PSMFC for inclusion in the StreamNet database. Updates were made to existing hatchery returns location data and also submitted to PSMFC. During the course of the year we learned of some hatchery management practices which may affect the hatchery returns cross-references. The cross-referencing will be re-assessed in FY2011 before the next hatchery return submission.
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Work Element: 159 Transfer/Consolidate/Regionally Standardize Data

Title: 6 Develop dam and fish passage facility data (mid-priority), update on 3 year cycle

Description: Data on dam and fish passage facilities will be maintained and updated only on a periodic basis. Previously compiled data of this type will be maintained. Information will be updated on a rotating schedule every three years, beginning in FY-08, with no new data scheduled for FY-10. This is a CBFWA Priority 3 data type.

Deliverable: Existing data on dam and fish passage facilities are maintained. This lower priority data set will be updated and exchanged with the main StreamNet database at PSMFC on a three year rotating basis, beginning in 2008.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

- IDFG No dam update work was scheduled for this fiscal year, based on the three year cycle for this data type.
- MFWP 1,410 Survey locations and 9,823 survey results were added or updated and submitted to PSMFC for inclusion in the StreamNet database on 9/1/2010.
- ODFW ODFW staff coordinated with the Oregon Water Resources Department to update and correct dams data, rectifying any discrepancies found. We added 623 new dams to the Oregon database and updated/replaced 646 dams.
- WDFW No dam update work was scheduled for this fiscal year, based on the three year cycle for this data type.
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Work Element: 159 Transfer/Consolidate/Regionally Standardize Data

Title: 7 Develop hatchery facility data (key dataset), update on 3 year cycle

Description: Develop and maintain information on all hatchery facilities, including information on location, design, management and authorization. Information will be updated on a rotating schedule every three years, beginning in FY-07.

Deliverable: Data on hatchery facilities are maintained and updated by the state StreamNet sub-projects. Updated data are exchanged with the main StreamNet database at PSMFC on three year rotating basis, with a full updated scheduled in FY-2010.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

- FWS Hatchery facility data were maintained, but no changes were needed to this file this year.
- IDFG Data on the Cow Creek, Horse Creek, and Sheep Creek steelhead weirs run by the Nez Perce Tribe were compiled and georeferenced. Eight hatchery records were updated in the StreamNet database where the mailing address county did not equal the county in which the facility is located.
- MFWP Hatchery facility data were maintained, but no changes were needed to this file this year.
- ODFW Attributes for 78 records in the facility table were validated or updated using agency documents back to 1960, communication with managers and Internet websites. Much attention was given to outflow, fishway, and location (coordinates and linear referencing on the StreamNet mixed scale hydrography) information, ensuring that all facilities related to hatchery return data were included and updated. Information on 55 facilities was exchanged, replacing all hatchery records for Oregon.

WDFW WDFW staff Internally continued to collect and update new or more accurate facility locations data. We reviewed the "hatcheries" cited in www.hatcheryreform.us and began cross-referencing the features that seem to be missing from the StreamNet data set and verifying feature locations and actual purpose. Many features described as a hatchery can merely be a rearing pond, fish wheel or other facility.

WDFW's effort to create a centralized reporting system (SCoRE) drew (and continues to draw) attention to missing pieces of information needed to manage hatchery facility data. Over time this attention may lessen the confusion/conflict arising between the facility lists and mapping preferences versus the facility referenced in returns and release data. The Location Data Manager updated internal files with the latest information and resubmitted the hatchery table in October 2010.

Work Element: 159 Transfer/Consolidate/Regionally Standardize Data

Title: 8 Develop hydrography data, including stream, lake and reservoir layers

Description: Archive the regionally consistent routed hydrography layer at the 1:100,000 (100K) scale for which StreamNet is the official keeper, and adopt use of the Mixed Scale Hydrography for depicting StreamNet data. In FY-10 the 100K hydrography will be archived but not updated, although it will still be available for use. Emphasis this year has shifted to the StreamNet Mixed Scale (100K plus 24K streams that have attached fish data) Hydrography as a step toward the eventual conversion to 24K when a regionally consistent routed 24K hydrography becomes available from other entities. Effort will also be expended toward developing 24K LLID based hydrography from NHD linework. The lakes and reservoirs layer will also be maintained. These are essential data for georeferencing all other data.

Deliverable: The 1:100,000 PNW hydrography layer and lakes layer are maintained and archived for use a by others. The new StreamNet "mixed scale" (100K X 24K) hydrography is used for georeferencing StreamNet data until a fully routed PNW 1:24,000 scale NHD is completed by USGS.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

IDFG We implemented a new, more automated system for adding new streams to our 1:100,000 scale hydrography. Using non-StreamNet funds, we began a process to create LLID routes on top of Idaho's 1:24,000 scale National Hydrography Dataset. We updated and submitted Lemhi Big Springs Creek (Lemhi River basin) hydrography to PSMFC.

MFWP Coordination between MFWP and MT NRIS on Montana's hydrography including staff participation in a NHD conference call regarding harmonization of Canadian hydrography and the NHD and several calls and meetings regarding LLID events on NHD routes. Unfortunately, progress on the pilot project by NRIS to integrate NHD and LIID was not as significant as hoped due to a shift in NRIS workload priority.

ODFW Routine maintenance was performed. Coordination with Regional StreamNet staff and StreamNet partner agencies occurred throughout the year as needed. Lingering issues related to integrating cross-border streams into the mixed scale hydrography (MSH) dataset were addressed. The Oregon mixed scale hydrography dataset in the Hood basin was edited in order to support mapping of existing cutthroat habitat distribution data (being migrated over from 100k lines and 24k points). Updated MSH information was submitted to PSMFC in February.

Oregon StreamNet staff participated in several meetings to discuss a methodology for creating LLID events on top of National Hydrologic Dataset (NHD) geometry. These events could then be used to create an LLID-based route system on the NHD geometry. The most significant issue remaining with creating LLID routes on NHD geometry is the maintenance of the LLID route systems as the NHD is updated. Much time was spent reviewing version 2 of the regional MSH dataset and metadata, with an emphasis on ensuring that previously submitted ODFW data maps properly. Comments were provided to Regional StreamNet staff in April.

WDFW WDFW StreamNet tested ways to accurately identify which arcs need to be flipped for the best continuous routing. Ditches or canals make it difficult (or impossible) to automate this process. We internally edited the hydrography to flip as few arcs as warranted, updated HUC attributes and added pseudo-NHD fcodes and ftypes. WDFW continued to work on pilot projects to test the process of converting WDFW data and linework to NHD.

In concert with a data request to georeference select resident fish releases, we began making improvements to the WDFW lakes layer which continued thought the year. We finished two phases of internal improvements to the Washington Lake layer and coordination of data georeference updates. Work will continue throughout the fiscal year. Upon request, the draft lake layer was submitted to StreamNet.

We also started creating CAT routes. This differs from existing products in that it will be the original Stream Catalog linework and not an attempt to fit the original representation to the agency linework of any moment. Instead, it will be used to convert any data based on the Stream Catalog to any hydrography of the moment.

The Mixed Scale Hydrography (MSH2) was maintained and a few extra streams were added.

During the course of the year we reviewed the internal HyrdoDif tool. As purposely designed, the tool output catches very small differences. As such the differences are too minute to be relevant to identifying full stream georeferences. Future work will test if the tool input can be revised in a way to catch just larger routing differences between the USFS LLIDs vs. WDFW LLIDs. For example, running the tool on a lower and upper half of each stream may yield comparisons that catch the occasions where the separate sources route the upper half of a stream differently.

The StreamNet GIS managers met with the WDFW SCoRE manager (a sql based reporting system for a variety of data). Per deadline, SCoRE finished the first phase of the system in July. The following year and phase will address the georeference components and re-engineering. Besides creating a reporting system, SCoRE improves our old practices by creating a single hub to many internal data types.

GIS managers teleconferenced with NOAA to coordinate more work on georeferencing internal Stream Catalog Rms.

Upon ODFW's suggestion to adopt NHD linework for cross border drainages, we agreed to tackle the Grande Ronde and Walla Walla basins for a mixed scale hydro update (MSH3) for Fall 2010. We piloted procedures on the Grande Ronde basin (limited to the linework where WDFW has responsibility). We are currently working on the Walla Walla basin, addressing both the WDFW and ODFW streams to hopefully expedite the MSH3 adoption.

We continued discussion with NOAA's Mindi Sheer regarding their project to use Spawning Ground Survey location codes and measures. We organized the georeferenced rasters of the Stream Catalog maps (CATmaps) as they came in and worked with NOAA to revise some practices for better organization. Work and discussions continue.

WDFW fielded a large data request from another NOAA faction and awaits further feedback from NOAA's Michael Carey and Katie Barnas to learn how we reasonably can help NOAA's effort.

To aid a new internal database collection, WDFW created key points (and subsequent georeferences) referenced in Columbia river and slough harvest and harvest sample locations. We also gathered new points or confirmation of existing points for traps, hatcheries, etc.

Work Element: 159 Transfer/Consolidate/Regionally Standardize Data

Title: 9 Develop fish barrier data, update on 3 year cycle

Description: Develop and maintain data sets for barriers to fish migration. Delivery of this new data type will be on a rotating basis every three years beginning in FY-09. Efforts in FY-10 will focus on maintaining existing data.

Deliverable: Data on fish barriers are developed and maintained by the state StreamNet sub-projects. Updated data are exchanged with the main StreamNet database at PSMFC on 3 yr rotation beginning FY-09. New sources of barrier data are located. For FY-10 existing data are maintained.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

IDFG Existing barrier data were maintained. In addition, we helped update and compile barriers as part of the 2009 Westslope Cutthroat Range-wide Assessment.

MFWP Existing barrier data were maintained; 120 Barrier records were added or updated.

ODFW Effort continued this year incorporating new barrier information into the ODFW barrier dataset and converting those data to the Framework and/or regional hydrography. An updated ODFW Barrier dataset and metadata were published to the ODFW website in October. We acquired and/or incorporated data from the U.S. Forest Service (Santiam, Siuslaw, Clackamas, Calapooia, and Scappoose basins), ODFW's Western Oregon Rearing Project, the Oregon Department of Transportation (ODOT), and Benton, Wallawa, and Washington counties. We also investigated ODFW's Aquatic Inventory Project and Oregon Dept. of Forestry for fish passage barrier data. Issues need to be addressed before these data can be incorporated. This work, coupled with work done outside the basin using other funding, resulted in a new statewide barrier dataset, including refined metadata that maps to the Oregon mixed scale hydrography layer. We converted the ODFW Barrier Table (9,011 records) to the StreamNet exchange format, migrated event measures to the anticipated regional MSH and delivered all information to PSMFC StreamNet along with corresponding metadata.

WDFW Existing barrier data were maintained. No additional work was scheduled because this was an off year for this data type.

Work Element: 159 Transfer/Consolidate/Regionally Standardize Data

Title: 10 Develop fish age data

Description: Develop and maintain information on age/sex composition of returning adults, primarily for anadromous species. This is a CBFWA Priority 2 data type.

Deliverable: Data on age composition of returning adult fish is available through the StreamNet website.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

CRITFC	The estimated fish age data from 2009 was verified with dam counts data received from the Fish Passage Center's website in September 2010. The data included fish counts from 1/1/2009 through 12/31/2009. These data were used to estimate the number of fish in each age class that passed through the Bonneville Dam in 2009. The data CRITFC collected in the field was expanded to the dam counts data. The data were then transformed to maintain consistency with the StreamNet format for fish age. After the data were transformed, we emailed the data to PSMFC. These data are connected to a library reference (2010) that will pull up the updated Bonneville Age data report for 2009. Additionally, we set up an account to log in to the StreamNet X external SQL database. This gave us the ability to verify that the data would be in the correct format.
FWS	Age Composition information was sent to Regional StreamNet after reading all scales and coded-wire tags, and processing.
IDFG	We continued to support fishery research staff compiling Chinook salmon and steelhead age composition data from the hatchery database. Problems with length frequency data were corrected and analyses will now proceed. Post-run derived age data were located and we received permission to submit them to StreamNet. Work began in the fourth quarter to format these data.
ODFW	No updates were required this year. New data were not made available during this fiscal year.
WDFW	WDFW StreamNet worked on updating corresponding ASNIDs for the peak counts and escapement numbers for the chum trends and submitted them to PSMFC. We also began discussions with Regional biologists to determine the extent of steelhead age data there for future data collection and exchanges. We completed the 2009 natural spawn age escapement estimate collection and delivered it to PSMFC. The 2008 hatchery returns age data were completed and delivered to PSMFC. The location look-up tables were updated for the internal scales and age databases.

Work Element: 159 Transfer/Consolidate/Regionally Standardize Data

Title: 11 **Develop other data sets**

Description: On an opportunistic basis, develop other types of data as available or as requested by FWP participants. This relates to data relevant to StreamNet objectives which would be developed by StreamNet cooperators and also includes data developed by other agencies or projects. Actual acquisition, standardization, georeferencing and distribution of these data will be dependent on available time and funding. These data may be included in the DEF in the future, or may be obtained and distributed as independent data sets in native format in the Data Store. Priority for development of other data by StreamNet varies depending on the data type for each participating agency. Receiving and posting independent data sets from other entities in the Data Store is a high priority.

Deliverable: Other fish related data (in addition to the standard StreamNet data categories) are obtained, preserved and made available through the StreamNet website as they become available on an opportunistic basis. Data sets that do not fit into the StreamNet data exchange formats are posted as independent data sets in their native format in the StreamNet Data Store.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

CRITFC	In addition to the fish age data, the estimated fish escapement data was also transformed to StreamNet's format and sent to PSMFC. Other data sets not being submitted to the StreamNet database include data gathered from the Grande Ronde subbasin, including temperature, flow, water chemistry, and biological data collected over the past two years at numerous locations within the Grande Ronde Subbasin.
IDFG	We submitted the 2009 Westslope Cutthroat Trout Range-wide Assessment database, associated layers, the assessment report, and the assessment protocol to the StreamNet Data-Store.
MFWP	133 genetic sample locations and 198 sample results were added and the data were submitted to the StreamNet Data Store as an independent data set. 87 restoration projects were added or updated and these data were submitted to the StreamNet Data Store as an independent data set. Work on an agency wide restoration database was initiated.
ODFW	No requests were received to post independent datasets from Oregon. Updates to data sets other than those previously mentioned were submitted along with other scheduled data exchanges, including 96 freshwater/estuary harvest trends (1956 - 2007) and 2 updated/corrected juvenile abundance trends for the years 2003 - 2008. These were not called for in this year's SOW, but were obtained opportunistically and submitted. We also spent time checking and correcting location information for approximately 200 winter steelhead harvest trends. Because there is no current DEF for juvenile abundance data, these data were submitted with the escapement trend data. In addition, we searched for smolt trapping data and information in the Lower Columbia for a project proposed by StreamNet to build a smolt trapping database. We also worked with ODFW staff to obtain updated carcass placement tables, but time and resources did not allow us to make these data available.

Region Seven new or updated data sets were received and added to the StreamNet Data Store. These were:
 Montana trout genetic sample analysis data (from MFWP).
 MFWP fish population surveys (from MFWP).
 Enhancing Summer Instream Flow and Reducing Temperature in Agricultural Watersheds (soil and water data) (from Washington State University).
 Nez Perce Soil & Water Conservation District 2009 Stream Temperature Data (from NPSWCD).
 Yellowstone cutthroat trout 2009 assessment review data (from MFWP).
 Westslope cutthroat trout 2009 status assessment (from IDFG).
 Spawning Ground Surveys Related to the Salmon River Habitat Enhancement Project (from Shoshone-Bannock Tribes).

WDFW WDFW spent a great deal of effort attempting to develop other data sets this year. Of particular note is our ongoing effort to consolidate and modernize internal data sets through our Salmon Conservation Reporting Engine (SCoRE) effort. In this endeavor, WDFW is modernizing and connecting most internal Fish Program data sets with the preemptive end goal being to create a mechanism to report on anticipated emerging regional VSP reporting needs. This includes, but is not limited to the scope of the Columbia River Coordinated Assessments effort. Additionally, WDFW has been developing and submitting salmonid genetics data to the StreamNet Data Store as an independent data set.

Work Element: 159 Transfer/Consolidate/Regionally Standardize Data

Title: 12 **Document data sources and help build the library collection**

Description: StreamNet project participants will acquire documents, reports, publications and agency reports (gray literature) that document data sources for the data included in the StreamNet database or that relate to Fish and Wildlife Program activities and fish and wildlife resources in the Columbia Basin and the Pacific Northwest and submit them to the StreamNet Library at CRITFC for access by regional scientists, agencies, interested parties and other libraries.

Deliverable: The collection in the StreamNet Library is increased by addition of pertinent publications and reports and by reference documents supporting the data added to the StreamNet database.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

CRITFC Each of the participating agencies submitted the relevant reference documents for their data submissions. These documents were added to the StreamNet Library catalog and the documents are available for use by researchers and the

FWS No new StreamNet materials were sent to the Library this year.

IDFG Electronic data set references for the 2008-2009 redd count data were created and submitted to StreamNet. We suggested ideas to the StreamNet library regarding changes to the data exchange format and data submittals.

MFWP 453 reference records were added or updated in the fisheries library and submitted to the StreamNet Library.

ODFW Oregon StreamNet submitted 201 reference documents to the StreamNet Library this year related to data developed in WE 159. 171 were new to the StreamNet reference holdings, and ranged in years from 1996 - 2010; 104 of these new references related to hatchery facilities. A total of 100 documents were scanned that the Library had listed as a reference, but did not have a digital copy available. We also spent time quality checking references related to trends that will be updated in the Status of the Resource report (SOTR); some irregular references between trend IDs and current SOTR references were identified & corrected.

Region A variety of reports and publications were submitted to the StreamNet Library as they became available.

WDFW Changes made to the data were also made in the references, so copies of updated references were sent to the library. All new references associated with recent data exchanges have been delivered to the StreamNet Librarian. We created new memoranda to hold new data collected for natural spawner escapement and sent copies of the new references to the StreamNet Library.

Work Element: 160 Create/Manage/Maintain Database

Work Element: 160 Create/Manage/Maintain Database

Title: 1 **System administration**

Description: All StreamNet cooperators will manage and maintain the computer systems (hardware and software) necessary for acquiring, quality checking, formatting in regionally consistent format, georeferencing, backing up, and transmitting tabular and GIS data to the StreamNet database at PSMFC, and for storing, managing, documenting, backing up, quality checking and disseminating the data at PSMFC. This is a high priority work element that is essential to proper functioning of the project, even though it operates largely in the background.

Deliverable: The computer systems used to obtain, store, manage, back up, and distribute data (hardware and software) are maintained in functioning condition and updated as needed at PSMFC and the cooperating agencies.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

CRITFC	The computer systems at the Columbia River Inter-Tribal Fish Commission were maintained and software updated as necessary. Back ups were performed by the Information Technology/Operations staff at the Commission. Desktop systems were upgraded for the library staff to ensure inter-operability with the various programs used by the staff to maintain and track the library collections. In addition, the library staff worked on upgrading the library website at http://www.fishlib.org to align the design and functionality with the PSMFC StreamNet site (http://www.streamnet.org).
FWS	FWS personnel continue to support the infrastructure, both hardware and software, that makes it possible to perform StreamNet work.
IDFG	We implemented a new production and development server environment. Some of our servers were replaced by virtual servers. Standard computer system administration was completed.
MFWP	MFWP staff continued to test and refine the implementation of ArcGIS Server but were still unsuccessful. All other computers were maintained throughout the year.
ODFW	<p>Oregon StreamNet performed routine system maintenance and upgraded hardware and software as needed. We were able to successfully migrate to a virtual development and production server environments, and migrate the SQL Server users from 2000 to 2005 in both environments. We also installed .NET Framework 3.5 in both the development and production environments. All web application source code was checked into Visual VSN and Tortoise SVN to enhance source control in Subversion. One replacement laptop computer was purchased.</p> <p>ArcGIS server, ArcIMS and ArcSDE 9.3 were installed on our virtual servers, and map applications and geodatabases were migrated from the physical servers to the virtual servers. Permission, installation, and other lingering issues took significant time to resolve. The ArcIMS Site Contingency Plan document was updated to reflect the changes to the server configuration. Needed service packs were also installed as necessary to ensure proper functionality. We were able to establish hosting the GIS license server on the virtual servers using a keyless GIS license file. We also provided GIS license support to several dozen staff throughout the year, and initiated the process of coordinating agency GIS license deployments for the next Enterprise License Agreement between the state and ESRI. Preparatory testing was also started for the enterprise release of ArcGIS 10.</p> <p>Staff installed the Production Line Tool Set Map Production System Atlas software. This software facilitates the automated production of map sheets which will enable us to create the hundreds (possibly thousands) of maps necessary to represent the fish habitat distribution and barrier data in PDF format at an appropriate scale. The National Hydrography Dataset (NHD), Hydro Event Management (HEM) tools, version 2.2 was also installed, and event data creation on NHD with HEM tools was tested.</p>
Region	PSMFC StreamNet maintained an externally accessible copy of the StreamNet database on a server for data compilers and GIS technicians to compare their own data against, and installed database tools to keep this external database in synch with other internal databases. The primary database server had its warranty extended while having its bios and system drivers updated. System maintenance was monitored and daily, weekly and monthly backups of data were made. Likewise, the primary GIS map and spatial database servers were maintained and GIS software was upgraded to the latest version. The regional GIS servers now operate in a virtual server environment with failover protection.
WDFW	Over the course of the year, all StreamNet data has been backed up and all software patches installed and upgrades made. The StreamNet data manager requested and received a new computer to help with data base design and GIS data. The data manager also acquired SQL Server 2008 Management Studio. This will help facilitate the moving of all databases from many Access databases to one location. HyperTerminal was also purchased and installed to facilitate PIT Tag download and uploads. Finally, WDFW purchased Pendragon Forms to create data collection forms on handheld computers, as yet to be acquired as part of the ISTM grant. The handheld data loggers will capture Sport, Commercial, Natural Spawn, Smolt and Adult trap data with downloads to databases being created and will benefit StreamNet data flow and compilation as well as many other efforts.

Title: 2 Application and interface development

Description: All StreamNet cooperators will develop and maintain computer applications and interfaces that facilitate the entry, management and dissemination of tabular and GIS data at the regional and subcontracting agency levels. This will include development of new applications and tools as well as maintenance or modification of existing applications. To the degree possible, cooperators will share code and applications between agencies and with other data source agencies to maximize project efficiency.

Deliverable: The databases, computer applications and interfaces necessary for obtaining, storing, managing and disseminating data are developed and maintained in such a way that they support accomplishment of project goals.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

CRITFC The library has been working on aligning its website with the PSMFC StreamNet’s website’s look and feel. We will continue to work on tweaking the site in FY2011 as some of the changes are incompatible with our systems.

In FY2010, we joined the Oregon Libraries Network, L-Net, to begin offering formalized chat reference service and to participate in the service to increase our public visibility. We have been receiving questions and distributing information via this network to researchers, the general public, students and other librarians.

FWS We enhanced QA/QC in several StreamNet related programs, and eliminated several minor bugs.

IDFG A new version of the Spawning Ground Survey database and data entry application was completed and deployed. It is currently being used by IDFG, Nez Perce Tribe and Shoshone-Bannock Tribes to enter their 2010 spawning ground survey data. An updated version of the IDFG stream survey data entry application was deployed. Hatchery return data were entered into the Hatchery database. Both the Spawning Ground Survey and Hatchery databases will be used to update the StreamNet database in FY 2011.

MFWP Meetings between MFWP StreamNet staff and FWP Application Development and Fisheries Bureau staff were held to discuss the centralized database and to develop some preliminary data table structure and design. Field data entry tools were researched and evaluated by a group which consists of a StreamNet staff member. Staff attended a Fish Managers Meeting where the lake survey system from North Dakota was demonstrated. Field data entry tools continue to be evaluated.

ODFW Application and interface development and maintenance efforts this year included the completion of an online application that allows agency biologists to report the existence of and data handling approaches for ODFW field data collection efforts. Development of an application to facilitate change requests to the Fish Passage Barrier data continued this year. It may ultimately take a GIS application developer specialist to create the application that’s envisioned. Implementation of the AJAX (asynchronous JavaScript and XML) framework within the NRIMP framework occurred this year and migration of many web applications to the new framework was completed.

All records in the Metadata Warehouse website were moved to the ODFW Data Clearinghouse (DC) website in order to consolidate similar information into one location, and the DC was converted from .NET Framework 1.1 to 3.5. Effort was also made this year to clean up problem records in the DC. We contacted approximately 150 DC record owners to request they review and update their posted datasets. Attempts to contact 48 other record owners were returned unsuccessfully. We continue to pursue replacement owners for these orphaned records.

GIS staff updated the ODFW GIS Data Explorer ArcIMS map application by incorporating proper symbolization of the new Fish Passage Barrier Standard dataset, increasing the search tolerance to make it easier to identify point features, added statewide unique ID to the attributes that are returned by the Identify tool, and added Oregon Dept. of Forestry Fish Presence datasets to the application. We also replaced 2 meter, 1995 black and white ortho imagery with 2005 1/2 meter color imagery (county-based).

The data structure and user interface for Oregon’s Trend database was cleaned up by deleting obsolete tables and queries, adding the ODFW LocMaster table, updating the Trend form, and adding metadata. We also created a Data Contacts database and a Reference database to better track the data collectors contacted and references used for StreamNet data as well as multiple other projects.

We evaluated several products throughout the year to assess their ability to automate data flow, including SQL Server Reporting Services 2005, a product by Microsoft that allows the creation of new reports at runtime from practically any data source, and SQL Server Integration Services, which is a tool to transfer data between data sources and destinations. We also created a sample Species service that could be used to provide consistent species list access from a central location to all ODFW web applications.

Region Scoping progressed on the redesign of the StreamNet online data query with several design alternatives considered and explored. Application programming work will proceed through the end of 2010 and into 2011 with testing targeted by the end of Q2 FY2011. Design of the online data store submission tool was completed and will be tested and rolled out by the end of December 2010.

Internet mapping applications were maintained to present the latest data in our system using the latest version of ArcIMS (v10). An effort to re-tool the primary mapping applications and migrate from ArcIMS to ArcGIS Server was delayed by the workload associated with updating the regional hydrography to a higher resolution. Work on that re-tooling effort will continue into FY 2011 in association with the redesign of the Web Query System.

Regional staff consulted with MFWP personnel regarding how to code and design a user interface for biologists that will permit them to work with "Supercodes" (sampling locations that are composed of multiple component locations). They also discussed how to code portions of lentic water bodies such as the arms of a reservoir.

- WDFW WDFW StreamNet created a new Scales and Age data entry tool for the Columbia Rivers biologists to enter their Hatchery, Natural Spawn, Sport, and Commercial biological data. Queries and outputs were also created to help facilitate population modeling and run reconstruction. Additional data entry tools were developed for the Cedar Creek adult and smolt trap data.
- We conferred with William Meyer (WDFW biologist) and Yuki Reiss (USFS) to guide them in data management issues as they develop an internal data set for managing bullt rout survey data for the Upper Yakima basin.
- We commenced researching the best way to verify whether source data tied to a USFS LLID is equivalent to a MSH LLID. Although previous tasks converting 100K to MSH was the same kind of chore, internally WDFW drafted a tool (hydrodif) to compare hydrographies. Additionally, we began making links between our georeference system and the Wildlife Salmon Population Monitoring Unit (WSPE) new database (WSPE_Juv.mdb).
- Updates were made to the existing Age and Scales data base for data entry, including the collection of otoliths, PIT tags and fecundity data being collected at Hanford Reach. Queries and reports were also made to assist in data recovery and analysis. During this year, we created a Sport and Commercial database template to be used to download collected biological data from the data loggers into a database.
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Work Element: 160 Create/Manage/Maintain Database

Title: 3 **Data (content) management**

Description: The StreamNet project will manage data at the regional and subcontracting agency levels to assure timely and accurate data flow from source to final distribution. Activities include exchange of data to PSMFC, data loading, updating data, quality assurance procedures, metadata development, etc. Emphasis will increase on improving timeliness of data development and dissemination, and we will initiate work to develop metadata templates, by data type and over time in pilot subbasins.

Deliverable: Data are maintained and managed at PSMFC and the cooperating projects so that they are available through the StreamNet website and cooperating agency websites. A data delivery timeline application will be maintained on the StreamNet website. Work will have started on developing metadata templates. Metadata are published as Web Services.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

- CRITFC Data in the StreamNet Library is managed in the Koha Integrated Library Management System. 90% of the catalog records are shared through the OCLC WorldCat system to other libraries. The library metadata is maintained in MARCXML in the Koha system and is discoverable via Google and OAI harvesters.
- FWS We managed and maintained data throughout the fiscal year.
- IDFG Generalized fish distribution records for westslope cutthroat trout that overlapped with Montana and Oregon were updated in the StreamNet database. RefIDs for Idaho White Sturgeon were corrected. We updated trends EndFt to LocMaster LengthFt for 33 Chinook and steelhead trends. We conducted extensive in-season QA/QC of hatchery return and spawning data being compiled on a daily basis. We also continued to QA/QC the historic data in both the Spawning Ground Survey and Hatchery databases.
- MFWP Spatial data and metadata were maintained and updated where necessary.
- ODFW Routine effort was spent this year ensuring the data quality (correctness and consistency across the years of data availability) of Oregon's existing StreamNet Trend information. Ten percent of existing trends were randomly selected and a detailed quality check was performed during the update process. Staff coordinated with Regional StreamNet to confirm correctness and/or rectify discrepancies that were discovered during routine QA/QC processes. We also provided Regional staff with a table of current SOTR-related trends for coordination with CBFWA. Oregon staff spent a great deal of time correcting and updating issues with missing and/or changed LLID's, and missing or incorrect Begin and End feet for existing trends. Most of the errors were caused by stream location differences between the LocMaster_StreamNet table and the new LocMaster_Oregon table (related to our change to version 2 of the MSH). As a result of these issues, we combined all internal ODFW location data for streams, lakes / reservoirs, ports and bays / estuaries, and hatcheries into a single table that is now accessible to all program staff that support StreamNet data development, which ensures we are all using the same dataset. This dataset was also delivered to Regional StreamNet. A Data Management Plan was also completed for location data that are managed in support of the Oregon StreamNet project.

Time was also spent this year reviewing all 62 Columbia Basin adult population estimate trends (48 for Chinook, 12 for steelhead, 1 for Coho and 1 for Chum) to ensure the data actually represented population estimates. A few were found to have been incorrectly labeled.

With each data submission, we worked with Regional StreamNet staff to ensure exchange compliance. This included issues related to data on cross border streams, changes to Location ID's, some FishWayStatusID code inconsistencies, some barrier height discrepancies, missing Reference ID's, and also references that had not been submitted to the StreamNet library.

Staff participated in the StreamNet Reference Workgroup meeting where they identified the need to develop dynamic database naming guidelines. We researched and wrote up guidelines and examples for naming and titling non-standard references, like phone conversations, emails, and data sets (both static and dynamic).

The methodology we use to resolve duplicate barriers between disparate barrier datasets was refined throughout the year based on lessons learned as new data were integrated into Oregon's Barrier dataset. We also drafted a Fish Passage Barrier Data Management Plan that describes the workflow and stewardship for managing the Framework Fish Passage Barrier data. The document also includes operational standards, publication of information products, data access and future plans for the fish passage barrier data.

Metadata were created for the Willamette basin / Lower Columbia coastal cutthroat habitat distribution dataset.

Region This year's data efforts were dominated by a migration from 1:100,000 scale hydrography to mixed-scale hydrography that incorporates higher resolution streams which are named and/or have fishery data associated with them, primarily in Oregon but including multistate work in basins that include parts of Washington, Idaho and California. The master StreamNet location table increased in size by 39%, or 96,641 LocationIDs. This change required numerous changes to LocationIDs and the measures on streams that depict the beginning and end of reaches that represent particular data.

Over 5,300 observations were added to StreamNet count data tables, 2,550 new fish distribution records were added, 1,000 new records were added to the Reference table that identifies the source of data available from StreamNet, and 422 additional fish age composition records were added. On the other hand, after adding additional fish barrier records, the table ended the year with 7,143 fewer records due to the removal of many culvert type barriers on hillsides and ditches that were deemed to have no fish present or fish habitat beyond the barrier.

StreamNet technical employees who compile agency fish data, maintain the geographic referencing that allows StreamNet data to be accessed via maps and geographic criteria, and StreamNet Library personnel met four times during the project year to focus on creating better products and resolve issues that hinder timely exchange of high quality data.

Data integrity checks were conducted. When issues were detected the appropriate data source agencies were notified. For example, some dams that had been removed on the ground were found to still exist in the database.

WDFW WDFW StreamNet worked on a process to easily and continually update a routed layer for WDFW Stream Catalog Codes (CATIDS - a major historic and still current internal location code).

We also began integrating the data flow of the internal smolt trap location & attribute data, revised a tool to create a dictionary of the table contents of any MSAccess database, and began the process of integrating Regional staff's new StreamNet_X tool to continually reference the most current StreamNet data in our internal data sets.

All WDFW StreamNet data were merged into one master database to better track assigned codes and to avoid duplication. Updates to the master will be done quarterly.

In three steps, we successively resubmitted western Washington adult abundance data, corrected the georeference attributes, resubmitted supercodes, and revised the internal sub-setting that indicates which georeferences are completely ready for use. These products restored order after the upset created when supercodes were submitted but not absorbed fully in the StreamNet system. We also updated the spatial cross-reference tables used to submit eastern Washington adult abundance data.

We reviewed the internal HyrdoDif tool, which as purposely designed, catches very small differences. As such, the differences are too minute to be relevant to identifying full stream georeferences. Future work will test if the tool input can be revised in a way to catch just larger routing differences between the USFS LLIDs vs. WDFW LLIDs. For example, running the tool on a lower and upper half of each stream may yield comparisons that catch the occasions where the separate sources route the upper half of a stream differently.

Title: 4 Data exchange standard development

Description: The project will establish and maintain data exchange standards to ensure regionally consistent content and format of data that originate from multiple data sources. We will maintain adopted and develop proposed data exchange formats for data categories described under Work Element 159. This task will provide coordination and technical assistance regarding interpretation of database structures and codes. The formal process for creating new and revising old DEFs may require significant amounts of time, potentially more than a year, for complex data categories.

Deliverable: The formal Data Exchange Formats that are used to standardize data regionally are maintained and updated as needed. Additions and changes to the DEF are made in accordance with the DEF guidance document. At least one new updated DEF version is adopted during the year.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

CRITFC A technical subcommittee was formed for reference submissions. We have been tackling the pieces of the reference submission guidelines to make data exchanged for reference documents more consistent. The idea would be to make development of the requested data for reference documents as easy as possible for the reference compilers but still usable by the StreamNet Regional Librarian to identify and properly catalog the submissions.

Difficulties have included the identification of authors and agencies as well as differences in the identification of the title of a document. Library standards have been bent in developing some of the fields for these submissions and a return to those standards would be beneficial for outside libraries who may want to harvest our data. In addition, the variance in the application of these standards has led to some difficulties in aligning data between the submitting agency, PSMFC and the library catalog. By allowing data compilers to submit data in one form, the tables in the databases outside the library are not consistent with the data in the library catalog. These inconsistencies have been maintained rather than corrected when the library catalog records are developed with library standards. In FY2011, we will need to work on how to best address these differences and perhaps come up with a different data exchange standard for submitting the library catalog. A memo was developed to address this change, but has not been acted on as of the end of FY2010.

FWS We participated in a discussion of the current hatchery Returns DEF.

IDFG IDFG data coordinators participated in technical committee meetings. We proposed a new cross state distribution agreement. We supplied protocols and metadata for smolt trapping data. We also supplied protocols and metadata for compiling historical fish distributions from range wide assessments.

MFWP DEF version 2010.1 was reviewed and comments from MFWP were given via the forum, technical meetings and a conference call.

ODFW Oregon StreamNet staff participated in and contributed to discussions during technical committee meetings on DEF related issues. We participated in discussions and exercises regarding DEF modifications to the Trend table, the possibility of a "stream features" table that would decouple the spatial component from the dam, barriers, hatchery and other tables, presumed historical distribution, and mixed scale hydrography. Staff also spent time reviewing and commenting on the draft 2010.1 DEF upon its release.

Region The StreamNet Data Exchange Format was updated to version 2010.1. Major changes from the previous version included disentangling life history information from run of fish, and making all codes that link to lookup tables be required. This second item was done in preparation for updating the web query system so that the new query system could be easier to program and maintain, and faster in execution when using the system.

We also renamed the previous "Peak / other spawning counts" data category to "Spawner counts". This change allows us to avoid confusion caused by the name of the data category.

We assisted the data providing agencies with various questions that arose regarding the appropriate coding of data. These included:

- Discussing with WDFW personnel the fluvial / adfluvial codes used in the generalized fish distribution data category.
- How to capture repeat steelhead spawner information.
- Discussing with WDFW personnel the TrendType codes to use for bull trout redd counts.
- Discussing with WDFW personnel the codes used for life history types for non-anadromous fishes.
- Discussing hatchery authorization information with ODFW personnel.
- Discussing with IDFG personnel the expansion of counts for fish age data.

WDFW WDFW StreamNet staff attended the quarterly technician meeting to review DEF processes and make changes that assist the compiler in the collection of data for exchanges. Following technical meeting discussions, we created a forum for future DEF discussion about creating a point feature table.

Work Element: 161 Disseminate Raw & Summary Data and Results

Work Element: 161 Disseminate Raw & Summary Data and Results

Title: 1 **Develop and maintain Internet sites for data dissemination**

Description: StreamNet will continue to maintain and enhance the StreamNet Internet sites to provide access to tabular and GIS data from the StreamNet database. PSMFC will maintain and enhance the primary project website (www.streamnet.org) and associated applications, including the data query system, the interactive map applications and the Data Store. Partner agencies will assist with routine periodic review and comment on the primary website and may disseminate data through websites associated with their agency's StreamNet project and references housed in the StreamNet Library. Priority will be given to incorporating data and references developed through Work Element 159. The website will also be used to archive data sets developed by FWP participants for data that do not fit within the StreamNet DEF (Data Store archive function), including the means to index and search the archive. Metadata will be published as a web service, making all data findable through external portals.

Deliverable: Internet sites for the dissemination of data at PSMFC and the cooperating agencies are maintained and functional. New web pages and features are developed as necessary to maximize the availability and utility of data. Metadata are published as web services.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

CRITFC The CRITFC StreamNet staff contributed opinions and information as the latest PSMFC StreamNet website was developed and rolled out.

IDFG IDFG regularly used the StreamNet Web site and reviewed the new StreamNet web design.

MFWP The StreamNet website was used during the third quarter. An issue with querying fish distribution from multiple tables was forwarded to PSMFC.

ODFW Functionality-related feedback was provided to Regional StreamNet staff throughout the year.

All Oregon StreamNet websites were maintained and updated as needed throughout the year, including converting the NRIMP website from .NET framework 1.1 to 3.5. We continued to manage and maintain the Corvallis Research Lab's (CRL) website, where project results and reports of several major ODFW data collection projects are posted. This gives Oregon StreamNet immediate and direct access to datasets of interest to StreamNet. Eleven reports were added to the site this year. We also scanned a total of 99 reports to be posted on the CRL site.

Staff wrote a guide for updating the Information Reports citations on ODFW websites. As a result, we corrected the citation format and hyperlinks for 215 posted reports. We also sought papers and reports on fish genetics work within ODFW in order to more fully populate the NRIMP Data Resources page. Updated fish habitat distribution and fish passage barrier maps (4,377 pdf maps total) were posted to the NRIMP site. Image maps were also created for bull trout, chum and coho in order to facilitate "point and click" access to these maps. Finalized metadata for ODFW Boundaries and ODFW Facilities datasets were posted to the NRIMP Data Resources web page.

Conflicting priorities and time constraints again prevented us from establishing the ability to track and maintain web usage statistics. It's unknown if we will, or have a need to re-establish this functionality given our current workload and priorities.

Region The primary StreamNet website and online query system were maintained and updated as requested to fix errors and/or bugs. The systems were online and available 99.9% of the time. Work began to move the website and online data query system into the PSMFC virtual server environment to lower operating costs, improve availability, and provide for seamless redundancy.

Significant conceptual effort went into a potential redesign of the web query system. A variety of potential expanded functionalities and user interfaces were examined. The ability to query and display multi-member entities (sampling location descriptions that include multiple individual locations; time series that are composed of individual component time series; documentation that is composed of multiple documents). Unfortunately, significant down-sides to all scenarios left this effort unresolved at the end of the fiscal year. This effort will continue in FY2011.

Metadata describing StreamNet's spatial and tabular datasets were published as web services and are findable via both NBII (www.nbii.gov) and Geospatial One-Stop (www.geodata.gov).

Regional and CRITFC personnel met to discuss ideas for redesigning the StreamNet Library web site so that it resembles the main StreamNet web site. CRITFC personnel later implemented these changes. The Library web site now appears much more as a part of the StreamNet web site.

Various updates were made to the StreamNet web site, including adding a StreamNet calendar to the front page news, and adding a "what's new" page. News items were added to the news page as appropriate. Dead links were updated or deleted as necessary, and new links of interest were added to the "Related Links" page.

WDFW WDFW staff participated in both Steering Committee meetings and Technical Committee meetings and gave comment on the StreamNet Internet site and data extraction tools when needed.

Work Element: 161 Disseminate Raw & Summary Data and Results

Title: 2 Respond to data/information requests

Description: Receive and respond to requests for data, maps and other information; source materials; and custom data products at the regional and cooperating agency levels, as appropriate. Response to requests will be honored within the limits of available resources, with priority given to information requests having direct relevance to the Fish and Wildlife Program and data source agencies/departments. Other priorities will include implementation of the Endangered Species Act and federal, state, and tribal natural resource management activities. Custom data development will be dependent on available resources.

Deliverable: Requests for information or assistance are responded to in a timely manner (within one business day at PSMFC). If within StreamNet capabilities, requested help or information is provided as rapidly as reasonably possible within existing resources.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

All The StreamNet participants responded to a large number of requests for information and assistance during the fiscal year (Tables 5, 6 and 7). The number of requests made of the StreamNet Library doubled this year. PSMFC StreamNet continued to meet its stated goal of responding to all requests with one business day; for complex data requests, actual data delivery sometimes took longer to achieve. Several participants have pointed out that the increasing load of direct information requests is beginning to take significant time away from other primary duties in the Statement of Work.

Work Element: 161 Disseminate Raw & Summary Data and Results

Title: 3 Promote availability of StreamNet data and encourage participation in the project

Description: Participate in scientific, professional, and other relevant groups to increase awareness of the StreamNet project, inform others of the data and data related services available from the project, and to encourage participation by others in providing relevant data to the project.

Deliverable: The project and its data and services are made better known among potential data sources and data users, leading ultimately to increased participation in providing and using data.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

CRITFC Various activities throughout the year help to promote StreamNet and the StreamNet Library. We participated in fairs and festivals targeted to fish and fisheries. In addition, the library staff members served on committees and groups that provide information to other organizations. The Tribal Data Steward promoted the use of StreamNet to the CRITFC participant tribes.

The StreamNet Regional Librarian participated in professional organizations such as the International Association of Aquatic & Marine Science Libraries & Information Centers.

FWS Aspects of StreamNet as examples were mentioned in meetings with PTAGGIS and RMIS personnel.

IDFG IDFG StreamNet did not specifically participate in outreach activities this year.

MFWP StreamNet staff attended the Fisheries Bureau meeting and presented a crucial areas presentation; a fish managers meeting and MT AFS meeting where a Crucial Areas presentation was given and the Intermountain GIS Conference meeting where a Crucial Areas presentation was given.

ODFW Oregon's Decision Support System development and GIS training were the major emphases for outreach and presentations this year, promoting StreamNet's data layers, products and services. Oregon StreamNet staff gave several presentations this year, including presenting Oregon's plans to develop a Decision Support System, the need to improve the way ODFW manages its data, and StreamNet's data layers, products and services at three fish biologist meetings. Staff attended the NW GIS User Conference networking with peers regarding SN data and technology, among other topics. We also promoted StreamNet data layers, products and services at the Oregon Conservation Strategy technical meeting on wildlife connectivity.

We prepared and presented an Aquatic GIS Data Development workshop to four fish biologists in Camp Sherman. Relevant training such as this greatly promotes and enhances StreamNet's ability to acquire useful and usable data from field staff.

Region Regional staff participated in and gave presentations and posters at the Oregon Chapter AFS meeting, including presentations on the Protected Areas and new technologies for capturing data in electronic form at the field level. We also gave presentations at

the Western Division AFS and the Organization of Fish and Wildlife Information Managers, including presentations on the new online capabilities of the StreamNet website for uploading data sets to the Data Store and the progress being made in the Pacific Northwest in regard to the Coordinated Assessments through collaboration with CBFWA and PNAMP.

Staff also participated in the Pacific Northwest Hydrography Framework, a working group with a strategic vision for the stewardship and use of a common hydrography dataset among cooperating agencies and stakeholders in Oregon and Washington. StreamNet's involvement in this forum increases awareness of the project and its offerings while contributing towards stewardship of the nation's base hydrography layer (the National Hydrography Dataset). Two issues of the StreamNet newsletter were distributed this fiscal year on October 30, 2009 and May 28, 2010.

WDFW WDFW StreamNet staff attended the annual meeting of the EPA data exchange Network data providers in Chicago this year. Strong parallels exist between a juvenile migrant data exchange project and work being done in the Columbia River Valley to set up an information exchange for VSP indicator coordinated assessments. StreamNet was mentioned as a possible facilitator for elements of this exchange network.

Work Element: 161 Disseminate Raw & Summary Data and Results

Title: 4 Provide access to library services

Description: Receive and respond to requests for information and/or documents. Response to requests will be honored within the limits of available resources and technology. Priority is given to those requests with direct relevance to the Fish and Wildlife Program and StreamNet participants and cooperators. Other priorities will include implementation of the Endangered Species Act and federal, state, tribal, and local natural resource management activities.

Deliverable: Requests for information or assistance are responded to in a timely manner. Library assistance is provided as rapidly as reasonably possibly within existing resources.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

CRITFC The majority of library service requests are for information in documents and journal articles. Other library services used during FY2010 include the use of our microfilm/fiche scanner to view and print information for other agencies, the use of our audiovisual resources, including the video players and TV and the general use of our space for small meetings.

Work Element: 161 Disseminate Raw & Summary Data and Results

Title: 5 Provide access to library collections

Description: The StreamNet Library will provide customer access to the materials described in the collection development work element by providing facilities for storage of paper and electronic copies of documents, an online catalog of all documents in the collections, and staff to answer location questions and respond to requests. They will provide library services to the community as outlined in the library mission statement. They will network with other agency and regional libraries to provide better access to other collections that will enhance the StreamNet Library and to avoid unnecessary duplication of effort and materials.

Deliverable: The StreamNet Library is open to customers during regular business hours. Customers have full access to the collections, in physical and electronic formats. Other library services are provided through various contact points.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

CRITFC The library was open during regular business hours throughout the year. We also hosted a special event in March 2010 to promote the addition of the Audubon Society of Portland's Marshall Collection to our collections. We will be managing the Marshall Collection for the foreseeable future. This resource provides information on birds in the local area as well as other species of interest. The materials were gathered by David Marshall, retired biologist from the U.S.

Work Element: 189 Regional Coordination

Work Element: 189 Regional Coordination

Title: 1 Support regional efforts under the Fish and Wildlife Program

Description: Participate in planning, development and/or coordination meetings with regional projects and programs under the Fish and Wildlife Program to help develop a regional data management framework, to establish data type and data service priorities, and to provide advice in the area of data management, as requested. Provide input on ways StreamNet can effectively

contribute to the programs and general advice about data management. Participate in coordination groups (e.g., CBFWA, PNAMP, NWEIS), advisory groups, task forces, etc. whose purpose is to enhance the effectiveness of the Fish and Wildlife Program relative to its data development activities. This also includes planning for the next round of subbasin planning and related activities.

Deliverable: StreamNet staff have participated actively in and supported projects funded through the FWP, including CBFWA and PNAMP. StreamNet functions as a recognized component of the regional data management framework.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

CRITFC	The Project Leader served as an active participant in a number of activities under the Fish and Wildlife Program, along with NPCC staff, including the Coordinated Assessments effort.
IDFG	The IDFG StreamNet project manager monitored work by the PNAMP Data Management Leadership Team and coordinated assessments. We coordinated with IDFG staff on coordinated assessments and completed the Coordinated Assessments pilot.
MFWP	Staff participated in a WGA pilot project efforts which relate directly to the use of StreamNet data.
ODFW	Oregon StreamNet staff participated in a number of regularly scheduled PNAMP meetings, including Integrated Status and Trends Monitoring (ISTM), Fish Leadership and Metadata Workgroup meetings, contributing to shared discussions about data management-related activities, future directions, and funding options. The Oregon StreamNet Project Leader participated via conference call and WebEx in the BPA/NOAA/PNAMP Environmental Conservation and Restoration Project Implementation Tracking Workshop. Staff spent considerable time reviewing, commenting on, and coordinating with agency staff regarding the Collaborative Information Management to Support Ongoing Assessments of VSP, Hatchery, and Tributary Habitat Effectiveness for Columbia River Basin Anadromous Salmon (known as the Roadmap), which is a proposed data management strategy to support mandatory assessments. This effort also included attending several CBFWA Members Advisory Group meetings as well. We also responded to a request from the ODFW Columbia River Salmon Program Manager for a map that displays subsistence fishery areas as well as exclusion areas between Bonneville Dam and Beacon Rock.
Region	Regional staff were active in the Pacific Northwest Aquatic Monitoring Partnership (PNAMP) throughout the year, including the Steering Committee, the Data Management Leadership Team, the Effectiveness Monitoring work group and the Metadata work group. The Program Manager served on the PNAMP Steering Committee member and the DMLT. The Regional Fisheries Biologist participated in several aspects this fiscal year, including meetings to identify metadata needs and metadata collection strategies, and the project implementation and effectiveness monitoring workgroup. Several project staff participated in the Web Portals Workshop to discuss Internet-based data sharing among the various entities that collect aquatic resource data. A lot of effort was focused on the Collaborative Assessments, which are being conducted under leadership of CBFWA in partnership with PNAMP. Several years ago StreamNet regional personnel supported a survey of monitoring work conducted by PNAMP. This fiscal year we determined that this effort had formally ended. The web site and the data resulting from that effort were captured and transferred to PNAMP and deleted from the StreamNet servers at PSMFC.
WDFW	The Data Manager has had several meetings with ODFW (Salem Headquarters) to discuss data management of collected biological data within the region. Steps are being taken to purchase new hardware and software to store collected biological data and download to created databases. Additionally StreamNet staff members have participated in the BPA Coordinated Assessment VSP pilot project with members of PNAMP, CBFWA, CRITFC, ODFW and others. WDFW StreamNet staff have also been active participants in Puget Sound Partnership's regional efforts to create and populate indicator metrics for Puget Sound salmonid populations, as well as efforts by the Western Governor's Association to create a pilot Decision Support System for the Central Columbia High Plateau.

Work Element: 189 Regional Coordination

Title: 2 Coordinate with and support data source agencies

Description: Coordinate with state, tribal and federal fish and wildlife agencies/departments that develop data of interest to StreamNet's mission to streamline data capture, determine agency data management needs and work to improve their internal data management and data transfer to StreamNet. Demonstrate data management tools and applications developed by StreamNet and others to increase interest in and adoption of similar tools to improve data flow and automation. Support development of internal data management capabilities and data automation to the degree possible under existing funding, and attempt to link data tools to reporting and decision making. Encourage data sharing in exchange for help with data management.

Deliverable: Data capture and management tools demonstrated to agencies and regional groups. Increased involvement with tribes and development of plans to increase capture of tribal data. Increased commitment of agencies to increased data flow automation.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

CRITFC CRITFC assisted with the support on choosing a method of data entry for a project that potentially will involve the use of a new data entry technology for ODFW. This new technology involves the use of a Digital pen manufactured by ADAPX out of Seattle, WA. This new technology provides the user with both a paper written copy of a datasheet and a digitally transferred replica stored on the Digital pen and a computer. The digital pen uses OCR plus the use of a wordlist in selecting values transformed from the digital pen to a computer. ODFW StreamNet is thinking of using the digital pen for smolt data entry and estimation of commercial catch. We provided technical documents and user knowledge of some pitfalls to avoid and how to ensure success using this new technology.

In addition to the mentioned above support, CRITFC developed prototype applications of the digital pen for its member tribes. We provided a PowerPoint presentation documenting the use and success of using the Digital pen technology to the StreamNet Steering Committee.

IDFG IDFG StreamNet staff members coordinated with the Nez Perce Tribe and Shoshone-Bannock Tribes on hatchery and spawning ground databases. We compiled, queried, and proofed tables and charts necessary for the 2001-2009 spawning ground report.

MFWP A meeting between MFWP, USFWS, USFS, and BLM regarding bull trout data was held in the third quarter. The result should be more data of a high quality flowing into MFWP and onto StreamNet. Weekly development meetings for the centralized data system are being held.

ODFW Oregon StreamNet staff coordinated with Oregon Dept. of Transportation (ODOT) staff to evaluate similarities and differences between the ODFW Barrier database and ODOT's Drainage Facility Mgt. System database. It was agreed that ODOT should be the originator for fish passage barrier records associated with state highways, but ODFW would be responsible for populating the fish passage status information.

Efforts to obtain funding to increase Oregon's barrier information were successful this year; as a result work continued at a high level this year. Funds were obtained from the Dept. of Administrative services, the Oregon Watershed Enhancement Board (OWEB) and ODOT to migrate ODFW and other barrier information into the Oregon Fish Passage Barrier Data Standard (OFPBDS). We coordinated with OWEB, the Institute of Natural Resources and OSU Oregon Explorer Project staff to find short and long-term solutions for reconciling their Oregon Watershed Restoration Inventory (OWRI) database with the OFPBDS database. The most significant outcome was a recommendation that the OWRI schema be modified in a variety of ways to be more compatible with the OFPBDS. The Oregon Framework Bioscience Fish Passage Barrier Data Standard Workgroup met and agreed to a number of revisions to the OFPBDS. We also worked with ODFW's Aquatic Inventory Project (AIP) on a methodology for incorporating habitat unit level data into the OFPBDS. This work allows Oregon to submit a more complete and consistent statewide barrier dataset in the most recent hydrography to the StreamNet database.

We convened the Oregon Framework Fish Habitat Distribution Data Standard workgroup and discussed changing the scope of the standard to include historical distribution. Other changes that were discussed included some schema and domain changes as well as how to address the transition from the regional Framework Hydrography dataset to the National Hydrography Dataset (NHD).

Oregon StreamNet staff worked with the Department of State Lands and ODFW field and management staff to provide the best information possible for updating Oregon's Essential Salmonid Habitat (ESH) designations. We ended up adding an "Essential Salmonid Habitat" field to the fish habitat distribution database and populated it for all species / usetypes that meet the criteria of state or federally listed, spawning or rearing habitat. Revised metadata and posted updated datasets to the web server.

Staff members continued to chair and participate in the ODFW GIS Coordination Group, including participation in several Group and Subgroup meetings. Effort this year focus on developing and finalizing agency Location and Metadata standards, inventorying critical agency GIS assets, and producing quarterly GIS Newsletters for agency staff. Oregon StreamNet staff wrote articles or documents on a couple of newsletter topics; the Enterprise License Agreement (ELA) and data access guidance.

Considerable time was also spent coordinating the agency's effort to develop a Decision Support System. Creating a development plan, numerous meetings, presentations, pursuing funding, budget development, and staffing were just a few of the activities associated from this effort. This effort is expected to take several years to complete. In order to be successful, this effort will require improved ODFW data management, which will directly benefit StreamNet's access to quality information. Another task that took considerable time was managing the software license configuration and cost-sharing under the ELA and coordinating the agency's ELA renewal.

Other internal coordination activities related to: tying Oregon's hatchery release data to specific locations; scoping the requirements that the ODFW Passage Program has for the ODFW Barrier database and considerations for the database redesign; scoping a new web application for the STEP Advisory Committee grant application process; devising a plan to index documents, slides, video tapes and pictures, and somehow archive and make accessible those that are necessary to retain; participating in a break-out session during the Fish Division All-Staff meeting on data management where the issues were described and solutions were proposed; piloting an effort to review the existing barrier inventory and workflows for updating the inventory as well as the creating a priority list for the two North Willamette fish districts. We also developed a plan and timeline for outreach to agency biologists regarding a renewed effort to identify top priority barriers as well as a broader review of the barrier data.

- Region As part of the Coordinated Assessments effort, we participated in several CBFWA Members Advisory Group Anadromous Managers meetings to discuss data sharing and various technical aspects of how to do so efficiently. Significant effort was put into developing Data Exchange Templates for the Coordinated Assessments that will be completed by the CBFWA member agencies and tribes.
- WDFW WDFW continued our efforts in cooperation with the Northwest Indian Fisheries Commission in the creation of a jointly managed Salmonid Juvenile Migrant Exchange database (JMX). Though actual build phases in this project have been delayed due to intra-contract modifications and staff reshuffling with some of our partner agencies, we anticipate commencing programming in the early part of FY 11. In the mean time, we have been compiling juvenile historical data for ultimate merger into this system when it is complete.
- Finally, WDFW engaging in talks with various tribes to make available HSRG supporting data in a more timely manner.

Work Element: 189 Regional Coordination

Title: 3 Coordinate with related activities outside of the FWP

Description: Maintain communications between StreamNet and other applicable regional, federal, tribal, private and state-level agencies and activities beyond the Council's Fish and Wildlife Program to identify means for collaboration on data capture and management. On request or as possible, work toward capture of data not currently being entered in StreamNet.

Deliverable: Coordination with fish and wildlife programs outside of the FWP on data issues and availability is conducted as possible or needed

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

- CRITFC The CRITFC Project Leader served as a member of the Pacific Salmon Commission Habitat and Restoration Technical Committee. This group will share habitat restoration knowledge and progress within the PSC area of interest (Mid Oregon through Southeast Alaska) and will advise the PSC Fund Committees on effective habitat restoration strategies.
- IDFG IDFG StreamNet staff members coordinated with the Nez Perce Tribe, Shoshone-Bannock Tribes, US Fish and Wildlife Service, Idaho Power Company and others on hatchery and spawning ground databases. The IDFG StreamNet project manager coordinated with the Western Governors Association Decision Support System effort. We provided training and technical support on the use of the Spawning Ground Survey and Hatchery databases.
- MFWP MFWP StreamNet Staff participated in discussions related to standardizing data processes and delivery as part of the Centralized Survey and Inventory database development. Alternative data entry tools are also being researched and evaluated.
- ODFW Oregon StreamNet staff continued coordination with staff from EcoTrust and ODFW Monitoring Program staff on EcoTrust's project to help ODFW discuss and document the data and data management needs of ODFW's Monitoring Program. Staff from EcoTrust developed and launched a data dissemination tool for Oregon's monitoring data. Oregon StreamNet staff continued to provide data and database consultation, and PSMFC may still be called upon to house the system on their server.

We met with Portland State University Center for Lakes and Reservoirs and the Oregon Water Resources Department representatives to discuss the state of the lakes and reservoirs spatial data for Oregon. They identified and discussed several issues including waterbody names, unique identifiers and the need to maintain an intermediate table to track collections of separate, but related waterbody features within the NHD. The NHD will be implementing a permanent feature ID which will enable the development and maintenance of this intermediate table for use within Oregon. In addition, we met with the Geospatial Enterprise Office Framework Coordinator to discuss dataset stewardship and specifically the development of a pilot stewardship plan for the fish passage barrier dataset.

Staff met with ODFW Realty & Budget staff and staff from the Department of State Lands to discuss the mineral registry/state lands inventory system being developed by Department of State Lands and Department of Administrative Services, respectively, as well as ODFW's internal process for meeting the data needs of these efforts. We also discussed what might be requested from NRIMP for additional dataset development.

- Region On other funding we worked on a coastal cutthroat trout project that has been ongoing for approximately 2 1/2 years. This project is part of an inter-agency effort to conduct a range-wide assessment of this subspecies. During this fiscal year the significant contributions to that project included reviewing a National Fish Habitat Action Plan for data sharing, and determining how and if our current efforts would fit with that model. These comments were sent to the NFHAP committee.

We participated in the Oregon Fish Passage Barrier data standard and the Oregon Fish Habitat Distribution data standard workgroups and provided feedback for updates to these state-wide standards. These standards and the resultant data sets are managed by StreamNet personnel within ODFW, and the data obtained from multiple entities in the state are later incorporated into the StreamNet database.

We shared a draft StreamNet organism observations database with the Xerces Society, which was compiling freshwater mussels data. This data structure is compatible for use with the Global Biodiversity Information Facility.

We also provided information to ODFW personnel regarding metadata needs for a NMFS-funded project they are conducting to capture salmon recovery action metadata.

WDFW WDFW StreamNet staff worked closely with Coleville Tribes (CCT) to integrate their data into StreamNet as well as update our internal fish distribution coverage as needed.

Work Element: 189 Regional Coordination

Title: 4 Support regional scale reporting on status and trends for HLI, BiOp, etc.

Description: Support the capture and organization of data needed to produce assessments of population status and trends, such as for the Status Of The Resource report (SOTR), other High Level Indicators (HLI) or BiOp related assessments. Participate with developers of these reports to understand needed raw data to create the indicators, and work with data source agencies to facilitate improved data flow to the reporting mechanisms. Develop data to support these efforts under WE 159.

Deliverable: StreamNet functions as an integral component of data flow to regional reporting of population status and trends.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

FWS We support the capture and organization of this data, although do not participate directly.

IDFG IDFG StreamNet coordinated with the IDFG CBFWA representatives on high level indicators and collaborative assessments. We completed the Coordinated Assessments pilot test of sharing data following the Data Exchange Template.

MFWP MFWP StreamNet was not involved with the efforts to obtain high level VSP Indicators under the Coordinated Assessments because the current focus of that effort is only on anadromous species.

ODFW In support of the Coordinated Assessment effort, we researched, evaluated, and selected the Eastside Deschutes River summer steelhead as a test population for this effort, which involved compiling ODFW and TRT population and GIS data. As an extra effort, we also did the same for Fifteenmile winter steelhead. We created various levels of analysis flow diagrams to illustrate how metrics were calculated and Data Exchange Templates for the natural spawner abundance and spawner to spawner ratio indicators for both populations. We also researched the origin of the data used to create aggregate smolt to adult return rate (SAR) for the Oregon Mid-Columbia Steelhead Recovery Plan.

Considerable focus was given to supporting CBFWA's Status of the Resource Report (SOTR) report, identifying trends represented in the 2008 SOTR that need to be updated for the new upcoming SOTR, and provided a table to Regional StreamNet staff for coordination with CBFWA staff. Updating of SOTR data summaries contained in the StreamNet data system continued throughout the year. Aside from compiling abundance information to populate SOTR datasets, Oregon StreamNet staff worked to identify irregular references between trend IDs and current SOTR references, reconcile StreamNet holdings with SOTR summaries, and review the newly updated SOTR report for accuracy.

We submitted a funding proposal to BPA for Integrated Status and Trends Monitoring data management support, which was approved and work started late in the year. This will result in additional monitoring and trend data available to StreamNet.

Region StreamNet worked extensively with CBFWA and PNAMP on the Coordinated Assessments effort. The intent is to assist the management agencies with sharing data on a regional scale to provide high level estimates of Natural Spawner Abundance, Smolt to Adult Ratios and Recruit per Spawner, all of which are components of the VSP model. These estimates would be used as primary Indicators when reporting progress on recovery and BiOp actions. StreamNet took a lead roll in developing the Data Exchange Template for this effort.

WDFW WDFW participated in several meetings of the PNAMP/ CBFWA working group to conduct Coordinated Assessments in the Columbia River basin. WDFW StreamNet staff members worked to compile actual historical data into the format suggested for the initial three pilot VSP indicator exchange data sets using our suggested pilot population: Wind River Steelhead. Strong involvement with this effort will continue into and throughout FY 2011.

Work Element: 119 Manage and Administer Projects

Work Element: 119 Manage and Administer Projects

Title: 1 Manage project activities

Description: Administer all aspects of the StreamNet project at the regional and cooperating agency levels, including oversight of budget, personnel (including training and staff development), work statement / budget preparation and implementation, coordination among participating agencies, and project guidance through active participation in steering committee work.

Deliverable: Project staff and budgets are effectively managed, work detailed in this SOW is accomplished, and required SOW/budget documents are prepared and submitted on schedule.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

- All All partner projects contributed to the overall guidance of the project through attendance at the quarterly meetings of the StreamNet Steering Committee. All participants provided ongoing supervision and development to their employees. All expenditures were tracked to assure accomplishment of the milestones in the Statement of Work within the amounts authorized in project budgets. Input was provided to development of the budget and annual Statement of Work for FY-2011, which was submitted on schedule. In addition to completing all of these routine activities, a few additional actions were performed as follows:
- CRITFC Creation of the tribal data program under the Accords provided additional capabilities that will enhance data flow and ultimately lead to additional data being available through StreamNet.
- MFWP Montana StreamNet participated fully in the Steering Committee, but did so by phone in April due to the strong focus only on anadromous fish data issues.
- ODFW ODFW StreamNet replaced both Data Technicians who moved on during the year, and acquired another for Oregon Plan support which focused on datasets that support Recovery Plans (which includes VSP parameters). We were also able to hire two Barrier & Distribution GIS Analysts using some StreamNet funds, but mostly on other funding. We continue to lack the resources to fill the second vacant developer position. The process of filling ODFW's Conservation Strategy GIS Analyst was also completed this fiscal year. And, staff cross-trained in the field to gain knowledge of field techniques; participated in online technological, computer, GIS, and mandatory agency training; and attended seminars and conferences to learn about new technologies and for networking.
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Work Element: 132 Produce Annual Report

Work Element: 132 Produce Annual Report

Title: 1 Annual report

Description: Produce a detailed Annual Report for FY-08 project activities within 60 days of the end of the fiscal year.

Deliverable: The FY-09 annual report is submitted to BPA and uploaded to Pisces.

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

All All project participants contributed to the content of the FY-2009 Annual Report.

Region The FY-2009 Annual Report was prepared and submitted in the first Quarter.

Work Element: 185 Produce Pisces Status Report

Work Element: 185 Produce Pisces Status Report

Title: 1 Quarterly reports

Description: Submit Status Report through Pisces within 15 days of the end of each quarter.

Deliverable: Quarterly Status Reports are submitted on schedule

Project Accomplishments During Fiscal Year 2010, summarized by Work Element Title

CRITFC The StreamNet Library's contract under the Columbia Basin Accords was set for monthly reports in order to keep current with library activities. These reports were usually submitted by the 7th of the following month.

Others All project participants other than CRITFC contributed to the quarterly Status Reports, which were entered in Pisces by the 15th of the first month of each quarter, except for the fourth quarter, which was submitted on Sept. 30.

Appendix B

Work accomplished outside the Statement of Work

In addition to the work specifically identified in the FY-2010 Statement of Work, project participants also performed a number of task that contributed to the project but that were unplanned or opportunistic in nature or were performed on funding other than the StreamNet contract. Since these activities furthered project activities and data content, some of these activities are reported here.

Project Accomplishments Outside the Statement of Work Accomplished During Fiscal Year 2010

- CRITFC CRITFC StreamNet staff members participated in a number of efforts related to data of interest to StreamNet, including library professional groups and the habitat group under the Pacific Salmon Commission.
- IDFG StreamNet staff helped conduct Chinook salmon spawning ground surveys. The information collected is part of our core StreamNet data products.
- ODFW Non-Columbia fish distribution data were updated and/or maintained. Oregon's statewide distribution has now been migrated to the Oregon mixed scale hydrography (MSH) and the new StreamNet hydrography; they were submitted to Regional StreamNet and also made available via the NRIMP Internet page.

Significant effort went into expanding the non-Columbia portion of the ODFW Fish Passage Barrier dataset and converting those data and other data into the Oregon Fish Passage Barrier Data Standard format (OFPBDS). Version 1 of the OFPBDS dataset contains nearly 18,000 barrier features primarily from three sources: Oregon Department of Fish and Wildlife (ODFW), Oregon Department of Transportation (ODOT) and US Bureau of Land Management (BLM). Future editions of the dataset will contain barrier data from the Oregon Department of Forestry, Oregon Water Resources, soil and water conservation districts, watershed councils, tribes and other originators. Updated barrier data consistent with the regional hydrography were submitted to PSMFC StreamNet as a result of these efforts.

ODFW continued to support the database application designed to track Restoration and Enhancement Program funding applications through enhancements and fixes. We also continued support of the online Fish Screening and Passage Database, which was converted from .NET Framework 1.1 to 3.5 this year. Version 1 of an online application to modernize fish transportation and propagation permitting in the state was also maintained and enhanced this year. New development support this year focused on the Wildlife Habitat Conservation and Monitoring Program web application.

Oregon StreamNet staff support of the Comprehensive Wildlife Conservation Strategy (Conservation Strategy) continued throughout the year at a very low level, mainly focused on providing data development through GIS and analytical support until the new Strategy GIS Analyst was hired. Support of the ArcIMS web application Conservation Opportunity Areas (COA) Explorer (<http://nrimp.dfw.state.or.us/website/coexplorer>) continued as well. The site provides access to the Strategy's COAs, along with other relevant layers (e.g. habitat, vegetation).

Staff provided GIS training for 14 Marine Program staff in Newport.

We also coordinated with ODFW monitoring and evaluation staff and NOAA-Fisheries to pilot a data management effort centered on information that fulfills Recovery Planning data needs. This work was successfully completed and NOAA elected to continue to fund an expanded effort in the next fiscal year.

Wildlife Division GIS support continued throughout the year, including: filling general map requests; updating wildlife area maps; georeferencing winter range-related data and performing QA/QC on layer attributes; provided products related to energy siting activities; providing comments on functionality and tools related to wildlife applications; and creating and editing big game and game bird regulation, access and habitat, controlled hunt unit and travel management area layers and maps. GIS support for statewide linkages for wildlife movement continued this year.

Staff members continued to provide consultative support to ODFW's Wildlife and Information and Education Divisions regarding the Oregon Hunting Access Map (ORHAM) application, which was released for public use this fiscal year. This effort included discussions about long-term maintenance of the application.

GIS staff members once again were called on to create the maps used on Oregon's angling regulations. This effort involved working with managers and field biologists to correct errors and incorporate changes, helping to coordinate the printing process, and safeguarding image quality during the printer and website posting processes. The maps were also utilized in various alternative energy related efforts.

Region The Regional Fisheries Biologist spent significant time on other funding this fiscal year on a project funded by the U.S. Fish and Wildlife Service in California. The aim of this project is to develop a database and data entry, management, and analysis program for juvenile salmon outmigrants, with the goal being the estimation of smolt production from a stream system. While this project is aimed most specifically at rotary screw trap operations in the Central Valley of California, the database and programs are being designed for any type of sampling method used anywhere fish migrate downstream. It is anticipated that this project's products will be of value along the entire Pacific Coast and beyond, and should be of significant value within the Columbia River basin. The database was designed during this fiscal year, along with plans to create the programming interfaces for data capture and management and analysis. Those programs should be completed during FY2011.

The Regional Fisheries Biologist, on other funding, worked on a coastal cutthroat trout project that has been ongoing for approximately 2 1/2 years. This project is part of an inter-agency effort to conduct a range-wide assessment of this subspecies. During this fiscal year the significant contributions to that project included reviewing a National Fish Habitat Action plan for data sharing, and determining how and if our current efforts would fit with that model. These comments were sent to the NFHAP committee. Also for this project,

WDFW In addition to work carried out under the StreamNet SOW, WDFW StreamNet staff participated in ongoing efforts to compile Lower Columbia River historical data under the auspices of the Integrated Status and Trends Monitoring (ISTM) effort. Most notably during this period, our Lower Columbia staff members were able to compile historical data sets for age and scales, spawning ground surveys, and juvenile migrant (smolt) data. WDFW continued efforts to compile other statewide smolt data into our Juvenile Migrant Exchange database with help from a grant from EcoTrust.
