StreamNet Fiscal Year 2009 Annual Report

Period covered:
October 1, 2008 through September 30, 2009

StreamNet Project

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Executive Summary

Primary accomplishments for the StreamNet Project during Fiscal Year 2009 (FY-09) include routine update of the data in the StreamNet database, documentation of data sources in the StreamNet Library, maintenance of project data systems, assistance to regional data efforts, redesign of the project website, and reorganization of the project.

The project successfully reorganized to operate under two separate contracts. The previous StreamNet contract was reduced by the amount formerly provided by subcontract to the Columbia River InterTribal Fish Commission (CRITFC), and the CRITFC portions of the project, including operation of the StreamNet Library and specific data development and coordination efforts, were included in a separate contract between the Bonneville Power Administration (BPA) and CRITFC under the Columbia Basin Fish Accords. Actual function and management of the project, however, remained unchanged. CRITFC continued its active role in the StreamNet Steering Committee, and all routine project activities continued in a coordinated manner, including deposit of data source documents in the library. The Accords also provided means for CRITFC to increase data management activities with its member tribes which will significantly improve tribal data management capabilities and ultimately result in increased flow of tribal data to StreamNet and other regional entities.

The flow of specific data to the Columbia Basin Fish and Wildlife Authority for the Status of the Resource (SOTR) report remained a primary objective this year. StreamNet's partner projects in the fish and wildlife agencies made data updates for SOTR a priority, and the regional StreamNet office at Pacific States Marine Fisheries Commission (PSMFC) instituted an XML based web service designed to provide needed data directly to CBFWA. Unfortunately, CBFWA did not have time to implement the link on their end due to deadlines and changes to the report. We intend to work closely with them next year to implement automated data flow to help speed production of the report.

Efforts to develop internal database systems within the partner agencies continued. Part of the project's strategic vision (StreamNet Strategic Plan) is to speed data updates and be able to expand data coverage by automating the flow of data from field agencies to the StreamNet database. That is only possible where the agencies have agency wide data systems for each StreamNet data type. The Idaho Department of Fish and Game (IDFG) successfully transferred data to StreamNet from several components of its Idaho Fish and Wildlife Information System. Washington Department of Fish and Wildlife (WDFW) made significant progress in developing statewide data systems for spawning ground surveys, hatcheries and smolt trapping. Oregon Department of Fish and Wildlife (ODFW) neared completion of a data reporting system under a cooperative project with EcoTrust that may ultimately be housed with StreamNet. Montana Fish, Wildlife and Parks (MFWP) worked on an agency wide database needs assessment. These cooperative efforts, with varying support from StreamNet, will ultimately result in the means to improve the flow of data to StreamNet by speeding their conversion to the regionally consistent format in the StreamNet database format.

The StreamNet website, the primary means of disseminating standardized fish data from the StreamNet database, was redesigned this year. Users of the site are now able to access data and various StreamNet functions with fewer clicks. All primary functions were made directly available on the home page without the

need to dig deep into the website. This represents the first half of a plan to completely redesign the delivery of data. The next steps are underway and will include redesign of the data query system to improve usability and at the same time improve functionality, such as to add the ability to query data for multiple locations, species or data categories at the same time, as well as implementation of advanced mapping capabilities.

Routine ongoing updates of the standard data sets in StreamNet continued this year. The project was able to avoid losing data update capability in two states due to long term erosion of data technician positions by rescheduling unexpected savings from the previous year. Thus, WDFW was able to acquire data from eastern Washington and ODFW was able to acquire data from more subbasins than initially planned. Unfortunately, these staff deficiencies remain in FY-10. It is doubtful whether data transfer automation can be put in place quickly enough to avoid future gaps in data acquisition.

The project released a white paper entitled Considerations for Regional Data Collection, Sharing and Exchange. This data sharing guide was written in non-technical language to outline the steps needed for agencies to effectively share their data to support wider scale analysis and decision making and to articulate the roles various different entities need to play to make efficient and effective data sharing possible.

The StreamNet Project coordinated with a number of entities to facilitate improved data management. 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. Contacts were maintained with several species specific teams to support data management, including green sturgeon, lamprey, coastal cutthroat trout, mussels, and amphibians. 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 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. We look forward to working closely with regional entities as they determine their ongoing needs for field data to support population assessments, determination of High Level Indicators, and species recovery actions.

Introduction

This report describes work accomplished by the StreamNet Project, BPA Project Numbers 1988-108-04 and 2008-505-00, during Fiscal Year 2009 (FY-09) from October 1, 2008 through September 30, 2009. Details about the work done to accomplish the year's Milestones are summarized and reported at the Work Element level, as described in the 2009 Statement of Work. WE Titles and Milestones are described in the 2009 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. More detailed descriptions of the work accomplished this past year are presented by Work Element Title in Appendix A.

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). The project is administered by the Pacific States Marine Fisheries Commission (PSMFC). The majority of the project consists of sub-projects within the state fish and wildlife agencies (Idaho Fish and Game – IDFG, Montana Fish, Wildlife and Parks – MFWP, Oregon Dept. of Fish & Wildlife – ODFW, and Washington Dept. of Fish & Wildlife – WDFW), Columbia River Intertribal Fish Commission (CRITFC) and the US Fish and Wildlife Service (FWS) to acquire, georeference and standardize fish related data; develop databases within the respective agencies; facilitate data transfer regionally; and maintain a library of data references and fish and wildlife related reports and publications. The remainder consists of the regional staff at PSMFC to manage the regional database, disseminate regionally standardized data, provide regional data services and administer the project. Information about the project, fish related data, past reports and other documents are available at the project website at www.streamnet.org.

The StreamNet project continued to operate as a single project this year despite separation of the project into two separate contracts. The separation was the result of the Columbia Basin Fish Accords, under which a separate contract was developed for the CRITFC portion of the project, along with other CRITFC projects. The main StreamNet contract was reduced by the amount formerly subcontracted to CRITFC, but it otherwise remained unchanged. CRITFC continued to coordinate its work statement with the work statement for the remainder of the project, and continued its role in guiding the project through service on the StreamNet Steering Committee. The project continued to function as a collaborative effort, and will continue to do so. In addition, other portions of the Accords will strengthen the data management capabilities in CRITFC and its member tribes, and will ultimately result in an increased flow of tribal data.

Work priorities for FY-09 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 2009 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.

Work Element 159: Transfer/Consolidate Regionally Standardized Data

Data development activities during FY-09 focused on updates to the primary data types contained in the StreamNet database, with most of this work done by project staff in the partner agencies. Highest priority was given to data describing the abundance of the focal species addressed by the Status of the Resource (SOTR) report published annually by the Columbia Basin Fish and Wildlife Authority (CBFWA).

A significant issue encountered this year was that longstanding level funding has eroded the availability of staff time throughout the project, and in particular data technician staff in the WDFW and ODFW portions of the project, resulting in the inability to update data sets from all parts of the respective states. The impact of this limitation was overcome for this year by rescheduling unspent funds from FY-08 to this year, allowing routine data updates to continue. That solution, however, will not carry forward into subsequent project years.

CRITFC StreamNet project worked on updating the age data they have routinely provided. However, personnel changes in the project slowed work this year, and the data exchange was delayed until October, 2009. The Library received and cataloged referenced documenting the data added to the StreamNet database. A collection development policy was established to help guide building the various subjects in the collection. Through separate funding sources CRITFC staff began working with tribal members and other agencies to coordinate monitoring, evaluation, reporting, and data sharing efforts. A tribal Data Steward and Database Administrator have been hired, expanding data management activities. CRITFC will begin prototype data sharing projects with each member tribe in FY-10.

FWS StreamNet project successfully delivered its scheduled data updates for the national fish hatcheries.

IDFG StreamNet compiled data into its local databases for use in updating the StreamNet generalized fish distributions. Staff entered collector's permit reports, geo-referenced new stream survey locations, and linked the IDFG fish stocking database with the StreamNet hydrography. Also, 2008 IDFG redd count and carcass data were compiled and entered into the IDFG Spawning Ground Survey (SGS) database, part of the Idaho Fish and Wildlife Information System (IFWIS). Additional historic data were obtained and entered into the SGS, specifically 2001-2002 Clearwater Region spawning ground survey data and Nez Perce Tribe data for Lolo Creek, Newsome Creek, and the Selway River. Shoshone-Bannock Tribe redd count data for 2007-2008 were obtained and entered in the SGS. A query was conducted against the SGS database for the 2006-2008 index and non-index Chinook redd counts and these were submitted to PSMFC StreamNet. Subsequent editing in the SGS included correction of jack numbers and trap operation dates. Data not previously available in the IDFG hatchery data management system (HDMS) database or brood year reports were obtained and compiled into the HDMS. The HDMS was also queried and the 1982 - 2007 hatchery return data were extracted and submitted to PSMFC StreamNet. Hatchery facility information from non-IDFG hatcheries participating in the HDMS were obtained from the ODFW Lookingglass hatchery and the Nez Perce Tribe facilities and entered into the HDMS and submitted to PSMFC StreamNet. Forty eight new streams were added to the Idaho hydrography in order to georeference new stream surveys conducted by IDFG biologists but have not yet been exchanged with PSMFC.

IDFG was the lead agency on the 2009 westslope cutthroat trout status review, where distribution and barrier data were obtained. Once the final dataset is finalized, these data will be submitted to PSMFC StreamNet. Three references for fish distribution and hatchery facility data were submitted to the StreamNet Library, along with 2 references for redd counts and 1 reference for hatchery facilities. One other reference was updated. Official reference documents for white sturgeon distribution, Chinook harvest and hatchery returns were obtained and will replace the draft documents originally submitted to the StreamNet Library.

MFWP StreamNet made visits to each regional/field office with additional data collected over the year to complete the annual update. Data collection was intensified and several new data types were added to complete the Crucial Areas Assessment. In the future, these data types will be maintained in MFISH and updated annually. Over 10,200 fisheries distribution records were created or edited; over 7,000 fish survey records and 1,000 new survey locations were obtained; 900 barriers were edited or updated, primarily generated during the Westslope Cutthroat Trout Assessment; and over 200 genetic analysis results were added or updated. 85 restoration projects were added or updated and the Restoration Project user interface was enhanced to include direct access to a project location in the FWP internal Mapper. All data were exchanged with PSMFC StreamNet, some as independent datasets for the Data Store. Nearly 500 library entries were entered or updated during the year and the data and electronic references were exchanged with PSMFC StreamNet. In addition, we assisted the Idaho Fish and Game with the regional Westslope Cutthroat Trout Assessment by providing materials for and facilitating Montana assessment meetings. Montana was the lead on the Yellowstone Cutthroat Trout Assessment which was also conducted this year. A proposal to consolidate all trout assessment databases was reviewed and we also participated in the discussion of a regional Bull Trout Assessment. Cooperation and coordination between StreamNet regional staff, MFWP and NRIS regarding the 24k hydro continued, including a conference call between the NHD Working Group, NRIS and MFWP. After discussion at the regional StreamNet level, a meeting was planned with the NHD Staff in Montana and expanded to regional StreamNet staff, other StreamNet states, other Montana state agencies, and USGS with NRIS facilitating the 2-day discussion. A pilot project to integrate the NHD and LLID is being conducted by NRIS staff with assistance from MT StreamNet staff.

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 and marine harvest information, juvenile abundance, age, dam facility, hatchery return data, and 1,624 new, updated and/or corrected abundance trends. Twenty-six 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 9,153 spanning the years 1938 through 2009. 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. Version 2 of Oregon's mixed scale hydrography (MSH) was submitted this year.

PSMFC StreamNet generally does not perform the project's data acquisition and development, which is done primarily by project partners in the management agencies. PSMFC did continue to maintain and add data sets to the Data Store archive and submit reports and other documents to the StreamNet Library.

WDFW StreamNet performed a full rollup of WDFW hatchery returns data and submitted the data to PSMFC StreamNet. Forty-six Upper Columbia Basin trends were transferred and updated with 2008 data. Work began

on compiling Upper Columbia River Basin bull trout redd spawning data in conjunction with USFW and USFS. GIS staff moved our internal fish distribution line work to what was thought to be our final 24K hydrography yet work continues on the 24K. StreamNet Staff were successful in administering the level funded budget and operating in a manner to complete all work elements within those guidelines. This year, with additional funding for a data compiler, WDFW StreamNet staff has renewed efforts to compile Washington Eastside data from WDFW regional biologists as well as Yakama and Colville tribes. Staff compiled historical spawning ground survey data for Snake River and Walla Walla Basin Chinook, steelhead and bull trout from WDFW regional biologists. This effort resulted in 110 new trends. This data includes: spawning ground survey data in the Walla Walla River basin, Asotin Cr watershed & Columbia R. and Lower Yakima R for Chinook and steelhead.

Work Element 160, Create/Manage/Maintain Database

All project participants maintained, managed and updated as necessary the various databases and data systems that support the project, including hardware and software. The Data Exchange Format was revised only slightly during the year, with the updated version 2009.1 released. Significant progress was made in development of various internal database systems in partner agencies that are beginning to speed the conversion of data to the regionally standardized DEF. IDFG is now using a number of modules by data type and began direct exchange of data with the database at PSMFC. WDFW continued development of agency wide databases for spawning ground survey data, hatchery data, and smolt trap data. ODFW continued developing a collaborative effort with EcoTrust to build a spawning ground survey database to feed recovery planning. MFWP participated in an agency database needs assessment. Actions by the project partners are detailed below.

A significant new feature of the StreamNet data system was the deployment of an externally accessible copy of the main StreamNet database for use by agency data compilers. This copy, along with enhanced views and stored procedures, allows compilers to directly interact with the StreamNet database structure, validate their data against that structure, and identify any errors or inconsistencies prior to submitting data to PSMFC. This will speed the QA/QC and loading processes once data are submitted. In the future, further development will make it possible for compilers to enter data directly into this database, further speeding data flow and improving data quality.

CRITFC received most of its computer system support, except for the library, through other funding. CRITFC staff members are also converting internal databases to a more integrated SQL system. The StreamNet Library received several useful donations of hardware, including 500 GB and 2,250 GB hard drives and a new laser printer. The library also added an XML copy of its catalog, making it searchable via Internet search engines. The metadata were also maintained in OCLC (an international bibliographic cooperative), searchable via WorldCat.org, allowing the public to search holding of all OCLC members. An inventory of reference documents was initiated, to be completed in FY-10.

FWS worked to smooth data collection, processing and quality throughout the national fish hatcheries in the basin.

IDFG performed standard system administration tasks, including backups and software updates. Work to create a more secure extranet was performed that will allow more automated data exchanges with the StreamNet database. IDFG purchased IDFG StreamNet a new database server; software was installed and existing

production databases were migrated to the new server. A beta-test version of the new Spawning Ground Survey (SGS) database was completed and tested by several IDFG biologists. This fall it is planned that additional biologists will use it to enter their 2009 spawning ground survey data. Using non-StreamNet funds, a test version of the spawning module was used at several hatcheries during his past Chinook return season. Several bugs and changes were identified and are being worked on. Using non-StreamNet funds, a new version of the IDFG Standard Stream Survey (SSS) database was worked on; it will provide new features that should make data entry and reporting more efficient. One change of the SSS is that it will now be linked directly to the StreamNet hydrography layer so that whenever a new stream is added it will immediately show in the SSS application. A new hydro editing protocol was developed to speed the addition of streams, finally moving the editing process out of Workstation ArcINFO and completely into ArcGIS Desktop. IDFG StreamNet worked with IDFG personnel to develop better data management strategies and metadata requirements. Procedures were developed with IDFG biologists for entering, quality checking and submitting data to central databases. Quality checks were completed for the 2006-2008 hatchery return data, rectifying them with the associated brood year reports. Frequent checks and corrections were made to the generalized fish distribution, redd count, hatchery return and reference data sets. Working with PSMFC and Montana FWP personnel, some overlapping fish distribution records in StreamNet were fixed. Metadata for the Standard Stream Survey, Spawning Ground Survey, Juvenile Trapping and hatchery databases were compiled and updated. The IDFG StreamNet data manager participated in StreamNet Technical Committee meetings to resolve a number of data exchange format issues. A new SuperTrend data exchange format was designed, tested, and proposed to the technical committee.

In **MFWP**, numerous scoping meetings regarding a centralized fisheries data system occurred throughout the year with the Fisheries Bureau and application development staff. Database documentation and data flow diagrams were created for the scoping by StreamNet staff; progress was slow and the agency priority of this system appears to have slipped. An ODBC connection to a copy of the StreamNet database was made to facilitate additional QA/QC before data submission. The MFISH database underwent significant updates due to information collected in conjunction with the Crucial Areas Assessment. The MFISH database also underwent significant quality control.

ODFW StreamNet performed routine database maintenance and management throughout the year. Computer systems were upgraded and repaired as necessary. All applicable QA/QC routines on accumulated data sets were carried out. We operated this year using reduced server resources as we explored the option of switching to a virtual server environment. We've decided that is a viable option so we should be making the switch in FY-10. Application maintenance and development was limited due to the late hiring of a programmer and his time being occupied by lingering issues with non-StreamNet applications and data catch-up exercises. Modifications were made to Oregon's Trend database to more efficiently address SOTR data needs and edits prescribed by mixed scale hydro changes. We continued development and management of geodatabases to manage GIS data. And, we participated in SuperTrend DEF discussions and spent time reviewing the draft 2009.1 DEF upon its release. The need for a juvenile DEF continues.

PSMFC StreamNet performed all necessary database, hardware and software maintenance during the year. Data submissions from agency data compilers were quality checked, corrected as necessary with the compilers, and loaded into the main StreamNet database. A significant addition to the system was development of external access to a copy of the main StreamNet database and stored procedures, as mentioned above. This feature was

tested by data compilers in the partner agencies, and was received well. It has already allowed compilers to identify inconsistencies between their data and the StreamNet database, allowing problems to be corrected prior to data submission. Future development work will be directed at making it possible for data to be entered directly into the remote database, checked, and then uploaded directly into the main StreamNet database, further streamlining the process of making standardized data available in the StreamNet data query system. In routine management of the Data Exchange Format, adjustments were made and an updated version was released, including the ability to group related trends (SuperTrends).

WDFW StreamNet staff continued efforts to automate and streamline data compilation and reporting statewide. Among these efforts were the comprehensive georeferencing of existing data, new web funnel implementation, and upgrades of existing software systems. StreamNet staff continued efforts to automate and streamline data compilation and reporting statewide. Improvements this year involved an agency-wide migration from Microsoft XP to Vista, including updating software that was not compatible with Vista as well as a comprehensive data backup. Additionally, WDFW StreamNet staff researched the feasibility of and gained approval for using Google Earth or ArcGIS Explorer as a tool to quickly display location data to remote biologists to get confirmation or corrections on the points. WDFW StreamNet related desktop PC's were upgraded to ArcGIS 9.3 and supporting map software was installed. Finally, WDFW utilized StreamNet funds to purchase two new GPS units to replace end of life units.

WDFW StreamNet staff submitted updated barriers data, finalized the georeferences for the Eastern Washington natural spawner data, submitted new location codes (SuperCodes and point IDs) and prepared cross-references to support subsequent data submissions by the Eastern and Western Columbia data compilers. This location data supports barrier and adult abundance data.

Work Element 161, Disseminate Raw/Summary Data and Results

A completely redesigned StreamNet website (www.streamnet.org) was implemented this year. The home page was simplified and direct links were provided to the primary functions, decreasing the depth users need to go within the site to obtain data. This was the first step in redesigning the data query system to improve usability and increase functionality.

The StreamNet website remained the primary means of data dissemination for the project, with both tabular and map based interfaces to the data, an archive of data sets in native format (the Data Store) and ftp files. Metadata for StreamNet's data are published as web services, making them findable through clearing houses and portals. A web service in XML was maintained to feed data to CBFWA to automate updating the SOTR report. The regional project at PSMFC and the partner projects also responded to 3,317 direct requests for data, information, and assistance (Tables 1, 2 and 3) in addition to the data downloaded from the website.

Table 1. Information requests served in FY-2009, by StreamNet partner and by type of organization making the request.

Request from	Library	IDFG	MFWP	ODFW	WDFW	PSMFC
College/university	242	1	0	6	0	5
Government, federal	256	55	5	33	5	14
Government, state	243	102	52	222	16	8
Government, tribal/ Tribal organization	950	29	0	1	0	2
Government, county/local	34	0	0	6	2	2
Nonprofit	83	0	3	8	0	4
Industry / commercial	13	1	0	8	0	5
Private consultant	205	31	2	9	1	6
Regional entity	129	0	1	2	0	4
Watershed council/group	73	0	1	4	0	1
General public	228	0	1	10	0	5
Unknown	181	0	2	1	0	4
Total	2637	219	67	310	24	60

Table 2. Information requests served in FY-2009 by StreamNet partner and by type of request.

Request type	Library	IDFG	MFWP	ODFW	WDFW	PSMFC
Citing StreamNet / permission	0	0	0	0	0	1
Data request	0	23	21	11	15	8
General fish information	0	175	0	4	0	
GIS data / map	0	14	40	192	8	18
Hardware / software technical support	0	6	2	52	0	
Help finding information	412	0	1	16	1	13
Help with data interpretation / analysis	0	1	0	10	0	4
Help with data structure	0	0	0	8	0	3
Report error or problem	10	0	0	0	0	8
Library / documents	2215	0	1	3	0	1
Information outside StreamNet's scope	0	0	2	1	0	1
Other	0	0	0	13	0	3
Total	2637	219	67	310	24	60

Table 3. Outcome of information requests received in FY-2009 by StreamNet partners.

Outcome	Library	IDFG	MFWP	ODFW	WDFW	PSMFC
Could only refer to other	100	0	0	25	1	3
Request fully satisfied	2452	219	63	251	21	42
Request partially satisfied (may include referral to other source of info)	75	0	4	20	2	14
Could not help at all	10	0	0	12	0	1
Response pending	0	0	0	2	0	0
Total	2637	219	67	310	24	60

CRITFC continued maintenance of the StreamNet Library website (www.fishlib.org) to provide access to the library collection as well as maintaining regular business hours. Efforts continued to link digital documents to records in the catalog. The library also instituted use of Facebook and Twitter as a means of providing access to information, resulting in increased customer requests. Services provided to customers included locating data, filling requests, providing scanned or physical documents, and interlibrary loans. Staff also disseminated promotional materials and promoted library services at a number of professional and public meetings and events (details in Appendix A). Marketing efforts exceeded expectations and use statistics increased.

FWS spent considerable time making a hundred years of data available for on line distribution.

IDFG worked with PSMFC to identify and fix the download GIS data features on the StreamNet website. The IDFG StreamNet data manager found a break in a link from the USEPA Water Quality Standards Web site and the StreamNet Library Web site, which was fixed by PSMFC personnel. Of the information requests addressed this year (Tables 1, 2 and 3), requests for fish species distribution far outnumbered any other data category. Throughout the year, we worked with IDFG and partner biologists to explain both the role IDFG StreamNet has in helping their specific needs and the data that the StreamNet Web site has available. We also worked with many data requesters, often just pointing them directly to the StreamNet Web site. Many comments of surprise and pleasure were made about the wealth of information available there.

MFWP staff participated in review of the new StreamNet Web site. StreamNet data continues to be used and enhanced for the FWP Crucial Areas Assessment. StreamNet staff presented data and provided training on available resources at the Montana AFS meeting in Kalispell.

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 for new staff prevented us from tracking web usage statistics. We enhanced data access by providing tax lot data, watercourse data, fish presence and numerous other datasets to ODFW GIS users. Responses to requests for data and information (Tables 1, 2 and 3) represented a significant increase over last year. 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. GIS training and barrier work were the major emphases for the public outreach and presentations this year.

PSMFC StreamNet made significant improvements to the StreamNet website, which serves as the primary means of disseminating data from the StreamNet database. The website was completely redesigned to streamline its use by decreasing the number of steps required to access data. The layout was changed to make the primary functions directly accessible from the home page, and quick links to all parts of the website were made available on all subsequent pages. Transition to the new website went smoothly, with no complaints and several compliments. Use of the website shoed a distinct usage pattern of low use on weekends, much higher use during the week with peak usage usually on Wednesdays. The volume of direct inquiries and data requests has tapered off since the new website went live.

This year we began using new software to track website usage, moving from Webtrends to Google Analytics. The new software appeared to be much more precise in its analysis of site usage, and made logical sense as we compare its analysis with direct observations of how visitors are using the site. This year a total of 1,296 unique visitors conducted 2,639 query sessions on the StreamNet tabular data query, while 2,755 visitors conducted 5,267 sessions with the StreamNet map applications (Table 4). In addition, 6,983 visitors made 11,578 visits to the general site. Many different agencies and institutions used the StreamNet website during the year, with the largest segment being people using independent Internet Service Providers, making their actual identity impossible to determine. These statistics ignore web crawlers, robots and project staff.

Table 4. Top users of segments of the StreamNet website, in decreasing order.

Tabular Query	#		Mappers	#		General	#
Int. Service Providers (Comcast, Verizon, etc.)	849		Int. Service Providers (Comcast, Verizon, etc.)	1,352		Int. Service Providers (Comcast, Verizon, etc.)	2,530
USAISC (USACE HQ)	76		USAISC (USACE HQ)	371		State of Oregon	594
U S Forest Service	76		State of Oregon	344		U S Forest Service	339
USDA Office of Operations	60		U S Forest Service	282		NOAA	306
State of Idaho	52		NOAA	204		USAISC (USACE HQ)	276
BPA	44		USDA Office of Oper.	204		WDFW	261
USFWS, IRM/BFO HQ	43		BPA	137		USDA Office of Oper.	201
BLM	37		USFWS, IRM/BFO HQ	132		USFWS, IRM/BFO HQ	185
Comcast Business Com.	34		BLM	68		BPA	150
U. of WA	30		HDR	52		State of Idaho	128
WDFW	23		King Co., WA	51		BLM	95
Environ. Sci. Assoc.	15		WA DOE	40		Outsource Tech., Inc.	80
Landau Associates	14		WDFW	37		U. of WA	70
OSU	14		Environ. Sci. Assoc.	36		WA School Inf.Proc.Coop.	65
HDR	12		W H Pacific	36		OSU	64
PCC	12		State of Idaho	33		HDR	61
State of Utah	12		PCC	32		PCC	60
WA DNR	12		Landau Associates	29		State of Montana	45
UC Santa Barbara	11		OSU	27		PSU	39
Teale Data Center	10		Parametrix	26		USGS	38
Terra Science inc	10		WA DOT	26		Environ. Sci. Assoc.	36

WDFW StreamNet staff continued to assist efforts to build statewide abundance and productivity metrics reporting data systems in the interests of transparency and accountability. WDFW StreamNet staff responded to several data requests during the course of the year for primarily spawning ground survey and adult trapping data (Tables 1, 2 and 3). WDFW StreamNet staff also attended regional and national GIS meetings in Montana, Idaho, Portland and Colorado in which StreamNet related NHD coordination and stewardship were discussed.

Work Element 189, Regional Coordination

StreamNet partners coordinated with numerous entities during the year, both local and regional.

CRITFC staff members were involved in various coordination efforts internally, with the Fish and Wildlife Program, and on broader regional efforts. Internally, a Tribal Data Steward and a Database Administrator were hired to begin improving member-tribal data management capacity and practices. Staff consulted with BPA and NPCC staff to discuss ways to associate projects with limiting factors identified in subbasin plans and to capture updates to the data in subbasin plans as they are developed in FY-10. More broadly CRITFC participated in a series of meetings to coordinate and better standardize monitoring activities and methods. This involved both internal coordination with member tribes and external coordination with state and federal resource managers.

FWS StreamNet maintained coordination within FWS and the national fish hatcheries.

IDFG StreamNet worked closely with the ISEMP project on data exchange. We provided them database structures and data for several of the data types that they need. We also developed a data exchange protocol for future data updates. IDFG StreamNet continued its long relationship with the Idaho Supplementation Studies (ISS) project. ISS data now is fed directly into centralized databases which are harvested for data submissions to the StreamNet database. Good working relationships were initiated or continued among IDFG StreamNet, IDFG Fisheries, US Fish and Wildlife Service, Lower Snake River Compensation Plan, Nez Perce Tribe, Idaho Power Company and others relative to coordination on a number of database efforts, including the hatchery, spawning ground and streams survey databases. IDFG StreamNet has had several discussions with IDFG Fisheries regarding high level indicators. We support providing the data, but until the HLI program is finalized by the basin, IDFG StreamNet is in a waiting mode.

MFWP StreamNet staff coordinated with the Fisheries Bureau in a variety of ways over the year: contributing to a meeting regarding "common minimums" of fisheries data collection; providing data support to the scoping of a Fish and Wildlife Information System, scoping and reviewing the Crucial Areas Assessment, enhancing the Fishing Log, State Record Fish, and Fishing Regulation user interfaces and preparing a document addressing the perceived inefficiencies in fisheries data collection and submission. StreamNet staff and other state agencies met with the Statewide Restoration Coordinator to review Montana's needs and gain a status update. Data sharing coordination continued to occur with Glacier National Park and other federal partners. StreamNet staff and staff from the USFWS collaborated to create a common bull trout distribution map.

ODFW StreamNet was able to provide significant support to the Fish and Wildlife Program (FWP) through fulfilling a few large-scale requests for support. 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. Oregon StreamNet and ODFW executive staff attended the PNAMP/NED/PNW-RGIC Executive Data Summit, and reviewed and commented on data management recommendations.

PSMFC StreamNet maintained its coordination efforts with data providers and data users within the Columbia Basin. A data sharing guide was released that outlines the non-technical steps and the various roles that need to be performed in order to provide effective data sharing among entities. The guide was presented to the Northwest Power and Conservation Council, PNAMP, and several professional groups. The project continued active involvement in PNAMP, including serving on the Steering Committee, in the Data Management Leadership Team, and the Metadata, Effectiveness Monitoring and other work groups. Support for the Status of the Resource (SOTR) report by CBFWA continued during the year. XML schemas and a web service were developed to enable direct data flow to CBFWA as they develop the annual report. The project manager participated in the Executive Data Summit/NWEIS meeting in support of regional data management. Support for the Hatchery Scientific Review Group (HSRG) continued with installation of database and web servers to disseminate HSRG data. StreamNet metadata were maintained as web services to make project data findable through web portals, including NED, GOS and NBII.

WDFW worked with the Northwest Indian Fisheries Commission as well as Yakama and Colville Tribes to acquire, refine and package StreamNet bound data. WDFW also began efforts to collaborate with State of the Salmon / Ecotrust to compile historical data from the lower Columbia Basin.

Work Element 119, Manage and Administer Projects

All project partners participated in project administration through the Steering Committee and performed ongoing staff supervision and budget control. A significant change in administration was the removal of the Columbia River InterTribal Fish Commission (CRITFC) from the project contract into a separate contract under the Columbia Basin Fish Accords. Despite this change, the project continued to function as a coordinated group, with CRITFC remaining actively involved in the StreamNet Steering Committee and in coordinating milestones among all partners. This annual project report consolidates all actions performed under both contracts by all participants.

For **CRITFC**, FY-09 was the first year of funding the StreamNet Library and other CRITFC StreamNet milestones separately from the main StreamNet project under the Columbia Basin Fish Accords. This presented some operational and administrative questions initially, but these were resolved smoothly. This joint Annual Report demonstrates that the project continues to function as a single coordinated effort even though funded under two contracts.

The **IDFG** StreamNet project manager provided regular budget updates. Because of unexpected funds provided from another project, IDFG was able to return some StreamNet funds that were used by other StreamNet participants for data compilation. IDFG StreamNet staff also received appropriate supervision. The work described in the statement of work was accomplished and was reported in the required progress reports and submitted to PSMFC on time.

The **MFWP** StreamNet Program Manager attended all Steering Committee meeting in FY-09 and the StreamNet Data Manager participated in numerous technical committee conference calls. Staff meetings were held, performance appraisals for all employees were completed. A reorganization of the agency occurred and the StreamNet staff were made part of the Data Services Section within the Strategic Planning and Data Services Bureau of the Fish and Wildlife Division. This Bureau is one of 5 bureaus within the division including: Fisheries, Wildlife, Enforcement and Communications and Education.

ODFW StreamNet filled one of two long-standing vacant Application Developer positions this year, while the second Application Developer position remained vacant throughout the year due to lack of funding. Two Data Technicians were hired to help with the rescheduled tasks which led to a significant increase in SOTR support and data submitted to StreamNet.

PSMFC StreamNet continued overall project management, including hosting the four quarterly meetings of the Steering Committee and four meetings of the data technicians. Routine supervision and budget tracking were performed. The FY-10 work statement and budget were submitted to BPA on schedule.

WDFW StreamNet received two additional budget adjustments and through these was able to re-assign StreamNet staff to gather and compile new Washington WDFW originated data from eastern Washington as well as new data from the Colville tribe. Routine project administration, supervision and budget tracking were performed during the year.

Work Element 132, Produce (Annual) Progress Report

The FY-08 Annual Report was prepared with input from all project partners and submitted to BPA on schedule in the first quarter of the year.

Work Element 185, Produce Pisces Status Report

All required Status Reports, with input from all project partners, were submitted through Pisces as scheduled.

Work Done Outside of the Annual Statement of Work

During the year, project staff at PSMFC and in the partner agencies frequently performed additional work that was not specifically identified in the Statement of Work. In some cases there were opportunities to further StreamNet work that were not anticipated when the work statement was written. In quite a few cases, however, outside funding was used to support StreamNet staff time that wasn't covered under the StreamNet contract. Those efforts were primarily directed at work that would ultimately benefit the StreamNet project or its data, such as working to develop data outside the Columbia Basin or on developing applications that can ultimately be used by the project. Details of specific work accomplished outside of the annual Statement of Work is presented in Appendix B.

APPENDIX A
Detailed Accomplishments During Fiscal Year 2009

Following are details of the specific work accomplished by the participants in the StreamNet Project during FY-09, summarized among milestones to the Work Element Title level.

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 state StreamNet project to update the data categories listed in the other Data Development work element titles.

Project   Accomplishments During Fiscal Year 2009, summarized by Work Element Title

MFWP   The annual visits to each regional/field office to obtain data updates were made as planned this year. Additional data   were collected over the year to complete the annual update. In addition, several new data types were added to the data collection in order to complete the Crucial Areas Assessment. These data types will be maintained in MFISH and updated annually.

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. Efforts will be made to utilize the current mixed scale hydrography for these data, 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 2009, summarized by Work Element Title

IDFG   IDFG compiled collector's permit report data from a variety of sources, added georeferencing and added them to the IDFG stream survey database. These data will be used to update the Idaho resident fish distribution data. IDFG also georeferenced new stream survey locations for surveys conducted between 2007 and 2009. This georeferencing required correction to reported GPS coordinate data, including information on datum and projection. IDFG StreamNet also linked IDFG's fish stocking database with the StreamNet hydrography. These data will also be added to the StreamNet fish distribution data.

ODFW   Routine maintenance was performed as needed. We completed digitizing distribution data for the upper Deschutes basin where anadromous fish are expected to re-colonize upon completion of the passage project at the Pelton - Round Butte dam complex based on hardcopy maps and associated datasheets. Coho, steelhead and Chinook observations collected between 1999 and 2008 for the lower Columbia as well as coastal basins were acquired from the Western Oregon Rearing Program, and processing of these data continued through the end of year. We also acquired lower Columbia coho habitat observation data from the OASIS Project. Data quality issues were identified and provided back to OASIS before proceeding.

We obtained 355 lamprey observation records from NOAA's Scientific Take Permit database and where possible mapped the location information, reformatting it so that it can be converted into fish habitat distribution data. This resulted in 87 points and 102 linear records. Many observation records lacked the necessary information for accurate stream placement.

Anadromous fish distribution event measures were migrated from the Oregon mixed scale hydrography to the anticipated StreamNet mixed scale hydrography and submitted to PSMFC StreamNet.

WDFW   WDFW staff researched the differences between WDFW's various internal distribution files as a first step in creating a new ArcGIS based system. WFW GIS staff abandoned the old coverage system, transferring the existing internal fish distribution to an ArcGIS file geodatabase. While edits progressed on the internal hydrography, they tested the best process to convert the fish distribution to an edited hydrography. GIS staff moved the WDFW internal fish distribution line work to what was thought to be the final 24K hydrography, but work continues on the 24K. Discussion continues with the StreamNet Location Data Manager on how to insure the initial and continued nature of the event structure, although the final determinations won't be completed until the 24K hydro layer is resolved.

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 2009, summarized by Work Element Title

IDFG   IDFG compiled collector's permit reports data from a variety of sources, georeferenced the data and added them to the IDFG stream survey database. These data will be used to update the Idaho resident fish distribution. IDFG also georeferenced new stream survey locations for surveys conducted between 2007 and 2009. This georeferencing required corrections to reported GPS coordinate data, including information on datum and projection. IDFG StreamNet also linked IDFG's fish stocking database with the StreamNet hydrography. These data will also be added to the StreamNet fish distribution data.

MFWP   Over 10,000 Montana fisheries distribution records were created or edited during the Fiscal Year. Extensive verification of distribution occurred due to the Crucial Areas Assessment. In addition, MFWP StreamNet assisted the Idaho Fish and Game with the regional Westslope Cutthroat Assessment by providing materials for and facilitating Montana meetings and providing materials for Westslope Cutthroat Trout meetings in Idaho Falls. A proposal to consolidate all trout assessment databases was reviewed and the proposal was awarded. There was also discussion of a regional bull trout assessment.

ODFW   Lahontan Cutthroat trout habitat distribution data were migrated to the 24K Framework hydrography. Closed Basin redband habitat distribution data were integrated into the ODFW distribution schema in preparation for conversion to the Oregon Fish Habitat Distribution Data Standard. We converted resident species (bull trout, rainbow, redband, westslope and Lahontan Cutthroat) distribution data from the older ODFW format to the Oregon Fish Habitat Distribution Data Standard (OFHDDS), and initiated the process of converting all resident OFHDDS data to StreamNet format.

Oregon Dept. of Forestry fish presence datasets were obtained and appended to create single shapefiles for each ODFW Watershed District. This information may be useful as part of efforts to get ODFW District staff to formulate a professional opinion regarding the habitat distribution for coastal cutthroat trout.

Resident fish distribution event measures were migrated from the Oregon mixed scale hydrography to the anticipated StreamNet mixed scale hydrography and submitted to PSMFC StreamNet.

WDFW   Washington resident fish distribution underwent a comprehensive conversion and upgrade process, similar to the anadromous data. Project staff researched differences between WDFW's various internal files as a first step in creating a new ArcGIS based system. WDFW GIS staff abandoned the old coverage system, transferring the existing internal fish distribution to an ArcGIS geodatabase file. While edits progressed on the internal hydrography, they tested the best process to convert the fish distribution to the edited hydrography. GIS staff moved the internal fish distribution line work to what was thought to be the final 24K hydrography, but work continued on the 24K layer. Discussion continues with the StreamNet Location Data Manager on how to insure the initial and continued nature of the event structure even though it won't be resolved until the 24K is finalized.

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 (species of primary interest) 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.

Project   Accomplishments During Fiscal Year 2009, summarized by Work Element Title

IDFG   The 2008 IDFG redd and carcass data were compiled and entered into the IDFG Spawning Ground Survey (SGS) database. Agency personnel were contacted regarding errors in data recording. Additional data from past seasons were also found, specifically 2001-2002 Clearwater Region spawning ground survey data were entered into the SGS. Nez Perce Tribe data for Lolo Creek, Newsome Creek and the Selway River were also entered into the SGS. Shoshone-Bannock Tribe redd count data for 2007-2008 were obtained and entered into the SGS. Additional edits to the SGS were made. The SGS was queried for the 2006-2008 index and non-index Chinook redd counts and the data were submitted to PSMFC.

MFWP   Over 7,000 fish survey records and over 1,000 new survey locations were added or updated during the year. Data were submitted to PSMFC as an independent dataset.

ODFW   Data compilation, trend updates, & QA/QC efforts for adult abundance trends continued throughout the year, including data supporting focal species in the SOTR obtained in all subbasins. Emphasis was also given to compiling data from lightly represented data sources, such as Confederated Tribes of the Umatilla Indian Reservation and the Confederated Tribes of the Warm Springs. Updates were submitted to Regional StreamNet in April and September, as scheduled, amounting to 1,624 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 1949 to 2009. The year's work brings the total number of Oregon abundance trends to 9,153 spanning the years 1938 through 2009.

WDFW   The Vancouver Data Compiler worked on related adult abundance tasks such as creating a Region 5 Escapement goal table for the Lower Columbia tributaries, and updated chum streams that were peak counted only to estimate escapement numbers. Work continued updating Washington's Region 5's spawning ground survey data entry for 2007, as well as historical Coho data that was not entered previously.

The Olympia data compiler requested, received and compiled historical spawning ground survey data for Snake River and Walla Walla Basin Chinook, steelhead and bull trout, and Yakima Basin bull trout from WDFW regional biologists. This effort resulted in 110 new trends. Data were submitted to StreamNet on 3/31/09. Historical data for Tucannon fall Chinook were received too late to be included and will be submitted later.

This year, time was spent working on spawning ground survey data entry resulting in finishing the fall Chinook, coho, and steelhead 2007 & 2008 surveys. WDFW staff began entering survey data from 1997, as well as previously un-entered steelhead survey data. These sites were verified where new LLID's and river miles warranted.

The Vancouver Data Compiler spent much of the third quarter talking to biologists about 2008 natural spawn escapement data collection. He checked the WDFW SaSI website for data published on the web, and made numerous attempts at contacting biologists who have not sent data, then took the data that were received, created a reference, and entered that data into the Master Escapement database.

Forty-six Upper Columbia Basin trends were transferred and updated with 2008 data. Work began on compiling Upper Columbia River Basin bull trout redd spawning data in conjunction with USFW and USFS. Additional trends were noted for further research and addition to existing trends above McNary dam for steelhead, coho and Chinook. Yakima and Colville tribal biologists and data stewards were contacted and exploratory talks began regarding data exchange from both tribes. Work continued on identifying additional trends above McNary Dam for steelhead, coho and Chinook.

Representatives of Yakama Nation, CRITFIC and WDFW met and discussed data types and mechanisms for future data exchanges. It seemed the decision leaned toward CRITFIC submitting the data to StreamNet.

Bull trout data was formatted for exchange but are on hold pending the approval for release by USFS and USFW biologists.

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 2008. 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 DMFS 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 2009, summarized by Work Element Title

FWS   Available hatchery return information from National Fish Hatcheries were processed into the StreamNet DEF and submitted to PSMFC. A significant amount of time was spent dealing with data quality issues for this dataset in order to make it ready for access via the StreamNet query system. Multiple data exchanges were required this year.

IDFG   The total numbers of Jacks and trap operation dates in the SGS were quality checked and corrected where appropriate. Data not readily available in the IDFG hatchery return database or brood year reports were obtained and compiled into the hatchery return database. Chinook and steelhead hatchery returns for 1982 to 2007 were extracted from the hatchery database and submitted to PSMFC. Additional historic data were appended and quality checked in the IDFG hatchery returns database.

ODFW   Hatchery return data were updated through 2009 from all hatcheries where data were available. Of 169 trends, 55 are now updated through 2009, 43 through 2008, 21 are between 2000 and 2007, and 33 have updated information that ranges between 1948 and 1999, primarily because there was no new information. Oregon submitted 2,234 hatchery return records along with 6,070 disposition records. We also retrieved 1,924 egg-take records; however only 1,362 could be positively linked to existing return records, leaving 562 orphaned egg-take records and 310 return records without any egg-take information. Now that staff vacancies have been filled, efforts to refine the export process and acquire/match egg-take information will continue in FY-2010.

WDFW   Project staff began an effort to track each summarized StreamNet record to each specific original WDFW source record. The data manager rolled recent hatchery escapement estimates up with a link back to the original WDFW unrolled records. Also this year, the location data manager began building a better archive of historic georeferences to resolve confusion of format changes over time as well as store these data in one place. This action will aid the current (and any future) efforts to track each summarized StreamNet record to each specific original WDFW source record.

A full rollup of WDFW hatchery returns data was performed and submitted to PSMFC. These records are intended to replace all existing WDFW returns data at StreamNet headquarters.

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. This is a DMFS Priority 3 data type.

Deliverable Data on dam and fish passage facilities are maintained and updated by the state StreamNet sub-projects on a periodic, low priority basis. Updated data are exchanged with the main StreamNet database at PSMFC on a three year rotating basis, beginning in 2008.

Project   Accomplishments During Fiscal Year 2009, summarized by Work Element Title

All   FY-09 was an off cycle year for dam and fish passage data, so no work was planned. ODFW staff migrated 1,026 dam facility records to the StreamNet format and event locations to the anticipated StreamNet mixed scale hydrography and submitted the data to PSMFC.

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 anadromous and resident 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, beginning in 2007.

Project   Accomplishments During Fiscal Year 2009, summarized by Work Element Title

FWS   No work was scheduled for this data type this year. The Hatchery Facility database is the most stable of the data sets on file. No changes were required this year.

IDFG   No work was scheduled for this data type this year. Hatchery facility data from Oregon Dept. of Fish and Wildlife and the Nez Perce Tribe that are participating in the regional hatchery database were added. These included facilities for Lookingglass hatchery and Imnaha adult collection and acclimation facility. The StreamNet hatchery facilities database was updated with this information.

MFWP   No work was scheduled for this data type this year. Two hatchery records were updated and exchanged in September.

ODFW   No work was scheduled for this data type this year. However, facility data from ODFW's Hatchery Management Information System, StreamNet's Hatchery Facilities Table, and the local database were compared, revealing that there were 19 facilities in HMIS that were not in StreamNet. Locations for those facilities not in StreamNet were verified. Those that are applicable to StreamNet will be submitted in FY-10 when work on updating facility information updates are scheduled.

WDFW   No work was scheduled for this data type this year. The WDFW location data manager researched pre-existing StreamNet records for remaining unknown locations. These records were rectified and resubmitted in the March 31, 2009 submission.

Work Element: 159   Transfer/Consolidate/Regionally Standardize Data

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

Description   Maintain the regionally consistent routed hydrography layer at the 1:100,000 (100K) scale for which StreamNet is the official keeper. This LLID based hydrography has been the basis for georeferencing and displaying locations for all other data in the StreamNet database, and as such is an essential data set. In FY-09 we will continue to maintain these data, but emphasis has shifted to development and use of a mixed scale hydrography (100K plus 24K streams that have attached fish data) as a step toward the eventual conversion to 24K when a regionally consistent routed 24K hydrography becomes available from other entities (potentially several years away). 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 updated as needed for internal use and posted on the StreamNet website for use by others. An interim "mixed scale" (100K X 24K) hydrography for use in posting StreamNet data is developed for StreamNet use until the PNW 1:24,000 scale NHD is completed by USGS.

Project   Accomplishments During Fiscal Year 2009, summarized by Work Element Title

IDFG   At the request of IDFG biologists, 48 new streams were added to the Idaho hydrography. The IDFG Standard Stream Survey (SSS) database is directly linked to the hydrography and these additions were necessary so that new surveys could be added to the SSS. IDFG StreamNet uses the SSS as a data source to update Idaho's StreamNet fish distribution layers. These streams have not yet been submitted to PSMFC.

MFWP   Cooperation and coordination between StreamNet regional staff, MFWP and NRIS regarding the 24k hydro continued, including a conference call between the NHD Working Group, NRIS and MFWP. Regional hydrography stakeholders including StreamNet staff, MFWP, USGS, Montana NRIS and a contractor met for 2 days to discuss the high resolution NHD, current obstacles to implementation and to identify possible solutions. Regional stakeholders expressed their need for a whole-stream identifier to the USGS. A contractor hired by MT NRIS demonstrated a possible solution that consists of moving LLID's first to the medium scale NHD and then migrating them to the high resolution NHD. MT NRIS as the state stewards of the NHD decided to test the method in the 1701 major basin as a pilot project. The pilot project is currently ongoing with MT StreamNet staff in communication with NRIS staff to track progress.

ODFW   Routine maintenance was performed as needed and coordinated with Regional StreamNet staff throughout the year. We performed edits as necessary creating version 2 of the Oregon mixed scale hydrography (MSH). Many edits resulted from efforts to migrate and accurately represent existing distribution and barrier data onto the MSH. We continued to evaluate Oregon distribution and barrier data affected by the development of the regional MSH dataset. Numerous edits were identified during the process of distribution and barrier data migration to the 24k hydrography. Version 2 of Oregon's MSH was ultimately submitted this year. To allow integration with the regional MSH, we removed cross-border streams, projected the dataset to the regional StreamNet Lambert coordinate system, and built new routes with measures in feet.

Oregon StreamNet staff continued participation in efforts to develop a regional MSH. Coordination efforts included meeting with the Oregon Hydrography Framework Implementation Team. We worked with Regional StreamNet, WDFW, and IDFG to address border forming, mainstem Columbia and Snake River centerline differences, cross-state hydrography anomalies, and data integration. Additionally, we developed and tested a methodology for converting Oregon MSH event data to the regional MSH, and the maintenance of whole stream identifiers while aligning with the National Hydrologic Dataset.

WDFW   WDFW staff researched the differences between WDFW's various internal 24K hydrology files as a first step in creating a new ArcGIS based system. WDFW's internal 24K hydrology will be the basis for any additions deemed necessary for the mixed scale hydrography. In Quarter #2, WDFW GIS staff abandoned the old coverage system and transferred the tiled 24K hydrography into a statewide ArcGIS geodatabase. Any mixed scale hydrography line work within this 24K file was reviewed for errors and corrected using a mix of ArcGIS topology rules and other routines to find the errors.

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.

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.

Project   Accomplishments During Fiscal Year 2009, summarized by Work Element Title

IDFG   Barrier data was collected at the 2009 westslope cutthroat status review update workshops that were conducted range-wide. Those data are in process and not yet in final form or available. Once complete, they will be captured and submitted to StreamNet.

MFWP   Information for over 900 barriers was edited or updated during the year. The Westslope Cutthroat Trout Assessment generated many new barrier records and updated historic information.

ODFW   Tremendous effort was expended this year incorporating new barrier information into the ODFW barrier dataset and converting that data to the Framework and/or regional hydrography. We acquired and incorporated data from the Bureau of Land Management (BLM), the Oregon Department of Transportation (ODOT) and, to a limited extent, the Oregon Water Resources Department (Points of Diversion data), as well as remaining updates from ODFW District Biologists in the John Day and Umatilla / Walla Walla basins. We also completed digitizing fish passage barrier data for the upper Deschutes basin based on hardcopy maps and associated datasheets. 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 (8,023 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   The WDFW StreamNet data compiler and location manager updated the barriers dataset, submitting both 100K and MSH codes and measures. Additionally, barrier data was compiled for the Okanogan basin (the area of interest to the Colville Confederated Tribes). The data were pulled from a wide-variety of sources including documents provided by the Colville Tribe, WDFW's FPDSI dataset and WDOE's Water Right dataset: GWIS_SDEexport.gdb. These data were exchanged in the fourth quarter of 2009.

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 DMFS Priority 2 data type.
Deliverable   Data on age composition of returning adult fish is available through the StreamNet website.

Project	Accomplishments During Fiscal Year 2009, summarized by Work Element Title

CRITFC Work continued on age data, but due to personnel changes the fish age data were delayed for FY-09 and will be exchanged in October 2009.

FWS Available Age Composition information from National Fish Hatcheries was processed into the StreamNet DEF and sent to PSMFC. Much time was spent dealing with data quality issues for this dataset in order to make it ready for access via the StreamNet query system, and multiple data exchanges were required.

IDFG IDFG StreamNet submitted age composition data in FY-2008 which were extracted directly from the hatchery return database. IDFG fishery managers objected to using that particular source of data, so the data were removed from StreamNet. IDFG biologists prefer using a post-run mixture analysis method as the source of age composition data in StreamNet. IDFG personnel are working on pulling these data together. IDFG StreamNet staff assisted in quality checking the 2006-2008 mixture analysis data, but they were not available in FY-2009 for submittal to the regional StreamNet database.

ODFW Forty-one new ODFW age data records were compiled, entered and submitted to PSMFC StreamNet. RecordNo's for all age data submitted in FY-2008 were also updated and submitted.

WDFW The WDFW StreamNet data compiler completed outstanding updates from the FY-2008 age data exchange. WDFW also added a 'Record Number' data element to the Age table for ease of age data exchange. This element corresponds to the master Age Table at the Regional Office, thus simplifying QA/QC and synchronization and updating of these records.

Age data collection was completed for the Lower Columbia fall and spring Chinook tributaries and some chum tributaries. Data were compiled and entered into the Master Escapement database. These records were exchanged by the beginning of the third quarter. Age data for the Lower Columbia River hatcheries was completed and delivered through the 2007 return year.

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 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 2009, summarized by Work Element Title

CRITFC No new non-DEF data sets were developed in FY-09 due to staff and funding limitations.

IDFG IDFG researchers agreed to submit the Natural Production Monitoring project's stream survey data as an independent data set after the 2008 data is verified, although it was not completed by the end of the fiscal year. All of the range wide status assessments for cutthroat and bull trout were made available in the StreamNet Data Store.

MFWP Over 200 genetic analysis results were added or updated to Montana's database this year. 85 restoration projects were added or updated during the year, and the user interface was enhanced to include direct access to a project location in the FWP internal Mapper. Restoration project information was exchanged in DEF format while genetics data were submitted as an independent dataset to the Data Store.

ODFW No requests were received during this project period to post independent datasets from Oregon. Updates to data sets other than those previously mentioned were submitted along with other scheduled data exchanges, including 3 marine harvest trends and 17 updated/corrected juvenile abundance trends for the years 2003 - 2007. These were not called for in this year's SOW, but were obtained opportunistically and submitted. Because there is no current DEF for juvenile abundance data, these data were submitted with the escapement trend data. 296 freshwater/estuary harvest trends (1956 - 2008) were submitted, and an additional 284 trends were updated and will be submitted in FY-2010.

Region Seven new or updated data sets were received and added to the StreamNet Data Store. Two major data sets were the 2006 and 2008 Yellowstone cutthroat trout status assessments, along with their supporting data, GIS files, and associated reports. The

Montana salmonid genetic purity data set was updated. A Montana Fish, Wildlife & Parks fish population survey data set was added detailing general fish survey results from 1961 through 2008 from multiple agencies and scientific collection permit holders in Montana. In addition to adding new data sets, the Data Store was examined for broken links to Internet resources and fixed.

WDFW   No new data other than data types in the DEF were developed this year.

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 2009, summarized by Work Element Title

FWS   Two new references were added to the Library, entered in the Reference database, and sent to PSMFC.

IDFG   Official reference documents for white sturgeon distribution, Chinook harvest, and hatchery returns were obtained. They will replace the draft documents originally submitted to the StreamNet Library. Three references for fish distribution and hatchery facility data were submitted, along with 2 references for redd counts and 1 reference for hatchery facilities. One other reference was updated.

MFWP   Nearly 500 library entries were entered or updated during the year; data and electronic references related to survey and inventory data were exchanged with PSMFC StreamNet.

ODFW   Oregon StreamNet submitted 26 electronic reference documents to the StreamNet Library this year, related to data developed in WE 159. All were new to the StreamNet reference holdings, and ranged in years from 1983 - 2009.Region Several reports and documents were forwarded to the library for inclusion in the collection.

WDFW   The WDFW StreamNet data compilers delivered age data references to the library from the age data exchange. Additionally, they began the process of researching an unresolved RefID issue. The data manager eventually delivered reference PDF documents for escapement data to the StreamNet Library in the third quarter. A total of six new references was sent to the library in FY-2009.

Work Element: 159   Transfer/Consolidate/Regionally Standardize Data

Title: 13   Rescheduled Data Development - Washington

Description   Develop data in mid-Columbia subbasins in eastern Washington based on funds rescheduled from FY-08. Level funding in FY-08 resulted in decreased staffing that prevented work in these subbasins. Rescheduling of unspent funds within the StreamNet contract has allowed hiring additional data technician time in FY-09 to update data through 2008 in eastern Washington.

Deliverable   Updated fish abundance data are developed in the mid-Columbia subbasins in eastern Washington through and including 2008.

Project   Accomplishments During Fiscal Year 2009, summarized by Work Element Title

WDFW   Additional compilation work was completed and submitted for three new Eastern Washington datasets in the last quarter of FY-2009. These new data sets included:
* Annual spawning ground survey data in the Walla Walla River basin.
* Annual steelhead spawning ground survey data for Asotin Cr watershed.
* Development of Chinook spawning ground survey data for main stem Columbia R. and Lower Yakima R.

Work Element: 159   Transfer/Consolidate/Regionally Standardize Data

Title: 14   **Rescheduled Data Development - Oregon**

Description   Develop data in Oregon to update or obtain abundance data for focal species listed in the Status of the Resource report that is not included in the base FY-09 work statement. This work will be done using rescheduled funding from the FY-08 StreamNet contract and will allow acquisition of data in additional subbasins and/or for additional species in Oregon that otherwise would not be obtained due to decreased data technician staffing that resulted from level funding over time.

Deliverable   Fish abundance data in support of the SOTR are developed in Oregon subbasins and for species not originally covered in the FY-09 work statement.

Project   Accomplishments During Fiscal Year 2009, summarized by Work Element Title

ODFW   Rescheduled funding provided us an opportunity to pursue abundance data for subbasins and focal species in the SOTR that aren't yet available through StreamNet. Data searches were conducted for 6 SOTR focal species subbasin/species combinations; Imnaha summer steelhead, Umatilla bull trout, Walla Walla spring Chinook, Walla Walla summer steelhead, Willamette bull trout and Willamette Oregon chub. Data was found for Imnaha summer steelhead, Willamette Oregon Chub, and Willamette Bull Trout. Data for Imnaha summer steelhead have been submitted to PSMFC StreamNet. The Willamette Oregon chub data are sensitive and we have been asked to be conservative with the location information, and we still haven't figured out the best way to submit these data for inclusion in the StreamNet database. No recent data were found for Walla Walla spring Chinook (the species is now considered extirpated) or Walla Walla summer steelhead. A data request is still pending for Umatilla bull trout, in which recent data were cited as a "personal communication with Michele Weaver (ODFW)" in the USFWS Bull Trout Draft Recovery Plan. Older data were found for Willamette bull trout, but we are waiting for the most recent data before submitting them to PSMFC StreamNet. Hatchery return data were not scheduled but were included under this effort. Those data were located and submitted to PSMFC StreamNet.

This funding also provided opportunities to search for data to support SOTR focal species summaries with no supporting data. Data searches were conducted for 16 SOTR focal species subbasin/species combinations; Fifteenmile coastal cutthroat, rainbow trout, and Pacific lamprey; Hood River Pacific lamprey; Imnaha fall Chinook and Pacific lamprey; Willamette chum and coastal cutthroat; Burnt redband trout; Owyhee redband trout; Malheur spring Chinook and redband trout; and John Day redband trout and westslope cutthroat trout. Recent intensive survey data were found only for Malheur redband trout, and the data have been submitted to PSMFC StreamNet. Incidental, old or non-intensive survey data were located for Fifteenmile coastal cutthroat trout, Fifteenmile Pacific lamprey, Hood River Pacific lamprey, Willamette coastal cutthroat, Powder bull trout, John Day redband trout, and John Day westslope cutthroat. Data were collected for Owyhee redband trout in the Idaho portion of the subbasin, but not in Oregon. No data of any kind were located for Fifteenmile rainbow trout (although there is data on steelhead in the Fifteenmile subbasin), Imnaha Pacific lamprey, Burnt redband trout, or Powder redband trout. No data were located for Imnaha fall Chinook, Willamette chum, or Malheur spring Chinook because these species have either been extirpated from the subbasin or are considered functionally extinct.

The final focus for rescheduled funding targeted time series that are not used in the Status of the Resource Report that could not be updated with level funding. We located, updated and submitted Trout Creek (Deschutes) summer steelhead spawning survey data. We also located and updated harvest data for fall Chinook, Coho, and some summer and winter steelhead. For 8 non-focal species, we updated 48 freshwater harvest trends (Deschutes: Coho & Rainbow Trout, 4 Trends each; John Day: Fall Chinook & Coho, 8 & 2 Trends respectively; Sandy Summer Steelhead, 5 Trends; Walla Walla Fall Chinook & Coho, 1 Trend each; Willamette Summer Steelhead, 27 Trends) and 2 Willamette Summer Steelhead dam count trends. The harvest update spanned 1978 – 2007. These data will be submitted in FY-10.

Work Element: 159   Transfer/Consolidate/Regionally Standardize Data

Title: 15   **Library Collection Development**

Description   The StreamNet Library, with input from the other project participants, will develop a collection of materials applicable to the mission of StreamNet. We will collect, catalog and organize materials to document data sources, Fish and Wildlife Program activities and reports, and other gray literature for access by regional scientists, agencies, interested parties, and other libraries. The project participants and cooperators will submit reference documents for all data contained in the StreamNet database and Data Store to the StreamNet Library.

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

CRITFC   A collection development policy was refined this fiscal year to guide the development of the various subjects in the StreamNet Library. Materials received as part of the supporting documentation for the StreamNet data were not addressed in the policy as these materials generally fall within the main mission of the StreamNet Library to collect documents on the fish and wildlife of the Columbia River basin. They also support one of the primary missions of collecting the reference documents for StreamNet data. A spreadsheet detailing the summary of items amended, added to and deleted from the catalog was kept.

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 2009, summarized by Work Element Title

CRITFC   Computer systems involved in supporting the StreamNet mission were maintained and no major problems were encountered in FY-09. The StreamNet Library was the recipient of several donations of hardware, including a 500 GB hard drive, 2 250 GB hard drives and a new laser printer. Software for the library catalog was upgraded in February. Except for the Library system, all computer system support was provided by other funding.

FWS   USFWS computer specialists maintained and updated computer systems and equipment throughout the year.

IDFG   Standard system administration tasks were performed, including backups and software updates. Work to create a more secure extranet was performed that will help develop more automated data exchanges with PSMFC StreamNet. IDFG purchased IDFG StreamNet a new database server. Software was installed and existing production databases were migrated to the new server.

MFWP   Hardware and software were maintained throughout the year. An ODBC connection to a copy of the StreamNet database was made to facilitate additional QA/QC before data submission.

ODFW   Oregon StreamNet performed routine system maintenance and upgraded hardware and software, as needed. All application source code was moved into the Subversion 1.4.8 version control tool. Two replacement desktop computers were purchased. We eventually recovered from several hardware failures that occurred last year. We operated under a two-server structure throughout the year. We purchased three replacement servers but they were returned in favor of exploring the option of switching to a virtual server environment. Configuration and testing continued through the end of the project period.

GIS staff upgraded to ArcSDE 9.3.1. Permission issues and other lingering issues took significant time to resolve. Needed service packs were also installed as necessary to ensure proper functionality. We installed Visual Studio 2008 with the express purpose of enabling full functionality of the ArcGIS Server toolset. We also provided GIS license support to several dozen staff throughout the year.

While preparing an old non-StreamNet computer for surplussing, we discovered and retrieved some lamprey and whitefish distribution data as well as fish passage barrier data, Oregon Conservation Strategy data and some big game related data.

Region   StreamNet's database, web and spatial servers were monitored and maintained with the latest operating system and software updates, routine backups of important data were created, and procedures for start-up, shut-down and disaster recovery were developed. StreamNet participated in exploratory use of virtual servers at PSMFC, with good results.

WDFW   During the year, preparations were made for the agency mandated migration to Vista, including updating software that was not compatible with Vista and performing comprehensive data backup. WDFW StreamNet staff researched the feasibility of using

Google Earth or ArcGIS Explorer as a tool to quickly display location data to remote biologists to get confirmation or corrections on the points. Following a demonstration to a WDFW advisory group, users were approved to carry Google Earth on their PCs. Additionally, WDFW StreamNet related desktop PC's have had ArcGIS 9.3 and supporting map software installed. Finally, WDFW purchased two new GPS units to replace end of life units.

Work Element: 160   Create/Manage/Maintain Database

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 2009, summarized by Work Element Title

CRITFC   The Koha library software was upgraded during FY-09. All other systems for managing and disseminating data were maintained. Except for the Library system, all application support was provided by other funding.

FWS   The CRiS database was continually maintained to increase data quality obtained both from national fish hatcheries and fisheries offices in the Columbia River Basin.

IDFG   A beta-test version of the new Spawning Ground Survey data system was completed and tested by several IDFG biologists. This fall it is planned that additional biologists will use it to enter their 2009 spawning ground survey data. Using non-StreamNet funds, a test version of the spawning module was used at several hatcheries this past Chinook return season. Several bugs and changes were identified and being worked on. A new version of the IDFG Standard Stream Survey was worked on. It will provide new features that should make data entry and reporting more efficient. One change to the SSS links it directly to the hydrography layer so that any time a new stream is added it will immediately show in the SSS application. A new hydro editing protocol was developed to speed the addition of streams, finally moving the editing process out of Workstation ArcINFO and completely into ArcGIS Desktop.

MFWP   Numerous scoping meetings regarding a centralized fisheries data system occurred throughout the year with the Fisheries Bureau and application development staff. Database documentation and data flow diagrams were created for the scoping; progress was slow. Annual enhancements to MFISH/INFISH and the Fisheries GIS layers were made. Enhancements and modifications were made to the Fishing Log, State Fish Record, Restoration, and Fishing Regulations user interfaces which are used by staff of the Fisheries Bureau.

ODFW   Application and interface development and maintenance efforts resumed with the filling of one of Oregon StreamNet's programmer positions. Development of an application to facilitate change requests to Fish Habitat Distribution data resumed in the form of reviewing and updating the application requirements. It may ultimately take a GIS application developer specialist to create the application that's envisioned. We modified the MS Access Trapping Database Template for use by the Partnership for the Umpqua Rivers to enter 10 + years of trapping data. Oregon StreamNet's inventory tracking system was migrated from MySQL to SQL Server 2000 and fixes were applied to improve updating capabilities.

GIS staff created a new enterprise geodatabase for managing ODFW specific fish passage barrier data. This structure will be more conducive to replicating the geodatabase and facilitating distributed editing. Also, problems were corrected with four ArcIMS applications that were affected when new watershed boundary datasets were posted to the server. In addition, we provided input to ODFW and ODOT staff who want to develop a field data collection form / template that enables compliance with the fish passage barrier data standard that also captures some of the key optional elements.

The data structure and user interface for Oregon's Trend database was modified to be able to track SOTR focal species by subbasin, trends that are used in the SOTR, and trends that have had their measures changed due to the new mixed-scale hydro. These changes will better help us to prioritize the trends that need to be updated for the SOTR, based on the current StreamNet Statement of Work.

Staff provided consultative support to the development of the Oregon Hunting Access Map (ORHAM) web application. Any long-term support that's needed for this effort will be funded through non-StreamNet sources.

We loaded ODF Fish presence datasets into the enterprise fish geodatabase and updated the ODFW GIS Data Catalog to include tax lot data, watercourse data, fish presence and numerous other datasets.

Region   PSMFC began using the 2007 version of the Microsoft Office suite in September 2008. In June of 2009 we discovered a significant bug in the Access 2007 database software that has the potential to cause serious data loss. The bug involves a non-obvious ambiguity when changing or deleting tables or shortcuts to tables while using "Custom Views," or when changing names of tables or shortcuts. Because of the potentially serious consequences of this bug, PSMFC personnel sent a memo to the other StreamNet partners and also to others outside of StreamNet, alerting them to this potential problem.

CRITFC GIS staff created and shared with PSMFC an application that lets the user find the distance to the ocean from any spot in the hydrography network. PSMFC staff tested it, found a few bugs, and provided feedback. PSMFC also provided some other ideas for increasing the utility of the application, which CRITFC subsequently incorporated. It now can find the distance between any two points in the hydrography network. This application may prove useful for such uses as finding the distance between spawning grounds to help geneticists with their analyses.

PSMFC completed a template for the online version of the Data Store's Data Publishing Service. This new version meets the FGDC metadata standard for creating a StreamNet extension to the Biological Data Profile of the FGDC metadata standard. Programming to implement this new tool did not begin before the end of the fiscal year.

PSMFC GIS staff attended steering committee meetings of the PNW Hydrography Framework Clearinghouse (PNWHFC) in order to keep abreast of the group's efforts to develop applications that facilitate managing linear event data referenced to the National Hydrography Dataset (NHD).

WDFW   The WDFW StreamNet Location Data Manager commenced building mixed scale hydro cross-references this year for hatchery release data and juvenile trap data eventually destined for a StreamNet submission. MS Access was employed to replace any functionality previous available in Paradox. Simplified file documentation was established to implement a solution for easy field documentation and other miscellaneous functions.

Other miscellaneous application and interface improvements included:
* Creating new macros and links to tie rolled up data back to the original agency data,
* Beginning work on natural spawner data exchange improvement, establishment of a 'one-stop shopping place' for all StreamNet georeferences.
* Creation of a new database for storage of biological data collected at hatcheries, spawning grounds and from the sport fisheries. This system was installed in the WDFW Vancouver regional office as well as the Pasco field station.

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 posted on the StreamNet website. Work will have started on developing metadata templates. Metadata are published as Web Services.

Project   Accomplishments During Fiscal Year 2009, summarized by Work Element Title

CRITFC   Metadata for the StreamNet Library catalog were maintained. In addition an XML copy of the database was added as a feature in Koha 3.0. These metadata are now searchable via Internet search engines. In addition, the metadata for library materials were also maintained in OCLC (an international bibliographic cooperative) that is searchable via WorldCat.org. This website offers the general public the opportunity to search the holdings of the members of OCLC and find materials that match their research needs in local libraries.

FWS   FWS participated in the discussions leading the posting of dates on the StreamNet website.

IDFG   IDFG StreamNet worked with IDFG personnel to develop better data management strategies and metadata requirements.

Additionally, working with IDFG's Southwest Region office, IDFG StreamNet staff helped them develop data management strategies, georeference data and create minimum metadata requirements. Procedures were developed with IDFG biologists for entering, quality checking and submitting data to central databases. Quality checks were completed for the 2006-2008 hatchery return data, rectifying them with the associated brood year reports.

Frequent checks and corrections were made to the generalized fish distribution, redd count, hatchery return and reference data sets. Working with PSMFC and Montana FWP personnel, some overlapping fish distribution records in StreamNet were fixed. Metadata for the Standard Stream Survey, Spawning Ground Survey, Juvenile Trapping and Hatchery databases were compiled and updated.

MFWP   Maintenance level enhancements were made to the fisheries data contained in the FWP Mapper and web-based GIS downloads. Internal quality assurance/quality control procedures were documented and the database and values examined.

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. Staff coordinated with Regional StreamNet to confirm correctness and/or rectify discrepancies that were discovered during routine QA/QC processes. Time was also spent this year consolidating 12 versions of the ODFW Bibliography Database into a single master version.

With each data submission, we worked with Regional StreamNet staff to ensure exchange compliance. This included updating titles to five dynamic electronic databases, per recommendations by the StreamNet Librarian and regional staff. Locations/measures for trends that were affected by the StreamNet regional MSH were adjusted. Pending hatchery location mismatches from the FY-2008 data submission were resolved. Ambiguous locations associated with historical hatchery-related facilities that are no longer in operation and ports with associated sport catch trends were assigned coordinates or designated as a non-stream point.

The barrier data migration to the new MSH created some orphaned records or gaps in the associated detail tables so we worked to ensure compatibility in the new ODFW Barrier enterprise geodatabase. We also drafted a document describing the procedures for correcting the locations of culvert barriers with unknown passage status and tracking the changes.

Fish habitat distribution data were organized into categories and replicate geodatabases were created to enable distributed editing by field staff. To date, field staff have not begun to do any editing in the replicate copies of the geodatabase.

Metadata were created or updated for ODFW's Fish Habitat Distribution, Barrier standard datasets and the Oregon mixed scale hydrography layer. StreamNet staff continued to work with data contributors to add and update metadata records contained in the ODFW Data Clearinghouse.

Region   PSMFC staff found a number of errors in existing data and informed the source agencies. For example, several hatchery return records in Idaho were listed as green eggs returning to the hatchery rather than adult fish returning. Another example is a supposed record of coastal cutthroat trout in the Spokane drainage in eastern Washington. Both these errors were corrected by the state agency partners and in the central StreamNet database.

PSMFC staff worked with WDFW staff to standardize units of fish counts per area or distance from uncommonly-used metric units to the English units generally used in StreamNet.

All data submitted to StreamNet in the data exchange format were promptly quality checked, loaded and made available on-line as soon as possible (details available on request). This year the project rolled out mixed scale hydrography, which includes 1:100,000 scale hydrography as well as higher resolution hydrography where fishery data is available at that scale. This enhancement required virtually all data in the State of Washington to be resubmitted and reloaded.

An instance of SQL Server was installed on an externally accessible database server this project year, and three databases were created for use by users outside of the Pacific States Marine Fisheries Commission. One database was created to support a website for the Pacific Northwest Aquatic Monitoring Partnership (PNAMP), and another database was created for PNAMP to manage Pacific Northwest data collection protocols. A third external database was created for StreamNet data compilers in fish and wildlife agencies to have access to a copy of the StreamNet master database, which has the most current fishery data, geo-referencing tables, and views and stored procedures used for quality assurance purposes.

StreamNet technical staff participated in four quarterly meetings to resolve technical issues relating to data coding and exchange issues.

WDFW   WDFW StreamNet staff submitted a barriers table update in the first quarter of 2009. The WDFW StreamNet Locations Data Manager researched any pre-existing StreamNet records which still resort to a generic location coding scheme. These records will be re-confirmed or re-assigned as needed. A geospatial cross-reference was created for any new natural spawner data.

WDFW 's StreamNet Data Manager created a database containing all assigned values to data compilers. This dataset is accessible over the network now and can be updated in real time. Additionally, a new record ID for age and hatchery returns data was implemented for tracking purposes.

The WDFW StreamNet Location Data Manager finalized the georeferences for the Eastern Washington natural spawner data and submitted them in the third quarter. WDFW submitted new location codes (SuperCodes and point IDs) and prepared cross-references to support subsequent data submissions by the Eastern and Western Columbia data compilers. This location data supports barrier and adult abundance data.

Work Element: 160   Create/Manage/Maintain Database

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 2009, summarized by Work Element Title

CRITFC   CRITFC staff were not required to participate in any DEF updates since discussions took place only in the technical work group, not the Steering Committee. We did not request or comment on any additions or changes in FY-09.

FWS   No DEFs affecting FWS were discussed during the year.

IDFG   The IDFG StreamNet data manager participated in StreamNet Technical Committee meetings to resolve a number of data exchange format issues. A new supertrend data exchange format was designed, tested, and proposed to the technical committee.

MFWP   MFWP staff participated and contributed to discussions during technical committee meetings on DEF related issues.

ODFW   We participated in discussions and exercises regarding DEF updates and potential changes to the Hatchery Return data tables and the need for hatchery ID fields, as well as the development of a SuperTrends DEF. Oregon StreamNet's Data Analyst spent considerable time reviewing and applying data to proposed SuperTrend development options using spring Chinook spawning ground survey data from the Grande Ronde and Imnaha subbasins as Oregon's example for SuperTrends. Staff also spent time reviewing the draft 2009.1 DEF upon its release.

Region   For the first time in 3 years, a new official StreamNet Data Exchange Format document was adopted on July 17, 2009. This is version 2009.1. Many of the changes do not change the data structure asked for, but do better define the previously-existing tables and fields and codes and provide further direction for when providing data. Changes include the following:
1) As is fairly common, codes were added as necessary to capture data in the StreamNet database.
2) PSMFC and USFWS staff recommended a possible change to account for known differences in disposition between fish from different capture locations.
3) An "EndExtentID" field for stream locations was added to indicate whether an EndFt very near the headwaters of a stream is meant to represent the top of the stream, or whether it is meant to be slightly short of the end of the stream. This field is also used to indicate if a measure is intended to represent a state boundary.
4) "Trend groups" were added. This provides the ability to group related trends. For example, the early years of spawning ground counts are often exploratory in nature and are thus extensive. As experience is gained, the area surveyed is decreased to save effort. This results in two different time series, but both are meant to represent the same thing. In this case, a "Trend group" can be created to tie these two trends together and explain the relationship. Another example is that trend groups can be used to tie together the redd counts, live fish counts, and carcass counts that are stored in StreamNet as separate trends, but which in fact should be related to each other because they are part of the same spawning ground survey.
5) A "BasisID" field was added to the fish distribution table in order to characterize the information from which the fish distribution record is created. For example, whether a record is extrapolated from a single observation, from multiple observations, or from judgment based on observations in other streams.

Other potential changes were discussed subsequent to the adoption of version 2009.1. The technical committee discussed the meaning of "peak" counts contained in the StreamNet database. A tentative decision was made during the July 2009 technical meeting to change the Data Category for live fish, dead fish, and redds counted during spawning ground surveys. This approach was slightly altered at the first technical committee meeting in FY-10 and will be implemented in FY-10.

We also discussed the need to separate some life history information from where it currently resides in the Run lookup table and instead add a field to capture life history information where appropriate. This discussion extended into FY-10 and should be resolved during that fiscal year.

Milestone 6 of this Work Element was to develop a data exchange standard for capturing data which are part of a survey designed using the EPA's Environmental Monitoring & Assessment Program's Generalized Random Tessellation Stratified (GRTS) approach. However, this attempt is proving very difficult, and significant additional research with statisticians is required. We have deferred trying to fully capture these types of data until we can locate one or more experts who can fully educate us on the requirements.

The PSMFC biologist, partially under other funding, developed and tested a new paradigm for gathering and disseminating fish data through StreamNet. The current paradigm is based on time series -- a.k.a. "Trends." In the trends paradigm, the time series is the main concept, and each observation is an instance of a time series. The trends paradigm is awkward for single observations. It also is not designed for individual animal observations, which may be of interest at times. The new paradigm is based on observations. Under this paradigm a time series is also possible, but is developed by associating individual observations. This new database structure also allows data for individual fish, and allows non-ambiguously associating multiple observations and identifying targeted taxa. This new database approach was tested mainly under other funding, with StreamNet funding used for supervision and guidance. The data being captured during this test are mainly observations of coastal cutthroat trout (*Oncorhynchus clarkii clarkii*) throughout the subspecies's range. Included are the coastal cutthroat trout data currently available in StreamNet. These newly captured data will be added to the StreamNet data system in the future, most likely in the Data Store initially. The tests are showing that this database approach is functional and provides the ability to capture more data than the current

WDFW   The WDFW StreamNet data manager reviewed the Hatchery Returns DEF to work out inconsistencies among states in delivering detailed return data. StreamNet headquarters updated the DEF for future reference and clarity.

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 2009, summarized by Work Element Title

CRITFC   The StreamNet Library continued to maintain the library website at fishlib.org, updating the site and information as needed. Additionally, work continued on ensuring that all digital documents are linked to records in the StreamNet Library catalog.

IDFG   IDFG worked with PSMFC to identify and fix the download GIS data features on the StreamNet website. The IDFG StreamNet data manager found a break in a link from the USEPA Water Quality Standards Web site and the StreamNet Library Web site, which was fixed by PSMFC personnel.

MFWP   Montana staff participated in review of the new StreamNet Web site.

ODFW   Functionality-related feedback was provided to Regional StreamNet staff throughout the year. Focused attention was given to reviewing the new StreamNet website and the online query system.

All Oregon StreamNet websites were maintained and updated as needed throughout the year. We continued to manage and maintain the Corvallis Research Lab's 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.

Conflicting priorities for new staff prevented us from establishing the ability to track and maintain web usage statistics. We plan to get this instituted in FY-10.

Region   A major accomplishment this fiscal year was the completion and roll-out of a major update to the StreamNet web site, www.streamnet.org. The initial work toward this effort began during fiscal year 2007, and the newly redesigned web site went live on March 6, 2009. All static html pages, as well as the database query system, the Data Store, and the online mappers were updated. This effort involved evaluating roughly 1500 existing static html pages that had been created over the years, and determining what information to keep. We also had to design a general layout for the web site. At the end of the process, fewer than 70 static html pages were used to create the new web site, greatly decreasing the complexity of web site maintenance and improving the ease of use of the web site for StreamNet users. A great deal of error-checking and debugging went into creation of the new web site.

With the creation of the new web site and a better mechanism for reporting accomplishments, we have been providing more detailed information in the "What's New" section to help users stay abreast of changes in resources available to them.

In addition to the redesign, a number of query system issues were identified and corrected, such as fixing a missing location in the query system output.

In February 2009, all web site statistics gathering was switched from Webtrends to Google Analytics. Analytics is a free web based service provided by Google that uses a Javascript tracking "cookie" to collect information on web site usage and then allows easy reporting by many parameters. We switched after several years of using Webtrends, which appeared to do a reasonable job on analyzing and reporting web site statistics, but the process required for reporting and the ability of the program to identify web site users without several time consuming extra steps were not fully satisfactory. Identifying users of the StreamNet web site, data query system, and mapping applications is a high priority for the project.

To date, we are very satisfied with the results of switching to Google Analytics. The numbers of users and page views reported correlate well with observations of users interacting with the StreamNet website. Google also seems to do a much better job of identifying unique users and sessions on the website, query, and mapping applications. The ability of Google Analytics to identify users vastly surpasses any web statistics program we have used previously.

WDFW   Washington StreamNet staff members participated in review of the revised StreamNet website.

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 2009, summarized by Work Element Title

FWS   No StreamNet specific data requests were received or responded to this year.

IDFG StreamNet provided responses to over 214 data requests that came directly to IDFG (Tables 1, 2 and 3). Those requests came from federal, state, local and private organizations. Requests for fish species distribution far outnumbered any other data category. More complete details on data requests are available.

MFWP Nearly 70 fisheries related requests for maps, data or web content occurred during the year (Tables 1, 2 and 3). All requests were successfully fulfilled.

ODFW Oregon responded to 310 requests; 204 from ODFW requesters and 106 from external requesters (Tables 1, 2 and 3).

Region PSMFC responded to 60 special requests for data or other assistance during the fiscal year. Breakdowns of the type of requests, requesting entities and success of the responses are contained in Tables 1, 2 and 3.

WDFW WDFW StreamNet data compilers responded to 24 data requests by agency biologists and others (Tables 1, 2 and 3). These requests included: Washougal River fall Chinook age data, Olequa coho survey data, chum survey information, spawning ground survey data for Hamilton Spring Channel, Coweeman, and Lewis mainstem and tributaries as well as Cedar Cr. adult trap data. The WDFW Location Data Manager responded to 2 data requests from regional biologists this year.

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 2009, summarized by Work Element Title

CRITFC Public information materials were distributed at a number of conferences including the OWEB meeting for watershed councils. For meetings that were too distant or expensive to attend, sponsors often distributed library materials for us. Library staff members were able to participate in several professional conferences this year. The StreamNet Librarian attended the Koha users conference, gaining better understanding of the software and several changes to the software to enhance local users capabilities. The Oregon Virtual Reference Seminar in June inspired the library staff to use social networking tools to reach out to potential customers and provide information to people asking questions via these networks, allowing questions that otherwise would be dropped to be answered. Library staff benefitted from networking opportunities with other regional libraries during the annual Pacific Northwest Library Association Conference, which normally results in an increase in referrals and interlibrary lending. The final conference was the International Association of Aquatic & Marine Science Libraries and Information Centers; the StreamNet Librarian attended this conference to participate in the exchange of best practices for all levels of library management for these specialized topics.

 StreamNet Library staff members also attend public events as information table hosts and volunteers, allowing us to reach out and answer questions where the customers are rather than waiting for customers to find us. Examples included the Sturgeon Festival in Vancouver and the Oxbow Salmon Festival.

FWS StreamNet was mentioned as a useful data source during routine discussions with colleagues throughout the year.

IDFG Throughout the year, we worked with IDFG and partner biologists to explain both the role IDFG StreamNet has in helping their specific needs and the data that the StreamNet has available. We also worked with many data requesters, often just pointing them directly to the StreamNet Web site. Many comments of surprise and pleasure were made about the wealth of information available there.

MFWP StreamNet data continues to be used and enhanced for the FWP Crucial Areas Assessment. StreamNet staff presented data and provided training on available resources at the Montana AFS meeting in Kalispell. The StreamNet data model and requirements have been discussed as part of the centralized survey and inventory database discussions. The Yellowstone Cutthroat Trout Assessment data is housed in the StreamNet Data Store and staff have directed any requests for the data to the StreamNet website.

ODFW   Oregon StreamNet staff gave several presentations this year, including presenting a poster on the Fish Passage Barrier Data Standard and Inventory Project at the Oregon Chapter American Fisheries Society conference. The inventory effort was also presented at the ODFW Fish Biologists meeting where we obtained feedback from several biologists on what would be most useful to them, and a barrier standard presentation was given to the Oregon Fish Passage Task Force. The GIS Coordinator gave a half-day GIS training workshop at the Fish Biologist meeting to 8 ODFW staff. Relevant training such as this greatly promotes and enhances StreamNet's ability to acquire useful and usable data from field staff.

Region   Two PSMFC staff members gave presentations at two professional society meetings this year.

            The first meeting was the annual meeting of the Washington / British Columbia Chapter of the American Fisheries Society. At this meeting a poster about the StreamNet project and the resources available from StreamNet was presented. A second poster was presented about the coastal cutthroat trout initiative which StreamNet is assisting. An oral presentation on the Protected Areas list of the NPCC that StreamNet maintains and makes available was also given. Nobody in the audience was familiar with the Protected Areas list (save one NPCC member who we had met with personally in the past), so this presentation was of value in spreading knowledge about this important NPCC effort.

            The second meeting was the annual meeting of the Organization of Fish and Wildlife Information Managers. Three oral presentations and one poster presentation were given. The first presentation described the data structure which PSMFC is developing and testing for capturing observations data (See Work Element 2.160.4). The second presentation described the Data Sharing Guide developed by StreamNet. The third presentation described a digital pen that works with Excel to capture field data directly into spreadsheet format and earned the Best Presentation award at the meeting. The poster presentation demonstrated the newly designed StreamNet website and its improved ease of use for finding data.

            The StreamNet Newsletter (number 10) was published and sent to 877 people on May 19, 2009. A second Newsletter was being developed at the end of the fiscal year but it wasn't published until October 30, 2009.

WDFW   WDFW StreamNet Staff attended several regional meetings in the 2009 fiscal year. These included, but are not limited to:
            * Montana NHD meeting, Helena, MT Aug. 24-26, 2009
            * NHD stewardship conference, Denver, CO April 13-17, 2009, where regional StreamNet and PNWHF issues were discussed.
            * NWGIS conference, Sun Valley, ID Oct. 21 - 24, 2008, where the StreamNet locations data manager presented a paper on Washington's efforts to move to NHD and its possible implications for StreamNet.

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 2009, summarized by Work Element Title

CRITFC   The library staff provided services to customers as requested. These services included locating data, filling information requests, providing scanned or physical copies of requested information, and interlibrary loans. The library staff also began pushing information out to potential customers via social networking sites such as Facebook and Twitter as well as working with online help sites such as GreenAnswers.com. These efforts have resulted in an increase in customer requests and services provided.

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 2009, summarized by Work Element Title

CRITFC   The library was able to maintain access to the collections during normal business hours for 99.9% of FY-09. The library staff also began providing access to information to potential customers via social networking sites such as Facebook and Twitter as well as working with online help sites such as GreenAnswers.com. These efforts have resulted in an increase in customer requests and services provided.

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 and service 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 relative to data development activities (e.g., CBFWA), advisory groups, task forces, and other groups (e.g., PNAMP, NED, CSMEP) whose purpose is to enhance the effectiveness of the Fish and Wildlife Program. This also includes planning for the next round of subbasin planning and related activities.

Deliverable   StreamNet staff have participated actively in and supported a number of projects funded through the FWP, including CBFWA, PNAMP, NED and CSMEP. StreamNet is a recognized component of the regional data management framework.

Project   Accomplishments During Fiscal Year 2009, summarized by Work Element Title

CRITFC   The CRITFC StreamNet Project Leader maintains membership and is active in CBFWA committees and the PNAMP Steering Committee. The Tribal Data Steward (funded with other BPA funds) is an active member in PNAMP data work groups. StreamNet Library staff supported research for the various groups and projects under the Fish and Wildlife Program.

IDFG   IDFG StreamNet worked closely with the ISEMP project on data exchange. We provided them a database structures and data for several of the data types that they need. We also developed a data exchange protocol for future data updates. IDFG StreamNet continued its long relationship with the Idaho Supplementation Studies (ISS) project. ISS data now is fed directly into centralized databases which are harvested for data submissions to StreamNet.

MFWP   StreamNet staff reviewed PNAMP proposals submitted by PSFMC and the StreamNet Steering Committee. StreamNet staff are contributing to the discussion of centralizing the cutthroat trout assessment databases which has an impact both within and outside the StreamNet region. Staff reviewed and provided comments to the CBFWA SOTR 2009 report. Staff participated in discussions about regional hydrography including providing advice about data management.

ODFW   We responded to a few large-scale requests from FWP funded projects, including searching for and compiling historic juvenile Chinook and steelhead count data at the lower Columbia dams for a project in the north Willamette, providing information we had or could compile for the John Day to NPCC staff, and performing an analysis of resident fish habitat changes on the mainstem Columbia and Snake Rivers pre and post impoundments for ODFW's Columbia River Investigations Program.

The Oregon StreamNet Project Leader participated in a number of regularly scheduled PNAMP meetings, contributing to shared discussions about data management-related activities and future directions or funding options.

Oregon StreamNet and ODFW executive staff attended the PNAMP/NED/PNW-RGIC Executive Data Summit, and reviewed and commented on data management recommendations.

Region The StreamNet project continued active involvement in several regional scale programs, including the Pacific Northwest Aquatic Monitoring Partnership (PNAMP) and the Status of the Resource (SOTR) report produced by the Columbia Basin Fish and Wildlife Authority (CBFWA).

The StreamNet Program Manager represented the project and PSMFC on the PNAMP Steering Committee, and also remained active in the Data Management Leadership Team and other PNAMP work groups, including the Metadata work group. Other project staff members also participate in various PNAMP work groups, including the Effectiveness Monitoring work group. During the fiscal year, StreamNet released a data sharing guide titled Considerations for Regional Data Collection, Sharing and Exchange and submitted it to PNAMP for their review and possible recommendation. The PNAMP Steering Committee approved the document and forwarded it to their formal approval process. The guide was targeted at the many entities that have roles to play in effective data sharing and outlined recommended actions within each role. The roles included data creator (field staff), data creating agencies, funding entities, policy makers, and technical data projects. Each has a different role to play, and all roles need to be performed to support wide scale data sharing.

Data to support the SOTR was a primary goal this year. The Steering Committee members agreed to make updates to data to support assessments in the SOTR report a primary objective. PSMFC StreamNet developed a web service designed to transmit data directly to CBFWA for inclusion in the SOTR. CBFWA did not have time during the year to fully implement the data feed on their end, but StreamNet will continue to work with CBFWA to implement this approach, which will ultimately save time in creating the annual report.

Meetings were attended to support both Hatchery Scientific Review Group (HSRG) contractors directly and CRITFC subcontractors with the HSRG data maintenance. Two servers were purchased and maintained to make HSRG products available online.

WDFW WDFW StreamNet staff attended a meeting in Yakima with the tribes as well as a phone conference for the discussion of future PNAMP funded proposals in Washington. StreamNet data managers in Washington also participated in a number of regional meetings concerning Columbia River monitoring and evaluation efforts.

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 staff 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 2009, summarized by Work Element Title

CRITFC A Tribal Data Steward was hired in April 2009 and has developed and received funding for a project to improve sharing of tribal data. Prototype projects have been identified for the Nez Perce Tribe and the Yakama Nation. Planning for a tribal data workshop in the second quarter of FY-10 was begun.

IDFG A very strong working partnership has developed among IDFG StreamNet, IDFG Fisheries, US Fish and Wildlife Service, Lower Snake River Compensation Plan, Nez Perce Tribe, Idaho Power Company and others relative to data management for fisheries. We have developed several centralized databases and data-entry applications to capture data from across the region. Data access tools have also been built that allow all partners to access all datasets. The primary databases are hatchery returns, hatchery spawning, spawning ground surveys and stream surveys.

MFWP   StreamNet staff contributed to a meeting regarding "common minimums" of fisheries data collection. This was part of the centralized fisheries data system scoping. Database documentation and data flow diagrams were completed to identify ways to improve data flow and quality. Discussions with FWP application development staff and the Minnesota DNR occurred to gather information on the Minnesota DNR procedure for automating dataflow and its applicability to Montana FWP data capture. A document was started by StreamNet staff that identifies perceived inefficiencies in fisheries data collection and submission in an effort to improve data flow and data quality.

ODFW   Oregon StreamNet staff continued to draft data development proposals and coordinate with staff from the Dept. of Administrative services, the Oregon Watershed Enhancement Board and the Oregon Dept. of Transportation (ODOT) to obtain funding to increase Oregon barrier information in the Oregon Fish Passage Barrier Data Standard. A methodology was devised cross-walking the ODFW, BLM and ODOT fish passage barrier data to the Oregon Fish Passage Barrier Data Standard format. This work allows Oregon to submit a more complete and consistent statewide barrier dataset in the most recent hydrography to the StreamNet database.

We reviewed and commented on a proposed set of attributes for field collection of barrier information, and met with ODFW and ODOT staff to discuss workflows for preparing for and conducting field data collection and integrating those data back into agency barrier databases. Follow-up included discussions on necessary refinements to the database, overall workflow, and the need for testing re-incorporation of the field data into the parent barrier database. A geodatabase that is specific for data collection may be necessary in order to address the limitations of ArcPad in working with related tables.

Staff continued exploratory discussions with ODOT regarding developing a comprehensive native migratory fish dataset. 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 is slated to begin next fiscal year. We met with ODFW staff from the adult, juvenile and habitat monitoring projects to discuss opportunities for reconciling habitat distribution data and for incorporating fish passage barrier data into the ODFW barrier database. Also discussed was the idea of co-stewardship of distribution data in the coastal basins and approaches to more readily integrate current coast distribution data into the statewide fish habitat distribution datasets, which could also satisfy the same need statewide.

Oregon StreamNet staff contributed to and assisted with numerous ODFW GIS training sessions throughout the year. Over 100 ODFW staff were provided GIS training this year; most of which was funded through non-StreamNet sources. Providing this type of directly relevant training to ODFW staff aides StreamNet in acquiring targeted information in a usable format.

Staff members provided consultative support to ODFW's Wildlife and Information and Education Divisions regarding the development of an Oregon Hunting Access Map (ORHAM) application. This effort included assisting in the completion of a requirements document, researching the ArcGIS Server Javascrip API and the Google Maps extension in order to better understand its capabilities and limitations and collaboratively deliberated the pros and cons of going with open source vs. a proprietary solution. This effort has highlighted the need for a GIS application developer in ODFW and spawned discussions about pooling funds to meet this need. Staff also reviewed and edited the Fish Screening and Passage Web Application User Manual.

Staff members continued to chair and participate in the ODFW GIS Coordination Group, including several Group and Subgroup meetings. Effort this year continued to focus on putting into action short-term GIS Implementation Plan actions in the face of no additional funding, and producing quarterly GIS Newsletters for agency staff. Oregon StreamNet staff wrote articles or documents on a number of topics including metadata, data management principles, Enterprise License Agreement (ELA) status, and a GIS software needs Assessment guidance document.

Considerable time was also spent coordinating the agency's enterprise GIS license agreement. Coordinating the cost-sharing, developing a GIS license request form and multi-step process for requesting licenses and devising the license configurations for the various work groups were just a few of the activities associated from this effort.

Region PSMFC staff held conversations with WDFW staff about whether culverts on non-fish-bearing streams should be in the Barriers table. WDFW is using a culverts inventory database and wondered whether to send all these data to StreamNet. The decision was made that a stream known not to contain fish can't have a fish barrier. This is the same decision ODFW had previously made when deciding which stream features to send to StreamNet.

Several errors in the database were encountered by PSMFC staff this year. These were, for the most part, easily corrected. For example, a code for a reference for data in the John Day subbasin was coded incorrectly and thus pointed to the wrong document.

PSMFC staff worked with USFWS staff on formatting age data. The age data Data Exchange Format is still relatively new, and USFWS staff were learning to get age data into that format. These difficulties were resolved and the USFWS age data were incorporated into the StreamNet database.

Staff from PSMFC, WDFW, and CRITFC met in Yakima for a meeting with Yakama Tribe biologists and others to discuss StreamNet acquiring their data. By the end of the meeting WDFW and the Yakama Tribe had reached agreements for how data could be shared with StreamNet.

WDFW   WDFW StreamNet staff embarked on a joint development project to create a smolt database with the Yakama Nation. WDFW StreamNet staff also met with PNAMP staff on several occasions for discussions primarily of a data flow and compilation nature. Washington StreamNet also worked with regional project staff on development and submission of a proposal to support WDFW development of data for the Columbia estuary.

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 2009, summarized by Work Element Title

CRITFC   The StreamNet Library continued to work with local watershed councils and other natural resources-related non-profits to coordinate capture of documents and literature related to the fish, wildlife and natural resources of the Columbia River Basin.

IDFG   Database efforts included some non-FWP programs. These included the Lower Snake River Compensation Plan and the Idaho Power Company. These database projects are beginning to generate interest from other non-FWP programs on a variety of efforts. The US Forest Service has been providing data to our Standard Stream Survey database. The Coeur d'Alene Tribe has also expressed interest in the SSS, but we haven't been able to address them yet.

MFWP   StreamNet staff and other state agencies met with the Statewide Restoration Coordinator to review Montana's needs and gain a status update. Data sharing coordination continued to occur with Glacier National Park. StreamNet staff coordinated with IDFG regarding the Westslope Cutthroat Trout assessment. MFWP staff provided input into the process as well as committing resources to complete the assessment update in Montana. Montana StreamNet staff is involved with other states, federal agencies and stakeholders in the discussion of the Intercontinental Cutthroat Trout Protocol and centralized database. The goal of this project is to have a central database that houses all trout assessment data to facilitate data analysis and data consistency. MTFWP currently captures data categories not presently represented in the StreamNet data structure. MFWP will continue to collect and update this information in a consistent manner in the event the data categories are added to the StreamNet DEF. StreamNet staff attended the 2008 OFWIM conference via webinar, many of the presentations attended dealt with increasing efficiency in data capture and management.

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 the Monitoring Program. Staff from EcoTrust have developed much of the data management and dissemination tool. Oregon StreamNet staff continue to provide data and database consultation, and PSMFC may still be called upon to house the system on their server.

The GIS Coordinator corresponded with a number of groups and efforts throughout the year, including preparing examples of recent edits to the Framework Hydrography dataset and meeting with Oregon Water Resources, Oregon Dept. of Environmental Quality and Bureau of Land Management staff to discuss state and federal coordination on hydrography data development. Both the criteria and process for submitting edits to the NHD were discussed. Also discussed was the creation and maintenance of whole stream routes on the NHD as an interim measure until the respective agencies eventually adopt the NHD. Tools to assist in the creation and management of events on the NHD were also discussed. In addition, the GIS Coordinator attended a NOAA Fisheries sponsored workshop on Intrinsic Potential data. These data have tremendous potential to enable the mapping of presumed historical habitat which could support a number of FWP endeavors including the prioritization of fish passage barriers for removal. He met with staff from OWEB, DSL, INR and GEO to discuss the need for greater coordination with fish passage barrier data development and support of priority fish passage restoration efforts. He also attended the Portland area ArcGIS Server user group meeting where he learned some techniques for creating quality web maps/services.

Staff members continued to coordinate Oregon's effort to develop a statewide barrier inventory database and restoration prioritization system. We were awarded funding from OWEB and the Oregon Geographic Information Council to expand these, as well as distribution data development efforts.

The Data Analyst worked with a soon-to-be-retired ODFW employee to get years of creel survey records (26 in all) in the ODFW Data Clearinghouse, and approved one Wildlife Collision Hot Spots record for public viewing.

Region   PSMFC staff met with Xerces Society staff to discuss a mussels database Xerces is putting together. We discussed ways in which StreamNet may be able to help. For the immediate future, in order to stay on schedule, it was decided that Xerces would follow the course they were on.

PSMFC staff reviewed a draft data dictionary distributed by NOAA Fisheries at the Northwest Environmental Information Sharing Summit. We found this "data dictionary" was more of an inventory of derived indicators of salmon population size, and the general types of information needed to calculate those derived indicators. We found it could serve well as a guidance for the types of data that NMFS needs, but it was not a detailed inventory of specific data fields they need and it was not possible to map StreamNet data to needs they indicated, due to a lack of specificity in the document.

PSMFC staff reviewed a proposal submitted to the Western Native Trout Initiative by a former Colorado Division of Wildlife employee for coordination of status assessment databases for all cutthroat trout subspecies. We thought it was too little to adequately do the job, and suggested a larger effort would be necessary. StreamNet is interested in this because many cutthroat subspecies occur within the Pacific Northwest and Columbia Basin area, so some input on data collection is of interest because we may eventually deal with these data. StreamNet personnel in Idaho and Montana already are directly involved in these cutthroat trout assessments.

WDFW   WDFW StreamNet personnel embarked on a joint development project to create a smolt database in coordination with the Northwest Indian Fisheries Commission, Yakama & Colville Tribes.

Work Element: 189   Regional Coordination

Title: 4   Support regional scale reporting on status and trends

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), and High Level Indicators (HLI). 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 2009, summarized by Work Element Title

FWS   FWS continues collecting and storing information on hatchery populations.

IDFG   IDFG StreamNet has had several discussions with IDFG Fisheries regarding high level indicators. We support providing the data, but until the HLI program is finalized by the basin, IDFG StreamNet is in a waiting mode.

MFWP   StreamNet staff collect and manage data on resident fish as available to contribute to the SOTR report and to support High Level Indicators.

ODFW   Considerable focus was given to supporting CBFWA's Status of the Resource Report (SOTR) report, updating all SOTR data summaries contained in the StreamNet data system. This included gathering data for cutthroat trout in the Willamette and Fifteenmile subbasins and hatchery return goals, work not originally included in this year's SOW. Aside from compiling abundance information to populate SOTR datasets, Oregon StreamNet staff worked to reconcile StreamNet holdings with SOTR summaries, and reviewed the newly updated SOTR report for accuracy.

Region   StreamNet, working through PNAMP, continued to provide assistance and comments on development of regional scale High Level Indicators (HLI). The project sees these as important in clarifying the specific types of data that we need to provide that feed directly into creation of the various HLI.

StreamNet also placed significant effort on improving the flow of fish abundance data to CBFWA to support development of the annual Status of the Resource (SOTR) report. The Steering Committee members discussed the specific data needs with CBFWA, and agreed to make updates to data to support assessments in the SOTR report a primary objective. PSMFC

StreamNet organized several reports of StreamNet data in the Columbia Basin by Province and Subbasin to support development of the SOTR report. XML schemas of StreamNet data were provided to CBFWA, and a web service to transmit data directly to CBFWA for inclusion in the SOTR was designed. CBFWA did not have time during the year to fully implement the data feed on their end, but StreamNet will continue to work with CBFWA to implement this approach, which will ultimately save time in creating the annual report.

WDFW   WDFW StreamNet staff researched freshwater fish data that is available through the CBFWA SOTR website with the intent of determining what data might possibly be missing and what new data could be included or updated. Staff attended PNAMP meetings to determine existing High Level Indicator metrics in the basin and categorize data collection protocols.

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 the SOW is accomplished, and required SOW/budget documents are prepared and submitted on schedule.

Project   Accomplishments During Fiscal Year 2009, summarized by Work Element Title

CRITFC   All work was completed on schedule. Although CRITFC participation in the StreamNet project is provided under separate contract, all activities and reporting was closely coordinated with the main StreamNet project and contract. The CRITFC Project Leader participated in all StreamNet Steering Committee meetings to provide project guidance.

FWS   The FY 2009 Budget was submitted on time, and expenditures were managed to stay within that budget.

IDFG   The IDFG StreamNet project manager provided regular budget updates. Because of unexpected funds provided from another project, IDFG was able to return some StreamNet funds that were used by other StreamNet participants for data compilation. IDFG StreamNet staff also received appropriate supervision. The work laid out in the statement of work was accomplished. That work was reported in the required progress reports and submitted to PSMFC on time.

MFWP   Montana StreamNet performed all administrative tasks, including participation in the Steering Committee, budget tracking and personnel supervision.

ODFW   ODFW StreamNet filled one of two vacant application developer positions. They also filled both Data Technician positions, though one position was filled for only two months by two different employees due to them both getting longer term job offers after accepting our position. We continue to lack the resources to fill the second vacant developer position. The process of filling ODFW's Conservation Strategy GIS Analyst was initiated late in the fiscal year. And, staff cross-trained in the field to gain knowledge of field techniques, participated in online technological and computer security training, mandatory agency training, and attended seminars and conferences to learn about new technologies and for networking.

Region   PSMFC StreamNet continued management of the project, including organizing and hosting quarterly meetings of the StreamNet Steering Committee and quarterly meetings of the Technical Committee. These meetings provided significant input on project direction and function and on resolving various technical issues. The Region also worked to assure that all project members met their deliverables on time.

A significant change to project organization occurred this year. The CRITFC components of the project were moved from the StreamNet contract to a separate contract between CRITFC and BPA under the Columbia Basin Accords. While this change affected budgeting and reporting under separate contracts, overall project integrity was maintained and will continue into the future. CRITFC still is an active member of the StreamNet Steering Committee, and its project milestones are still integrated with the rest of the project even though they are included in separate contracts. This Annual Report is a consolidated report of all project activities under both contracts. Furthermore, additional data related activities under the Accords is intended to improve and increase the flow of tribal data, which will increase the inclusion of tribal data in StreamNet.

Staff supervision and budget management were maintained throughout the year. There were no personnel changes at PSMFC StreamNet this year. The 2009 project budget was amended to include funds rescheduled from FY-08 to support additional data acquisition in eastern Washington and in Oregon. Funds were also shifted within the year from one partner that obtained agency support for some work to another partner to expand data coverage.

WDFW   WDFW StreamNet successfully managed budgets within expanded parameters, attended the January 14 meeting at Olympia with the Regional StreamNet Coordinators and attended all quarterly StreamNet Steering Committee meeting and associated conference calls.

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 annual report is submitted on time

Project   Accomplishments During Fiscal Year 2009, summarized by Work Element Title

All   All project partners contributed to writing the annual report for FY-08. Each partner provided input on their accomplishments for the year and PSMFC StreamNet prepared and edited the full report, which was submitted to BPA on schedule.

Work Element: 185   Produce Pisces Status Report

Work Element: 1   Produce Pisces Status Report

Title: 1   **Quarterly reports**

Description   Submit a Status Report through Pisces within 15 days of the end of each period.

Deliverable   Quarterly Status Reports are submitted on schedule

Project   Accomplishments During Fiscal Year 2009, summarized by Work Element Title

All   All project partners contributed their input to the quarterly Status Reports, which PSMFC StreamNet edited and submitted to the BPA Pisces project tracking system on schedule.

APPENDIX B
Work Accomplished Outside of the Statement of Work

Work outside the SOW

Description   Work that was accomplished during the fiscal year that was not specifically contained in the annual Statement of Work. This includes work directly tied to the StreamNet goals that was done on an opportunistic basis plus work that was done by project staff members on other funding that contributed to the project goals.

Project   Accomplishments During Fiscal Year 2009

CRITFC   The Project Leader and other CRITFC staff remained active in a number of regional inter-agency data-related activities. NPCC staff solicited our advice about how to conduct and organize updates of subbasin plans so that existing data could be accessed and updates could be captured efficiently. We are working with member tribes to coordinate monitoring and analyses both internally among the tribes and externally with a number of inter-agency work groups. CRITFC staff members are also working with member tribes to improve data management capabilities and share tribal data more broadly.

FWS   FWS StreamNet funding does not allow completion of additional work outside the SOW.

IDFG   IDFG was appointed the lead GIS/data management agency for the 2009 westslope cutthroat status update. Two people using non-StreamNet funds were appointed to lead that effort. They have committed over 8 months of time, so far, to it. The existing database was improved, a new data entry application was created, and many maps were created. The IDFG staff organized and attended 10 workshops in Idaho, Montana, Oregon and Washington, during which they worked with biologists to update the data, as necessary, in the previous status database. Finalization of that database is still taking place, with the Idaho StreamNet data manager providing a technical assistance role. These data, once finalized, will be used to update the StreamNet generalized fish distribution layer.

Maintenance of the StreamNet hydrography data was handed off to two IDFG GIS personnel on non-StreamNet funding. A new protocol for maintaining the StreamNet hydrography data was developed that completely moves the maintenance out of WorkStation ArcINFO and fully into ArcGIS Desktop and ArcSDE. The new protocol will speed editing of the hydrography. It is planned that an effort will begin in FY-10 to develop the existing 24K NHD in Idaho into a whole-stream system for replacement of the current 100K hydrography.

MFWP   Data Services staff focused considerable attention on data layer development and analysis for the Crucial Areas Assessment, an enhancement to Montana's Comprehensive Fish and Wildlife Conservation Strategy. Fisheries data housed in the Montana Fisheries Information System (Montana's StreamNet database) were used extensively and updated a considerable amount as a result of the analysis that was conducted as part of the Assessment. StreamNet staff played a supporting role in the scoping of a Comprehensive Fish and Wildlife Information System; agency priority of this system development slipped throughout the year. Another major initiative of the Data Services staff was moving GIS mapping services to GIS Arc Server.

ODFW   Non-Columbia fish distribution data were updated and/or maintained. 111 unique coho habitat extensions were identified and added when monitoring project data were compared to existing distribution. Also 8 new stream reaches not previously having coho spawning distribution were added. Refinements were made to the metadata as a result of these changes. 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 as version 1.0 of the Oregon Fish Habitat Distribution Data Standard (OFHDDS) via the NRIMP Internet page.

Significant effort went into expanding the non-Columbia portion of the ODFW Fish Passage Barrier dataset and converting that data and other data into the Oregon Fish Passage Barrier Data Standard format (OFPBDS). This included incorporating data from BLM (3,233 barriers) and initiating the incorporation of data from ODOT. We also obtained data from the Umpqua Basin Fish Access Team (UBFAT). Comparing these data to ODFW's barrier data in the Umpqua River basin revealed integration issues that will need to be addressed if and when we get to the point of incorporating local datasets toward the end of the initial inventory project. 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.

Oregon StreamNet staff support of the Comprehensive Wildlife Conservation Strategy (Conservation Strategy) continued

throughout the year, though at a greatly reduced level, mainly focused on providing data development through GIS and analytical support. Support of the ArcIMS web application Conservation Opportunity Areas (COA) Explorer (http://nrimp.dfw.state.or.us/website/coaexplorer) continued as well. The site provides access to the Strategy's COAs, along with other relevant layers (e.g. habitat, vegetation).

We continued support of the online Fish Screening and Passage Database. This work was performed most of the year by a contracted programmer, then by the permanent StreamNet Application Developer. Version 1 of an online application to modernize fish transportation and propagation permitting in the state was also completed this year.

Wildlife Division GIS support continued throughout the year, including: filling general map requests; updating wildlife area maps; geo-referencing 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.

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   Primarily under funding from other sources, PSMFC staff participated on two projects that are anticipated to have benefits for StreamNet in the future:

One project, with funding by the USFWS's Pacific Southwest Region (California, Nevada, and Klamath Basin), involves examining data sets and field methods and statistical analyses used when rotary screw traps are employed to determine the production of out-migrating salmonids in California's Central Valley (the San Francisco Bay / Sacramento River / San Joaquin River basin). A statistician hired as a subcontractor on that project is examining the various analytical techniques employed in the Central Valley, and determining the most appropriate methods to use. The results of this project will be useful to help guide StreamNet in the future as we begin to capture more juvenile production data. It should also result in valuable suggestions for people estimating production of smolts in the Pacific Northwest.

The other project, funded by Pacific States Marine Fisheries Commission, the Western Native Trout Initiative, and the Wallop Breaux Sport Fish Restoration Act, is aimed at eventually producing a range-wide assessment for coastal cutthroat trout (*Oncorhynchus clarkii clarkii*). The first stage of this project, which PSMFC's StreamNet staff is guiding, is to create a database of documented observations of the subspecies. To capture observation data, the effort is employing the observations-based database which PSMFC StreamNet envisions could be the new paradigm for StreamNet observations and time series (trend) data. Thus this funding is providing an opportunity to test the new paradigm. As the database structure has been employed, it has been modified as necessary to capture source data of different configurations, and queries and macros are created to manipulate the data as necessary. Data have been captured and tied to source documents, and a simple map-based Internet interface and query system has been created to provide access to the data. Results of this test have been very promising, and as this project continues we expect that a clear path toward a potential paradigm shift for StreamNet data capture and delivery could result.

WDFW   Staff continued refinement of high level indicators for primary and listed species in Columbia River and Puget Sound. Additionally, WDFW continued efforts to build Washington's Hatchery Harvest Work Schedule statewide data server and web-based reporting tool. We began a number of efforts to clean up and make available internal corporate data sets. These include, but are not limited to: an in-stream water quality atlas effort in conjunction with Washington Department of Ecology, completion of the Fishbooks statewide hatchery data management system, conversion of hydrography layers to NHD in some pilot watersheds, and others.

On an opportunistic basis, the Location Data Manager completed half the georeferences needed for RECFIN data. Further georeference work must involve input from the data documenters.