



StreamNet Project

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Executive Summary

Fiscal Year 2008 (FY-08) represents a transitional year for the StreamNet project. While the project continued to acquire/update, standardize, georeference and disseminate fish-related data for the state, some tribal and one federal fisheries agencies, it also took on several new initiatives and is anticipating new regional guidance on data needs. Passage of the Columbia Basin Accords caused an administrative change within the project, separating the work done by the Columbia River Inter-Tribal Fish Commission (CRITFC) out to a separate contract with BPA. This will change the structure of the StreamNet contract but not change the relationship with the StreamNet Library or data developed by CRITFC, and will likely increase the availability of tribal data to StreamNet due to increased funding for tribal data efforts. This change will take effect in FY-09. We also expect that data work will be adjusted in the future in response to executive level policy direction in the Columbia Basin based on efforts to establish priorities under a regional data management framework.

Data development emphasis was shifted this year to place highest priority on data that support indicators of fish abundance for the focal species covered in the Status of the Resource (SOTR) report, as requested by the Columbia Basin Fish and Wildlife Authority (CBFWA) Data Management Framework Subcommittee. We instituted an XML based web service allowing direct access to data from the project database for CBFWA to update the SOTR report. The project also increased efforts to work with tribal fisheries managers to provide data related assistance and to include tribal data in the StreamNet database.

A primary theme this year was exploring means to speed the flow of data. We had ongoing success in our strategic emphasis on increasing automation of data conversion through development of comprehensive database systems within our partner agencies, as outlined in our Vision and Strategic Plan (ftp://ftp.streamnet.org/pub/streamnet/projman_files/StreamNet_Vision-Strategic_Plan2006.pdf). By assisting development of internal database systems, we will be able to automate conversion of agency data to the regionally consistent format as well as help the agency better meet their own data needs. The Idaho StreamNet project contributed to development of IDFG's Idaho Fish and Wildlife Information System (IFWIS), and this year they successfully tested automatic conversion of data to the regional exchange format. We worked with WDFW and developed draft field data input templates for collection of smolt trap and spawning ground survey data. And, we began collaborating in a project with ODFW and EcoTrust to develop an online data dissemination tool. As these and additional data systems are brought online, we expect to be able to shorten the time needed to annually update data, and hope to use the increased efficiency to free existing staff time to develop additional types of data from our partners.

Another long-term theme related to expanding data coverage to estimates of productivity and/or data needed to calculate productivity. Initial investigations within our partner agencies indicated that these data are scattered, with some components like age composition of returning fish already being addressed by StreamNet, but others not yet covered. We will continue to determine how available these data are and investigate the feasibility of capturing the estimates and supporting data in the future.

Routine ongoing data development of the standard data sets in StreamNet continued this year. An update and new web page for disseminating Protected Areas data was completed. Initial work was done with the CRITFC to get ready to house and disseminate data developed by the Hatchery Scientific Review Group. All database, GIS and web server systems were maintained successfully, with repairs completed as needed. Software applications were developed or maintained, as needed. All required reports, budgets and equipment inventories were submitted.

The StreamNet website (www.streamnet.org), the project's primary means of disseminating fish data, was completely redesigned this year to improve the user experience and make locating and acquiring data simpler. A primary goal was to significantly reduce the sequence of steps needed. The new site was in final testing at the end of the fiscal year, and will go live in the first quarter of FY-09. Use of the website

remained strong, with 941,687 total page views representing 345,855 visits from 123,684 unique visitors. There were 18,797 actual views of tabular datasets from the online query system, plus many interactive map views, not counting downloads of the entire database direct data and information requests.

Significant preparatory work was done to redesign the database query system to improve functionality and speed. We were able to obtain valuable input on functionality of the existing query system and suggestions for needed improvements from system users. One particularly effective source of guidance was from attendees at the joint Oregon Chapter/Western Division, American Fisheries Society meeting held in Portland this year, where we demonstrated the existing system and used a questionnaire to record users' observations and suggestions (ftp://ftp.streamnet.org/pub/streamnet/projman_files/Report_on_website_use_from_WDAFS-Final.pdf). Redevelopment of the query system based on this accumulated input will begin as soon as the new website is up and functional in FY-09.

Contacts were made with several groups working with different species to discuss their data management needs, with the hope of ultimately being able to disseminate the resulting data through StreamNet. These were groups working with amphibians, lamprey, green sturgeon, and several subspecies of cutthroat trout. While most of these efforts are still being planned, we did begin collaboration with a PSMFC project funded to develop a database for a status assessment of coastal cutthroat trout. Some StreamNet staff time at PSMFC was also spent on a contract to evaluate database systems for rotary screw trap data in the Central Valley, California, which will begin in FY-09. We expect that experience gained through that separate project will be helpful in developing a system to disseminate smolt trap data from the Northwest through StreamNet.

The project remained active in cooperating with various regional scale collaborations, including ongoing involvement with NED, PNAMP and CBFWA. Several project participants also participated in the initial meeting and follow up conference call with the Executive Data Summit, which we hope will succeed in outlining regional scale data needs and provide guidance on a regional data management framework.

The largest obstacle encountered during the year was the need to reduce staff time as a result of five years of level funding, as outlined in the statement of work. In the Washington StreamNet project, this resulted in loss of a data technician to work on data development in eastern Washington, and data were obtained only from Washington's lower Columbia subbasins. In the Oregon StreamNet project, the approach to obtaining data was switched to focus on all data for designated focal species on a subbasin by subbasin basis to support the SOTR report. However, data technician time was reduced, resulting in an inability to develop other data, besides those for SOTR focal species, from all subbasins. Late in the fiscal year, one project participant indicated that on a one-time basis they had covered some of their work on other funding, leaving funding available for other work by the rest of the project. Since there was little time remaining, a rescheduling request was presented to the Budget Oversight Group, and in FY-09 we will be able to pick up additional temporary data technicians to capture and update data from those areas missed in FY-08, although that will not address the long term staffing issue.

StreamNet remains committed to serving the broad needs for fish data from the management agencies at the regional scale and to providing data related services and system development expertise to state and tribal fisheries management agencies. We look forward to future guidance on priorities from the regional executives.

Introduction

This report describes work accomplished by the StreamNet Project, Project No. 198810804, during Fiscal Year 2008 (FY-08) from October 1, 2007 through September 30, 2008. Details about the work done to accomplish the Milestones are summarized and reported at the Work Element Title level. WE Titles and Milestones are described in the 2008 Work Statement (ftp://ftp.streamnet.org/pub/streamnet/projman_files/Revised%202007%20StreamNet%20Work%20Statement.pdf).

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, 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.

Organization of the StreamNet projects will change in FY-09 as a result of the Columbia Basin Accords, signed this year. Under the Accords, CRITFC will contract directly with BPA for its work on the StreamNet project, including operation of the StreamNet Library. No functional changes in the relationship are anticipated, and the new approach and funding should increase support for compiling tribal data.

Work priorities for FY-08 included maintaining and updating existing long term data sets, managing the infrastructure necessary to maintain and deliver data, maintaining the StreamNet Library, providing data services to regional entities associated with the Fish and Wildlife Program, and project administration. The primary focus for updating data sets in the StreamNet database was placed on the data needed to support status assessments of focal species in the Status of the Resource (SOTR) report produced annually by the Columbia Basin Fish and Wildlife Authority (CBFWA). We initiated efforts to determine the availability of fish productivity estimates and related supporting data to calculate productivity within the partner agencies. Emphasis was increased on supporting development of data management systems within the partner agencies to speed data flow and simplify conversion of data to the common data exchange format. The amount of available staff time has eroded over five years of level funding, which resulted in some data not being updated this year, particularly in Washington and Oregon. While most data to support the SOTR were obtained, some other data sets in eastern Washington and several individual subbasins in Oregon were not updated this year. We were able to reprogram unspent funds from one state to FY-09 to hire additional temporary data technicians to update those incomplete data sets next year.

Summary of Accomplishments

Activities in FY-08 included routine development, maintenance, updating and posting of various data sets; QA reviews of data; administration of the computer systems (hardware and software) necessary for project operations; data dissemination via the online data query system, interactive map applications and customized delivery; coordination with related projects and regional entities; and operation of the StreamNet Library, in addition to routine administrative activities to maintain project functions. Significant emphasis was expended on assisting partner agencies with development of database systems that will in the future allow automated conversion of data to the StreamNet Data Exchange Format (DEF) as well as consolidate internal data management within the agencies. The DEF is the agreed on common standard that allows the consolidation of data in StreamNet so that the data can be used and analyzed seamlessly. An overview of project accomplishments is presented below, by major Work Element, with more specific details later in the detailed section of the report.

Work Element 159: Transfer/Consolidate Regionally Standardized Data

Data development this year was prioritized on data needed to support the SOTR report. Then, further work was directed at updating the data sets normally included in the StreamNet database. The Protected Areas data were updated with all supporting data and a new web page for these newly popular data was developed. Initial attempts to locate estimates of and raw data supporting fish productivity began in several partner agencies. Specific data development accomplishments by the StreamNet partners this year are summarized below.

The Columbia River Inter-Tribal Fish Commission (CRITFC) StreamNet project has been working on XML standard data exchange formats to more easily share data across agencies, especially tribal agencies. Specifically, CRITFC targeted the acquisition and dissemination of fish age data as a pilot for the new format. In addition, the library began exploring standards for submitting reference documents as electronic files rather than physical copies.

The Fish and Wildlife Service (FWS) StreamNet project successfully delivered its scheduled data updates for the national fish hatcheries.

Idaho StreamNet did not submit updates to fish distributions in Idaho during FY-08, instead focusing on data quality control of these data. We reviewed and, if necessary corrected, the locations of stream surveys that are used to inform our fish distributions. The 2003-2006 fall Chinook salmon, 2003-2005 sockeye salmon and 2007 spring/summer Chinook salmon redd counts were updated and submitted to the StreamNet database. Automatic extraction of StreamNet data from the IDFG databases was tested this year. Pilot extractions for redd counts, hatchery returns, hatchery fraction, and size, sex and age composition all successfully put IDFG data into the StreamNet data exchange format without waiting for reports and re-keying data. These pilots identified a number of data issues to resolve in the IDFG databases before automated data delivery can become routine. IDFG Fisheries personnel want hatchery fraction and size, sex and age composition to be submitted using the results of a post-run "mixture analysis", rather than using the raw data. IDFG Fisheries personnel determined that the KeyDate field in the Stream hatchery return data exchange format was misleading and wants to use the date each trap was installed for this field. Unfortunately, IDFG has not recorded this information in their databases. StreamNet personnel will capture trap installation dates from existing reports

and resubmit the hatchery return data. Meanwhile, IDFG databases will be modified to include trap installation and operation information. New StreamNet library references were created for the IDFG databases. Sixteen new streams were added to the StreamNet hydrography in response to requests by IDFG biologists. Using non-StreamNet funds, IDFG started to develop tools to migrate the PNW LLID hydrography to the 1:24,000 scale National Hydrography Dataset (NHD). The Idaho General Parr Monitoring data were posted to the StreamNet Data Store.

Montana StreamNet staff successfully contacted all MFWP, other state agency and federal fisheries biologists in 2008 to obtain fisheries field survey data collected during the 2007 field season. Staff updated and/or corrected resident fish distribution for all species from data gathered during the site visits; from reports or documents, genetic results or changes occurring from habitat restoration projects. These updates concluded with 411 "Fish Pres" records being exchanged. The Montana Natural Resource Information System (NRIS) became the steward of the NHD layers in FY-06; they anticipate the 24k NHD for Montana will be ready for use in 2 years. MFWP StreamNet staff obtained 243 reference documents from data developed during FY-08 and provided a total of 1,154 references to the StreamNet Library and Regional Staff.

Oregon StreamNet met nearly all of its Statement of Work requirements during this fiscal year. Exceptions were related to data not becoming available, prolonged vacancies and/or shifting priorities. Marine and coho-related harvest data records remained stagnant because of limited staff time. Data delivered or made available to StreamNet included anadromous and resident fish distribution, barriers, freshwater harvest information, age, and 1,131 new, updated and/or corrected abundance trends. Eighty-seven reference documents were submitted to the StreamNet Library related to these data submissions. Pilot efforts related to hatchery fraction, and size and sex composition data were conducted this year. 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. An updated draft statewide redband trout distribution dataset was created, and other resident distribution layers were migrated to the 24k Framework hydrography. Clean-up of the lakes / reservoir dataset was completed and metadata was developed, and these were submitted to regional StreamNet. We also submitted a comprehensive waterbody dataset for the state of Oregon including wide streams, estuaries, glaciers, etc.

PSMFC data development work at the regional office included the hydrography used to georeference data in the StreamNet database, updating delivery of Protected Areas data, and managing the Data Store, which houses static data sets and data sets from projects outside of StreamNet or that don't conform to the StreamNet Data Exchange Format (DEF). We made significant progress toward developing a "mixed scale" hydrography that includes all streams at the 1:100,000 map scale, all named streams at the 1:24,000 map scale, plus all unnamed streams that have StreamNet data tied to them. This is intended as an interim means of georeferencing data in StreamNet until there is a stable, regional-scale, whole stream routed 1:24,000 hydrography available for our use. The mixed scale hydrography will be implemented in the first quarter of FY-09. The regional Data Store was maintained, with eight data sets added/updated, including IDFG's General Parr Monitoring data, WDFW's resident fish assessment above Chief Joseph Dam, the 2001 subbasin plans with related data sets, and updated Protected Areas data and support materials. A new consolidated web page was developed for the newly popular Protected Areas data set.

Washington StreamNet staff updated all WDFW steelhead trends and delivered Hatchery Return data to 2006 for the 10 facilities in the Washington Lower Columbia River. We compiled and exchanged WDFW spawning ground survey geo-referenced data to 2007, including additional historical data. The historical data update included two comprehensive, geo-referenced data sets for steelhead, bull trout, and Chinook spawning ground survey data from the Walla Walla basin. Age data and fish distribution data for the Mixed Scale Hydrography dataset was submitted to the Regional StreamNet database. With WDFW staff, we examined smolt trap and spawning ground raw data and collection methods for integration into the H2WS work schedule database. This project, related to productivity estimation, is still in the scoping phase.

Work Element 160, Create/Manage/Maintain Database

The database management work element includes the behind-the-scenes work to maintain and manage the database systems (hardware and software) that store and deliver data through StreamNet, which all partners performed successfully. The Data Exchange Format was largely stable this year, but some initial work on potential new data types was performed. A major application development effort with IDFG is becoming operational.

The CRITFC and its member tribes are enhancing and expanding their data management activities under several other contracts under the Columbia Basin Accords. These new projects will incorporate regional data management standards and recommendations developed by the StreamNet Project and other inter-agency regional data coordination work groups. Existing databases for CRITFC data and the StreamNet Library were maintained. The new open source Koha library catalog software was fully implemented.

Idaho StreamNet conducted regular system administration tasks, including backups and software updates. IDFG implemented an Extranet architecture, which allows controlled access for our partners to internal data systems. StreamNet assisted in that effort and began to develop tools to streamline the exchange of data with StreamNet and other partners. StreamNet has been a partner with IDFG in developing fisheries databases and applications that will directly feed the StreamNet database. We were the lead in updating an existing Spawning Ground Survey (SGS) database application and also led in developing a Protocol Manager (PM). Fashioned around similar efforts by PNAMP and ISEMP, the IDFG Protocol Manager will directly link metadata with IDFG fisheries databases. StreamNet also has a leadership role in the development of a Hatchery Data Management System (HDMS) funded by the Lower Snake River Compensation Program and the Standard Stream Survey (SSS) and Lakes and Reservoirs (L&R) databases funded by federal aid money. The updated SGS and PM applications should be implemented for the 2009 salmon returns. The HDMS has already implemented the adult trapping and spawning modules. They were successfully used by IDFG hatcheries this year, plus the USFWS Dworshak National Fish Hatchery and the Nez Perce Tribe. The SSS application has been implemented for a couple of years now and historic data is nearly completely entered. The L&R application has just been released and will be used to enter this past year's lake surveys.

In Montana, most system administration was carried out by MFWP Information Services Division, except Montana StreamNet performed systems administration for its GIS and MFISH databases. Fisheries GIS layers were updated for the new FWP Mapper, exposing over 120 data layers to FWP staff, along with a variety of tools to view, analyze and print the data. Updated layers included genetics, fish distribution, fish survey location and data, private ponds, barriers and dams. A geodatabase for fisheries GIS layers and a query system were built to interface with the MFISH database encouraging creation of event themes for crucial GIS data sets.

Oregon 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. Hardware failures plagued the project throughout the year. This is a result of not having the resources to replace equipment on a regular rotation schedule. All or part of the production server environment will have to be replaced for data development and dissemination to continue. Open source software to increase functionality while reducing cost was evaluated during the year. We continued development and management of geodatabases to manage GIS data. And, we participated in SuperTrend and Sighting data DEF discussions and drew attention to the need for a juvenile abundance DEF.

PSMFC maintained and updated hardware and software, and assisted CRITFC with its library software. We developed initial templates for field capture of smolt trap and spawning ground survey data with WDFW. A new approach to building a database for these data was based on a documented occurrence ("sightings") basis, which is based on the Global Biodiversity Information Facility's database structure that will allow two way data sharing. We progressed on developing an online approach for submitting data sets to the Data Store using the FGDC Biological Data Format and a newly defined XML schema. Tests of the system were successful, and it will be implemented in FY-09. Data submitted to the StreamNet database were QA checked, and errors were referred back to the compilers for correction and re-submittal. All data passing QC were loaded into the database. Procedures for exchanging information on documents with the StreamNet library were improved by standardizing the exchange protocol. Staging tables were added to the database to facilitate conversion of georeferencing of all data in StreamNet to the new mixed scale hydrography. Improved descriptions of time series "trends" were implemented. The Data Exchange Format has been stable for several years, but we initiated development of a new concept to allow a new means to relate time series data, to be completed in FY-09. This approach is essential to being able to store and relate data generated from sampling using the EMAP GRTS approach. And, work is underway to explore use of the "sightings" approach for capturing data that is independent of the trend approach currently being used.

Washington StreamNet performed routine database management throughout the year. Computer systems were updated where necessary and backup capability improved as needed. Staff shortages in our GIS section pressed other staff into learning the structure of our resident fish data database so they could update this spatial dataset. Washington StreamNet staff researched and added a new data field designed to show users which records are based on surveys, judgments, or other criteria. We also reviewed existing and future data categories to direct new SuperCodes within the StreamNet Data Exchange Format (DEF). Finally, WDFW StreamNet staff worked on developing a statewide smolt-trapping database.

Work Element 161, Disseminate Raw/Summary Data and Results

The primary means of data dissemination by StreamNet remained the Internet at www.streamnet.org, which includes the tabular data query system, interactive map interfaces, File Transfer Protocol (FTP), and the Data Store, which is a searchable archive of data sets that don't fit the StreamNet DEF or that come from other projects besides StreamNet. Metadata for StreamNet's data are published as web services, making them findable through clearing houses and portals. A web service in XML was also established to feed data to CBFWA to automate updating the SOTR report. A major redesign of the project website was initiated and was in final

testing at the end of the fiscal year. This will greatly simplify and speed use of the online data systems when it goes live in early FY-09. The regional project at PSMFC and the partner projects also responded to 1,569 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 2008, by StreamNet partner and by type of organization making the request.

| Request from | CRITFC | IDFG | MFWP | ODFW | WDFW | PSMFC |
|--|--------|------|------|------|------|-------|
| College/university | 84 | 3 | 2 | 7 | 2 | 6 |
| Government, federal | 67 | 27 | 5 | 13 | 3 | 7 |
| Government, state | 72 | 67 | 59 | 148 | 13 | 5 |
| Government, tribal/ Tribal organization | 464 | 8 | 0 | 3 | 0 | 3 |
| Government, county/local | 10 | 1 | 3 | 6 | 0 | 0 |
| Nonprofit | 14 | 9 | 2 | 8 | 0 | 3 |
| Industry / commercial | 23 | 9 | 0 | 6 | 1 | 0 |
| Private consultant | 69 | 62 | 3 | 9 | 1 | 7 |
| Regional entity | 45 | 0 | 2 | 1 | 0 | 1 |
| Watershed council/group | 2 | 0 | 0 | 2 | 0 | 0 |
| General public | 71 | 0 | 2 | 15 | 0 | 7 |
| Unknown | 97 | 6 | 1 | 2 | 0 | 1 |
| Total | 1,018 | 192 | 79 | 220 | 20 | 40 |

Table 2. Information requests served in FY 2008 by StreamNet partner and by type of request.

| Request type | CRITFC | IDFG | MFWP | ODFW | WDFW | PSMFC |
|---|--------|------|------|------|------|-------|
| Citing StreamNet / permission | 0 | 0 | 0 | 0 | 0 | 3 |
| Data request | 0 | 156 | 16 | 13 | 12 | 5 |
| General fish information | 0 | 0 | 2 | 2 | 1 | 4 |
| GIS data / map | 0 | 20 | 37 | 113 | 7 | 12 |
| Hardware / software technical support | 0 | 14 | 2 | 51 | 0 | 1 |
| Help finding information | 0 | 0 | 3 | 15 | 0 | 8 |
| Help with data interpretation / analysis | 0 | 0 | 4 | 8 | 0 | 0 |
| Help with data structure | 0 | 0 | 2 | 2 | 0 | 2 |
| Report error or problem | 0 | 0 | 0 | 0 | 0 | 2 |
| Library / documents | 1,018 | 2 | 3 | 5 | 0 | 0 |
| Information outside StreamNet's scope | 0 | 0 | 1 | 4 | 0 | 0 |
| Other | 0 | 0 | 9 | 7 | 0 | 3 |
| Total | 1,018 | 192 | 79 | 220 | 20 | 40 |

Table 3. Outcome of information requests received in FY 2008 by StreamNet partners.

| Outcome | CRITFC | IDFG | MFWP | ODFW | WDFW | PSMFC |
|--|--------|------|------|------|------|-------|
| Could only refer to other | 0 | 0 | 0 | 27 | 0 | 1 |
| Request fully satisfied | 1,018 | 192 | 72 | 158 | 18 | 30 |
| Request partially satisfied (may include referral to other source of info) | 0 | 0 | 7 | 22 | 2 | 9 |
| Could not help at all | 0 | 0 | 0 | 12 | 0 | 0 |
| Response pending | 0 | 0 | 0 | 1 | 0 | 0 |
| Total | 1,018 | 192 | 79 | 220 | 20 | 40 |

The StreamNet Library at CRITFC responded directly to over 1,000 requests for information. Documents were digitized on demand for customers throughout the Pacific Northwest. This was in addition to documents located and downloaded from the library website. The library maintained regular business hours and the library website to provide access for patrons.

FWS StreamNet performed scheduled data exchanges so that FWS hatchery related data became available through the StreamNet website.

Idaho StreamNet used the StreamNet web site on a regular basis to query data and help others to use the web site to query for data they were looking for. We also provided input to the redesign of the StreamNet web site. Idaho StreamNet provided responses to 192 data requests that came directly to IDFG. 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 on request.

Montana StreamNet data were disseminated through the regional StreamNet database and the MFISH (external) and inFISH (internal) websites. A new version of MFISH will be completed in FY-09. 79 direct fisheries related information requests for maps, data or web content were addressed during the year in addition to data obtained through the websites.

Montana StreamNet developed a new internal web application, inFISH, to query MT StreamNet data and demonstrated it at the Fisheries Division Annual Meeting. MFWP Application Development resources were used. We deployed modifications to the mapping service associated with the Montana Fishing Guide, also with MFWP resources. InFISH was then modified to update the web-based MFISH application, which will be completed in FY-09. 79 fisheries related internal requests for maps, data or web content were completed this year. Data provided via the FWP website, including fisheries data, are not tracked.

Oregon StreamNet provided input to the StreamNet website redesign effort based on ongoing review of the current website. We managed ODFW websites and interactive map applications to improve agency data flow to users and to StreamNet. We enhanced data access by providing Sensitive Species map services to ODFW GIS users. Ongoing staff vacancies this year continued to prevent us from tracking web usage statistics. During the year we responded to 220 direct information requests.

Regional StreamNet at PSMFC continued to host, maintain and update the StreamNet website (www.streamnet.org). This year we redesigned the website to improve data dissemination and general usability, in final review at the end of the fiscal year with deployment planned in December. The new site will make it easier to find data, and simplify and shorten the process for locating and downloading data. Functionality of the existing site was improved by making more files and data sets searchable online. A new web service was established to allow automated transfer of data to CBFWA for their Status of the Resource report. We are making greater use of web services to serve out data and maps to users and to portals, and at present all data in the StreamNet database and Data Store can be located through online clearinghouses and portal such as NBII, Geospatial One Stop and the NED Portal. And, the dissemination of Protected Areas data was enhanced in response to increased demand for this information

Use of the StreamNet website for accessing data remained strong. A total of 123,684 unique individuals (individual IP addresses) accessed the website and viewed 18,797 data query final results, while a total of 10,619 unique individuals made over 27,000 interactive map visits (Table 4). A wide variety of agencies and individuals used the website (Table 5). The largest category of users was unidentified Internet Server Providers (ISP), which represented individuals and/or remote offices not on agency networks.

Table 4. Use of the StreamNet website (www.streamnet.org) during FY 2008.

| Main website and tabular data query system | | Interactive Map Applications | |
|--|---------|---|---------|
| Category | # Pages | Category | # Pages |
| Web Site Page Requests | 941,687 | Overall Map Server Page Requests ^a | 405,759 |
| Number of Visits | 345,855 | Number of Visits (Map Server) | 27,080 |
| Unique Visitors | 123,684 | Unique Visitors (Map Server) | 10,619 |
| Data Query Page Requests | 93,943 | | |
| Unique Query Sessions | 12,005 | | |
| Data Reports Viewed | 18,797 | | |

^a Includes all individual views as a user maneuvers or zooms on the map,

Table 5. Most frequent users of the StreamNet website (www.streamnet.org) during FY 2008, in decreasing order of usage (partial list).

| | Website user | | Website user |
|----|---|----|----------------|
| 1 | Internet Service Providers (e.g. rr.com, Comcast, aol, plus hundreds of others) | 11 | usgs.gov |
| 2 | Unresolved IP Addresses (these could include agencies as well as individuals) | 12 | state.id.us |
| 3 | oregonstate.edu | 13 | mt.gov |
| 4 | esri.com | 14 | washington.edu |
| 5 | odot.state.or.us | 15 | maine.edu |
| 6 | blm.gov | 16 | ecology.wa.gov |
| 7 | usace.army.mil | 17 | epa.gov |
| 8 | usda.gov | 18 | fs.fed.us |
| 9 | bpa.gov | 19 | Many others |
| 10 | dfw.state.or | | |

Washington StreamNet staff responded to approximately 20 direct requests for StreamNet Data this year. These included a comprehensive fulfilling of a region-wide Chinook data request and requests for coho data from Cedar Creek, Chinook harvest data for the University of Idaho, survey location information, East Fork Lewis presence/ absence data, smolt trap data and spawning ground survey data, among others. StreamNet staff within WDFW regularly participated in reviewing the StreamNet website, commenting on and suggesting improvements to design elements with intent to improve both data accessibility and user experience.

Work Element 189, Regional Coordination

The CRITFC Project Manager put out significant effort to work with other agencies to develop relationships and assist with data development throughout the region. Member tribes will expand their data management activities as part of the Columbia Basin Accords. CRITFC put forth effort on non-StreamNet funding to work with the HSRG on capturing hatchery review data, which will ultimately be made available through the StreamNet website.

The IDFG StreamNet project coordinator participated as IDFG's representative in the Executive Data Summit. He also participated in the Columbia Basin Fish and Wildlife Authority's Data Management Framework Subcommittee. StreamNet worked closely with the IDFG Columbia River Policy Coordinator to develop and submit proposed amendments to the Fish and Wildlife Program. We also participated in meetings with PNAMP and ISEMP in their efforts to develop regional data sharing protocols. StreamNet personnel coordinated with IDFG and partner agencies to develop a statewide information system of fisheries data. In particular, we worked with the Nez Perce Tribe and the US Fish and Wildlife Service in the development of a regional Hatchery Data Management System and Spawning Ground Survey. IDFG has been assigned the lead role in the current Westslope Cutthroat Trout Status Assessment Update. Although funded by non-StreamNet funds, StreamNet is playing a key role in providing technical assistance and data management support in the effort. Such status assessments have proven to be important sources of information for StreamNet

MFWP StreamNet Project Manager participated in discussions with state agencies, the governor's staff and NWPCC staff in creating a Montana Restoration Database; as a result, a position was created during the last legislative session to coordinate restoration projects at the state level. MFWP StreamNet staff contributed to the Data Management Framework Subcommittee discussion led by CBFWA and participated in the CBFWA Resident Fish Committee. Meetings were held with Fisheries Division staff during FY-08 to discuss the Division's Management Plan that has been renamed Fish Management Status Report; work will continue in FY-09. A meeting was held in September between StreamNet staff and FWP Fisheries Division staff to discuss the FY-09 SOW.

Oregon StreamNet placed considerable focus on supporting CBFWA's SOTR report this year. Oregon StreamNet and ODFW executive staff attended the PNAMP/NED/PNW-RGIC Executive Data Summit and conference call meetings, and reviewed and commented on data management recommendations. Increased effort to obtain tribal and non-ODFW data resulted in a number of new datasets being added to StreamNet holdings. This success partly resulted from our effort to contact Oregon tribes to assess their data holdings and interest in sharing information through StreamNet. The planned ODFW Data Summit was put on hold by ODFW management due to competing higher priorities.

Regional StreamNet coordination this year included continued involvement with NED, PNAMP, and CBFWA, plus participation in a meeting of the Washington Governor's Monitoring Forum. A primary focus this year was service to the Status of the Resource report by assigning population designations to certain types of data and automating data flow to CBFWA. Subbasin planning data were archived and made searchable, plus efforts to capture data from the Hatchery Scientific Review Group were initiated in conjunction with CRITFC. We coordinated with several of the cutthroat trout assessment efforts, and initiated direct participation in a coastal cutthroat trout assessment effort under non-BPA funding. We also initiated a project to evaluate rotary screw trap projects in the Central Valley of California on non-BPA funding to assess the data management approaches being used. Initial contacts were made with groups working with amphibians, green sturgeon and lampreys in order to help with data compilation and sharing and ultimately to include data in the StreamNet database. And, we pursued increased support to our partner agencies for enhancing their data management capabilities that, in addition to serving their needs, will increase efficiency of standardizing and transferring data to StreamNet.

Washington StreamNet representatives participated in several regional data meetings, including the WA Governor's Forum on Monitoring, PNAMP, the Executive Data Summit, Northwest Indian Fisheries Commission (NWIFC) and other Washington natural resource agencies regarding the development of common hydrography layers.

Work Element 99, Outreach and Education

Outreach for the StreamNet project is primarily directed at professional organizations, including fisheries/ecological groups and library science. While this is generally a minor activity in terms of time expended, it is often quite valuable for publicizing the project's capabilities and available data and for developing additional contacts for acquiring data to add to the database. A key professional meeting this year was the joint meeting of the Oregon Chapter and Western Division of the American Fisheries Society (AFS), which fortuitously held its meeting in Portland, OR, in May, 2008. We were able to use the meeting to demonstrate project website capabilities and to solicit input on our functionality and identify potential improvements. These results will be critical to our redesign of the data query systems during FY-09.

The StreamNet Library staff sought out opportunities to bring information to the public through various conferences and public festivals throughout the year. The Regional Librarian helped coordinate the First Annual Salmon Creek Walkabout with the Salmon Creek Watershed Council. Staff also participated in the Sturgeon Festival and Oxbow Salmon Festival. Library staff maintained active involvement with several library related professional groups.

Montana StreamNet staff conducted numerous outreach sessions with FWP employees on the inFISH application, including how the site functions and what information is available.

Oregon StreamNet staff participated in various meetings and forums to explain the project's capabilities and purpose and to generate support and additional data sources and resources.

Regional StreamNet outreach involvement included publication of two project newsletters. Several staff members participated in the joint meeting of the Oregon Chapter and Western Division AFS, where we were able to demonstrate the StreamNet website and obtain significant input on how to approach improving the site and the query system. The project biologist

participated in a meeting of amphibian specialists, and the project manager participated in the Western Oregon Lamprey Workshop, and two staff members participated in a green sturgeon workshop. In all of these cases, our participation focused on means to manage data effectively to support group needs and potentially to share data.

WDFW StreamNet staff attended several PNAMP meetings concerning regional data sharing and also attended and made presentations on various fish data systems still in development before the Washington Governor's Forum on monitoring.

Work Element 119, Manage and Administer Projects

All project partners contributed to technical guidance to the project through their participation in four quarterly meetings of the StreamNet Steering Committee. All partners managed their respective portions of the project throughout the year, including budgeting, expenditure tracking, personnel management, and reporting. Other related activities included:

CRITFC, as part of the Columbia Basin Accords signed with BPA, had its funding for the StreamNet Library moved from the main StreamNet contract through PSMFC to a separate contract directly between CRITFC and BPA. While this changes the funding and reporting channels, there will be no change in the functional relationship between the now-separate projects. This change will become effective in FY-09.

IDFG StreamNet accomplished some of its planned work on other funding sources, which provided funding that was ultimately rescheduled to FY-09 to hire temporary data technicians to fill data gaps in Washington and Oregon from FY-08.

Oregon StreamNet filled a long-vacant application developer position this year, but the selected candidate resigned for another position after only six months, while a second application developer position remained vacant throughout the year due to lack of funding. The Data Technician also resigned in the 4th quarter of the year. The timing of these resignations prevented refilling before the year ended. A contract programmer was able to cover a small amount of the workload, but some planned work was delayed by these ongoing vacancies.

WDFW StreamNet staff was successful in administering the level funded budget and operating to successfully complete all work elements within those guidelines. Unfortunately, with reduced staffing we were unable to acquire all data updates in the mid Columbia subbasins in eastern Washington, as stated in the work statement. We hired a replacement for the vacant Lead GIS data manager position, with the intent of modernizing our geographic information data systems.

Work Element 132, Produce (Annual) Progress Report

The FY 2007 Annual Report was prepared with input from all project partners and submitted to BPA on schedule during the first quarter of the year.

Work Element 185, Produce Pisces Status Report

All required Status Reports were submitted through Pisces as scheduled.

Detailed Report of Accomplishments

Following are detailed descriptions of work accomplished during Fiscal Year 2008 by all project partners, summarized to the Work Element Title level. For summaries of work accomplishments by the Milestones, see the quarterly Status Reports in BPA's Pisces project tracking system.

Work Element: 159 Submit/Acquire Data

Work Element: 159 Submit/Acquire 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 for this Title During Fiscal Year 2008

MFWP MFWP StreamNet staff successfully contacted all MFWP, other state agency and federal fisheries biologists in early 2008 to obtain fisheries field survey data collected during the 2007 season. Data included fish distribution; use type; survey, inventory and monitoring of target species; reptiles and amphibians and nongame species. The corresponding MFISH tables were updated with the data collected from biologists and from documents, reports and electronic files. Staff also provided additional outreach consisting of training on the new inFISH application as well as the MFWP internal website, repository and fish library.

Work Element: 159 Submit/Acquire 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 for this Title During Fiscal Year 2008

IDFG No updates for anadromous fish distributions were submitted during FY-08. Instead, we reviewed and, if necessary, corrected the locations of 7,449 Idaho stream surveys in the Idaho Fish and Wildlife Information System's Standard Stream Survey database in preparation for future updates to the StreamNet anadromous and resident fish species generalized fish distributions. Specific accomplishments were: 1) the upper boundaries for fall Chinook in the Potlatch River were updated based on information provided by the US Fish and Wildlife Service and the Nez Perce Tribe and 2) the locations of 7,449 Idaho stream surveys were identified in the Idaho Fish and Wildlife Information System's Standard Stream Survey database in preparation for future updates.

ODFW Routine maintenance was performed all year as needed. We performed QA/QC on all Columbia basin anadromous distribution events that had been converted to the 24k hydrography, developed documentation, combined the data into species-specific tables, and submitted the data to Regional StreamNet. We began reconciling Lower Columbia data with ODFW monitoring project data. We updated upper Deschutes distribution where anadromous fish are expected to re-colonize upon completion of the passage project at the Pelton - Round Butte dam complex, and Hood River summer steelhead distribution and sought ODFW District staff review.

WDFW Staff re-submitted a modified Fish Distribution dataset for mixed scale hydrography (MSH) with the newly populated 'EndExtent' field and draft entries for the 'Basis' field.

Work Element: 159 Submit/Acquire 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 for this Title During Fiscal Year 2008

IDFG No updates for resident fish distributions were submitted during FY-08. Instead, we reviewed and, if necessary, corrected the locations of 7,449 Idaho stream surveys in the Idaho Fish and Wildlife Information System's Standard Stream Survey database in preparation for future updates to the StreamNet anadromous and resident fish species generalized fish distributions. Specific accomplishments were: 1) the upper boundaries for fall Chinook in the Potlatch River were updated based on information provided by the US Fish and Wildlife Service and the Nez Perce Tribe and 2) the locations of 7,449 Idaho stream surveys were identified in the Idaho Fish and Wildlife Information System's Standard Stream Survey database in preparation for future updates.

MFWP StreamNet staff updated and/or corrected resident fish distribution for all species from data gathered during the site visits and from reports or documents. Genetic results from the University of Montana Genetics Lab for cutthroat trout species and redband trout were also used to update fish distribution. Information from the habitat restoration projects data were used in determination of distributions. These updates concluded with 911 "Fish Pres" records being created or updated and exchanged to StreamNet. Montana StreamNet staff employed a short-term worker during the summer of 2008 to enter additional historic data into the MFISH database. MFWP also participated in the Yellowstone Cutthroat Trout 2008 Assessment update through map product preparation, participation in the meetings, modifying the existing database for data entry, entering the data and providing final review products back to the biologists who participated.

ODFW Existing data were maintained throughout the year. We created an updated (draft) statewide redband trout distribution dataset in response to a request from local District staff. Statewide bull trout and redband trout distribution and Willamette and John Day rainbow trout distribution were migrated to the 24k Framework hydrography. The closed basin redband distribution remains to be converted.

WDFW Because of staffing vacancies in our StreamNet GIS section, existing staff focused on learning the WDFW Resident Data system (ResDat). We were able to fill the Lead GIS position and existing and new staff focused on compiling and loading source 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 for this Title During Fiscal Year 2008

IDFG The 2003-2006 fall Chinook and 2003-2005 sockeye salmon redd counts were compiled and submitted to the StreamNet database. The 2007 Chinook redd count data were entered into the IDFG Spawning Ground Survey database. Using a database query of the IDFG Spawning Ground Survey database, the 2007 redd count data were converted to the StreamNet data exchange format and submitted to the regional StreamNet database, representing a successful test of automated conversion from the Idaho Fish and Wildlife Information System (IFWIS).

Although given a red light in PISCES, pilot extractions for size/sex composition and hatchery fraction were completed before the end of the contract year (9/30/2008). Because the PISCES 4th quarter report was due before the end of September, it was submitted before we completed all of our work for the year. We successfully pulled these data directly from the IDFG Spawning Ground Survey database and directly into the StreamNet data exchange format. These pilots identified several issues with the IDFG data. There was inconsistent use by IDFG of the origin and production fields. Also, there were inconsistencies in the units used to record fish length, which is used in the field to determine age. Rather than use the raw Spawning Ground Survey data, IDFG Fisheries staff want to submit the results of a post-run analysis called a "mixture analysis" for hatchery fraction and size/sex composition on the spawning grounds.

MFWP During the course of the year 18,638 fish survey records were added or updated in the MFISH database. These data were exchanged with the StreamNet database in August, 2008. The data provided including all fish surveys, including one time, index streams, lake netting and all other types.

ODFW Data compilation, trend updates, & QA/QC efforts for adult abundance trends continued throughout the year, with data supporting focal species in the SOTR obtained in all subbasins, although staff limitations prevented obtaining other abundance data from some subbasins, including the Powder, Burnt, Lower Columbia, and Willamette. No data search was conducted in the Lower Middle and Upper Middle Snake basins. Updates were submitted to Regional StreamNet in April and September, as scheduled, amounting to 1,131 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 1947 to 2008. The year's work brings the total number of Oregon abundance trends to 8,753 spanning the years 1938 through 2008.

We piloted hatchery fraction data compilation this year. We found that hatchery fraction data is reported for both spring Chinook and summer steelhead in the John Day subbasin. Hatchery fraction is usually reported in electronic format as a count of natural and hatchery fish, but is also displayed as a % natural and % hatchery fish reported in summarized reports. At this time there is no efficient way to compile hatchery fraction data, outside of what we already do (report hatchery and natural counts as separate trends). If % natural and % hatchery were to be reported, the EscData DEF would need to be modified. We continue to gather information from researchers about how hatchery fraction is used in productivity estimates.

Oregon also piloted development of size and sex composition data. These data are commonly collected with age data for many different species and in many subbasins, including summer steelhead in the John

Day subbasin. Sex composition is usually reported as the % of male and % of female carcasses recovered during spawning surveys. It is also reported as the number of males and females by age class. Most often sex composition (as a percentage) is summarized in reports, and less often counts of males and females are summarized in electronic format.

WDFW Washington StreamNet staff completed two data exchanges in the first quarter. The first updated all WDFW steelhead Trends and changed all remaining old PSMFC entered trends to WDFW trends, so that the old trends remaining in StreamNet's Regional database can be deleted. The second exchange involved only a few changes and additions to WDFW steelhead escapement data.

Compilers updated the WDFW Spawning Ground Survey (SGS) database with historical data, and updated it with all 2006 and 2007 surveys. Updates included 2 comprehensive, geo-referenced sets. The first consisted of 1998 - 2007 Steelhead, Bull Trout, and Chinook spawning ground survey data from the Walla Walla basin. The second consisted of 1984 - 2007 Summer Steelhead spawning ground survey data, also for the Walla Walla Basin. Geo-referenced bull trout, Chinook and steelhead data for the Okanogan, Methow and Twisp river systems was collected from various WDFW biologists. Due to funding limitations, compilation of this data was halted in the second quarter.

StreamNet regional staff began preparation for the natural spawner escapement data collection and compilation process, which involved generation of a data dictionary and entry of historical data from survey cards. Some effort was made toward compilation of Washington harvest data. Additional work was done in the creation of an escapement goal table for all Lower Columbia tributaries by species. This work was hampered by a lack of available data.

Work Element: 159 Submit/Acquire 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 2007. 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 for FY-08.

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

Project Accomplishments for this Title During Fiscal Year 2008

FWS Total return and egg take data through 2007 were transformed into StreamNet format using data supplied through USFWS funding. These data were exchanged with StreamNet.

IDFG The 2007 hatchery return data for Chinook salmon were entered into the IDFG adult trapping database, part of the Hatchery Data Management System (HDMS). StreamNet provided oversight of the review and verification of the historic trapping data in the HDMS.

Using an automated query of the IDFG HDMS, hatchery return data were extracted and converted into the StreamNet data exchange format. The data were submitted to the regional StreamNet database, approved by the StreamNet database manager and posted on the StreamNet web site. The final dispositions were incomplete because not all of the historic spawning data have been entered into the IDFG Hatchery Data Management System. These data were later withdrawn and removed from the StreamNet web site. In reviewing the data submittal, IDFG Fisheries staff members objected to the values in the KeyDate field in the StreamNet database. They insist this field must contain the date that each trap was installed, not the

date when the first fish was observed. That information has not been recorded in the IDFG HDMS. It will be added in FY-09. In the meantime, IDFG StreamNet personnel will compile that information directly from brood year reports, insert it into the data submittal and resubmit the data during the first few months of FY-09.

The pilot automated extract for age and size/sex composition were completed successfully, but as noted under the adult abundance Work Element Title, there were inconsistencies in the use of some fields and IDFG Fisheries staff would like to submit these data from the results of a "mixture analysis" that they conduct annually.

ODFW Hatchery return data were updated through 2008 from all hatcheries where data were available. Of 147 trends, 85 were updated through 2007, 5 were updated to between 2003 and 2006 because of lack of data, and 57 were not updated, primarily because there was no updated information. Providing missed data in FY-09 will depend on data becoming available and filling the vacant Application Developer position. Oregon submitted 361 return records and 2,655 disposition records. Egg-take information was included for most, but not all, return records. Efforts to refine the export process and acquire egg-take information will continue in FY-2009 when staff vacancies are filled.

WDFW Hatchery Returns for 2006 and QA/QC for the 10 facilities in the Washington Lower Columbia River were delivered and loaded into the master StreamNet database. Mixed-scale hydrography data representation was updated for these trends.

Work Element: 159 Submit/Acquire Data

Title: 6 Develop dam and fish passage facility data (mid-priority)

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. 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.

Project Accomplishments for this Title During Fiscal Year 2008

MFWP No updates or changes to dam facilities occurred during the year, therefore dam data were not exchanged in 2008.

Work Element: 159 Submit/Acquire Data

Title: 7 Develop hatchery facility data (key dataset, update once per year)

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. Data will be updated as necessary and exchanged to the regional database at PSMFC.

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 a three year rotating basis, beginning in 2007.

Project Accomplishments for this Title During Fiscal Year 2008

FWS Hatchery facility data was updated as needed, and exchanged with StreamNet.

MFWP Changes in hatchery permitting occurred in FY-08. This resulted in many historic private hatcheries being licensed as "commercial ponds". MFWP exchanged hatchery data to the StreamNet database for state and federal hatcheries only.

WDFW StreamNet compilers updated the internal corporate files and began researching the information data flow for hatchery administration changes (i.e. managers, etc) in hopes of improving and simplifying data flow. Staff continued work improving the representation of the hatchery related locations and internal information flow. Through this, a mixed scale hydrography version of the hatchery table for Washington WDFW and USFWS hatcheries was produced and submitted to the StreamNet regional database.

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-08 we will continue to maintain these data, but emphasis will shift 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 for this Title During Fiscal Year 2008

IDFG Throughout the year, IDFG fisheries biologists requested additional streams that they sampled during the year be added to the hydrography. These streams were routed, assigned an LLID and added to the IDFG databases. A total of 16 new streams were added to the 1:100,000 scale hydrography.

MFWP The Montana Natural Resource Information System became the steward of the NHD layers in FY-06 and began the process of quality checking the 1:24 K data and performing maintenance of the 1:100 K layers, excluding the stream routes which remain MFWP responsibility. Cooperation and coordination between MFWP and NRIS regarding the 24k hydrography took place throughout the year. To date, 79 out of 100 4th code HUCs have gone through the USGS editing process. NRIS envisions completing their portion of the project in December, 2008.

ODFW Routine maintenance was performed as needed and coordinated with Regional StreamNet staff throughout the year. We continued to evaluate Oregon distribution and barrier data affected by the integration of WDFW's mixed scale hydrography (MSH) dataset into the regional hydrography layer. Numerous edits were identified during the process of distribution and barrier data migration to the 24k hydrography. Stream routes were added or extended as necessary to enable mapping of 24k distribution and barrier data. Staff initiated coordination efforts to work with data stewards to edit the dataset in such a way that it complies with the standards.

Participation in efforts to enhance the regional 100k hydro dataset with 24k stream routes continued, including; attendance of Framework Hydrography Clearinghouse meetings, coordination with the Hydro Framework to store LLIDs alongside NHD routes, and development and testing a methodology for converting 100k event data to the 24k Framework hydrography. We worked with Regional StreamNet, WDFW, IDFG and CDFG to address cross-state hydrography anomalies focusing on location and accuracy of observation data occurring on the same streams, and the maintenance of whole stream identifiers while aligning with the National Hydrologic Dataset.

MSH datasets for numerous basins were developed and initial quality assurance reviews of the data were conducted. Subbasin level datasets were appended into a single hydrography dataset for the Oregon portion of the Columbia basin, and tributary-to information (name, ID and measure) and populated location type and subtype fields were developed. We also modified existing Framework hydrography and added new linework to serve as a template for ODFW fish passage barrier data. Data were adjusted, and Oregon's MSH was submitted to Regional StreamNet.

Clean-up of the lakes/reservoir dataset was completed and metadata was developed. These were submitted to regional StreamNet. We also submitted a comprehensive waterbody dataset for the state of Oregon including wide streams, estuaries, glaciers, etc.

WDFW Due to the pending mixed scale hydrography (MSH) adoption, WDFW StreamNet compilers converted and submitted the barriers and dams dataset to the MSH measures and codes.

Regional compilers created a tabular lookup table of the more comprehensive 24K hydrography. When complete, the biologists will use it to geo-reference new data to the proper stream. This process revealed some issues with the base hydrography, which were addressed.

Additional work involved the finalized the automated determinations of Left\Right Bank descriptions for the mixed scale hydrography. MSH codes and measures for ODFW and CRITFC data relevant to Washington were prepared and submitted to StreamNet central staff in order to coordinate with the relevant agencies.

To date, the Location Data Manager has submitted all MSH data for Washington except data for the trend table. Work toward this effort is continuous. All MSH submissions will be completed in early Q4.

WDFW regional StreamNet staff continued to test the Washington Framework and NHD tools. These compilers also submitted Use Cases to the Framework to demonstrate the need for geographic reference elements at the compiling level.

Work Element: 159 Submit/Acquire Data

Title: 9 Develop fish barrier data

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 with exchange targeted for FY-09. Some preliminary work may be done sooner, and some already compiled data may be exchanged.

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 as they become available, on 3 yr rotation beginning FY-09, or as available. New sources of barrier data are located.

Project Accomplishments for this Title During Fiscal Year 2008

MFWP There were no updates or edits to the barriers data in 2007. Culvert data from the Lolo National Forest still need to be incorporated into the MFISH database. Adam Petersen, a new employee hired in July 2008, will be tasked with updating all barrier and dam information in the future.

ODFW Work on Barrier data was impacted by ongoing work on the new mixed scale hydrography. Development of a comprehensive and functional hydrography dataset focused on converting data to the Framework hydrography, garnering support from funding and data partners, and hiring additional staff to perform the necessary data conversions. Additional funding partners were identified, allowing us hire additional staff to focus on the data migration effort. Barrier data were migrated to the new hydrography in the Willamette, lower Columbia, Deschutes, Malheur and Owyhee basins. We reconciled a list of priority Mid-Columbia recovery area fish passage barriers with the ODFW Barrier database. We also worked with biologists to update data as necessary. We incorporated barriers and developed additional barrier data for Mid- and Upper-Columbia subbasins.

Work Element: 159 Submit/Acquire 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 for this Title During Fiscal Year 2008

CRITFC CRITFC revised its salmon age database in FY-08, improving QA/QC checking, adding metadata, and improving data input applications. We developed and tested XML schema for sharing these data with partner agencies in the region. The next step will be to revise the data summarizing and reporting applications and publishing these reports to the Internet.

- FWS All available USFWS Age Composition information, collected and processed with USFWS funding, was transformed into the StreamNet DEF and exchanged with StreamNet.
- IDFG The experience with pilot extractions for age, size and sex composition in adult abundance and hatchery returns identified an inconsistent use of the jack and length fields in the IDFG databases. IDFG Fisheries personnel want to submit the results of an annual "mixture analysis" for these data types. Those data will be obtained by StreamNet in FY-09 and submitted to the regional StreamNet database.
- ODFW Age data were compiled, updated, and corrected for the John Day and Hood River subbasins. Age data were not obtained in other subbasins where they exist due to staff limitations. Oregon submitted 548 age data records to regional StreamNet. Of these, 165 were new records for spring Chinook in the John Day basin.
- WDFW WDFW age data were gathered and entered and submitted to the StreamNet central database for Washington lower Columbia River fall Chinook, spring Chinook and fall chum data.
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Work Element: 159 Submit/Acquire 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 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 for this Title During Fiscal Year 2008

CRITFC In FY-08, CRITFC began a process to review and standardize all its databases, applying the principles described in the Guide for Regional Data Collection, Sharing and Exchange developed by the StreamNet Steering Committee. These improvements will likely be completed in FY-09. Results will be made available through the Internet.

IDFG The 2000-2006 Idaho General Parr Monitoring data, a much requested data set by the ISRP and others, were posted on the StreamNet Data Store, where they can be searched for, located and downloaded.

MFWP MFWP StreamNet staff updated 315 genetic results and exchanged an Excel spreadsheet containing all genetic sample records for inclusion in the StreamNet Data Store.

ODFW No requests were received during this project period to post independent datasets from Oregon. Updates to data sets other than previously mentioned were submitted along with other scheduled data exchanges, including 17 updated/corrected freshwater harvest trends for the years 1977 - 2007. Spawner-recruit estimates were also corrected this year as needed. These were not called for in this year's SOW, but were obtained opportunistically and submitted.

Past efforts to acquire updated harvest information for more recent years were finally rewarded this year. However, these data were not incorporated into StreamNet due to inadequate staff time and resources. In addition, marine harvest updates and coho freshwater harvest data were not converted to the StreamNet exchange format due to lack of resources. This year's work brings the total number of Oregon harvest trends to 1,023, spanning the years 1938 through 2007.

Oregon StreamNet researched juvenile salmonid data in the John Day as to what is there and how it is used. Trends were created for juvenile rotary screw trap data in the John Day and for juvenile population estimates. As a result, 4 smolt abundance trends were submitted to StreamNet, and 5 juvenile abundance trends were created, but not submitted because of the lack of a current DEF for juvenile abundance data.

Region PSMFC GIS staff spent significant time developing Hydrography data, with primary focus on compiling the new "mixed scale" hydrography for use as the official data layer for georeferencing StreamNet's stream-based data. This included GIS data development, QA/QC and migration of all existing StreamNet data. StreamNet's new base hydrography will be released in conjunction with StreamNet's redesigned website in early FY-09. Once the mixed-scale hydrography layer is made public, the 1:100k PNW hydrography layer will be archived and will no longer be edited. The archived layer will continue to be available through StreamNet as it represents an important legacy dataset. Related to this effort, the StreamNet Regional GIS Specialist attended meetings with regional partners and contributed to planning efforts related to regional use of the National Hydrography Dataset (NHD) and the related "Watershed Boundary Dataset" (WBD). A consistent theme of our input to these meetings has been the importance of retaining a whole-stream identifier (such as LLID) to meet StreamNet's fish data reporting needs.

This year the Protected Areas list received the most significant development work since its last update in 1992. For the first time in at least 10 years, we heard from an increased number of people who were interested in using the Protected Areas list. We were also told that BPA and NPCC are receiving inquiries regarding the Protected Areas. There seems to be a renewed interest in hydropower development, likely due to higher energy prices. Work on the Protected Areas data completed this year included updating records as appropriate, and creating a spreadsheet of the most up to date data. All important documents available from NPCC were obtained, as were all Protected Areas references we could in the Federal Register. All these documents were captured in PDF format and optical character recognition performed on them to make them searchable. The documents were organized and posted on the StreamNet FTP site. We created a dedicated web page at <http://www.streamnet.org/protectedareas/index.html> that explains the Protected Areas and how to use the list and supporting documents. A pointer to the page from the Quicklist allows people to get to the Protected Areas page from any page on the web site. In addition, an entry was made in the Data Store; metadata for the Protected Areas were created and the list is now findable by searching the Data Store. Finally, the Protected Areas Mapper was updated to reflect the changes that were done this year.

Development of other data sets included addition or update of eight data sets to the Data Store. Major additions were IDFG's general parr monitoring data, WDFW's resident fish assessment above Chief Joseph Dam, the 2001 subbasin plans and related data sets, and the NPCC's Protected Areas list and supporting materials. We began collaboration with CRITFC to capture the data included in the hatchery program reviews conducted by the Hatchery Scientific Review Group.

WDFW 1998, 2002, 2005 and 2006 Steelhead spawning ground survey data were received from the Colville Confederated tribe for the Okanogan River, Similkameen River, Ninemile Creek, Tunk Creek, Bonaparte Creek, Omak Creek, and Tonasket Creek. Data and locations are awaiting review. Spring Chinook and steelhead spawning ground survey data from the Methow Basin were obtained from WDFW regional staff. A large set of carcass data was noted and is a candidate for conversion to StreamNet.

Work continues on Upper Yakima bull trout spawning ground survey data for 1984 - 2007. Locations were fixed using a GPS and a review of other GPS location data from other agencies and WDFW are currently being processed for accuracy.

Aerial spawning ground survey data 1948 - 2007 were obtained for main stem Columbia River Fall Chinook from Pacific Northwest National Laboratory. This data set was reviewed and further location information and data formatting is required from WDFW regional staff before conversion can proceed. In addition, fall and spring Chinook, and coho spawning ground survey data for the lower Yakima River, 1998 - 2006, were received from WDFW regional staff, however, the format was inconsistent with StreamNet requirements and the Olympia Data Compiler is awaiting revised data tables.

Additionally, WDFW began work on a statewide Smolt Database.

Work Element: 159 Submit/Acquire Data

Title: 12 **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 will submit reference documents for all data contained in the StreamNet database 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.

Project Accomplishments for this Title During Fiscal Year 2008

CRITFC The Library continues to collect materials on the Columbia Basin as per our mission statement. A Collection Development policy is currently under revision to more directly target our acquisitions for the collection. As with any library, the most difficult part is developing a weeding policy to keep the collections healthy and viable. During FY-08, the library renewed several journal subscriptions, but due to level-funding several subscriptions had to be dropped. Also during FY-08, participating agencies deposited reference documents with the library. These submissions help grow the collection. Montana was the largest submission with over 1,000 documents submitted in electronic format for addition to the electronic document repository.

FWS No new materials or references were sent to the library this year.

IDFG Two new references for fall Chinook redd counts, 5 new references for sockeye salmon redd counts and 1 new reference for the Idaho general parr monitoring data were submitted to the StreamNet database and library. Three new references for IDFG electronic database sources were developed and submitted for the IDFG hatchery returns, age composition and spawning ground survey databases.

MFWP MFWP StreamNet staff obtained 275 reference documents for data developed during FY-08 and provided these data to the StreamNet Library and Regional StreamNet Staff. In addition to the 275 references, an additional 879 digital documents and reference information were sent to the StreamNet Library in August, 2008.

ODFW Oregon StreamNet submitted 87 electronic reference documents to the StreamNet Library this year, related to data developed in WE 159. 69 were new to the StreamNet reference holdings.

Region PSMFC submitted documents to the StreamNet Library on an opportunistic basis throughout the year. Significant time was spent in improving the synchronization of the library collection database with the StreamNet online data query system and database.

WDFW Our staff submitted references to the library for all corresponding data exchanges.

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 for this Title During Fiscal Year 2008

- CRITFC** Library staff completed the conversion of all catalog records to the new integrated library management system (Koha). This system is being maintained as well as hosting the library catalog.
- FWS** FWS computer specialists maintained and updated all operating systems and hardware needed to support StreamNet activities.
- IDFG** Regular system administration tasks, including backups and software updates were conducted by StreamNet personnel. IDFG implemented an Extranet architecture this year, which allows controlled access for our partners to internal data systems. IDFG StreamNet assisted in that effort and we have begun to develop tools that will streamline the exchange of data with StreamNet and other partners.
- MFWP** Other than GIS, system administration duties have been moved to MFWP Information Services Division, Network Services Bureau, except for databases that are shared with the Montana Natural Heritage Program, which includes MFISH. To manage these remaining systems and data, a move was made from SQL Server Enterprise Manager to SQL Server Management Studio.
- ODFW** Oregon StreamNet performed system maintenance and upgraded hardware and software, as needed. We updated our Secure Sockets Layer certificate through 2010. Unfortunately, several hardware failures occurred during the year. Two of three external hard drives failed, preventing the production servers from coming back online following a power failure. Eventually, the third drive also failed, preventing access by the web server to all dynamic web content stored on the data server for a brief period of time. Backup issues prevented the upgrade of certain software and remained unresolved throughout the year. Because of the problems we experienced, effort went into developing contingency and restoration plans in the event of a catastrophic failure. No data were lost due to these difficulties.
- GIS staff upgraded to ArcGIS 9.3. Needed service packs were installed as necessary to ensure proper functionality. We installed the ArcMap server component to ArcIMS on the test map server, allowing testing of map services that use this particular ArcIMS functionality. GIS staff coordinated the purchase and/or transfer of ArcView and Spatial Analyst concurrent use licenses to enable more staff to utilize the software while sharing the cost. We also provided other GIS license support to several staff throughout the year. An additional service provided to ODFW staff was the evaluation of GIS-related software that fall outside the standard set of ESRI products to allow people to visualize their data and do some basic editing and analysis (e.g. Ramas GIS, uDig, Quantum GIS, gvSIG, and OpenJump). We continued to research and evaluate open source software options for creating web-based mapping applications in an effort to dynamically display spatial information while avoiding internal license restrictions that limit tools that allow this functionality. Geodatabase development and management continued during the year. Domains and relationship classes were maintained in order to ensure data integrity and ease of use. Development of topical white papers continued as a means of communicating how-to information to agency staff.
- Region** Routine systems maintenance continued for all StreamNet computer systems at PSMFC. Staff maintained and upgraded the StreamNet GIS infrastructure which operates on the latest version of ESRI software (ArcGIS Server and Desktop v9.3). The Windows Server 2003 x64 database server was maintained with security patches and service packs and experienced very few hours of down-time this project year. PSMFC staff assisted CRITFC in debugging the Koha library software that the StreamNet Library implemented for their database and web site. Problems with logging in and with several other functions were identified and subsequently corrected by CRITFC.
- WDFW** The WDFW StreamNet Location Data Manager received a new PC and upgraded to ArcGIS 9.2. The WDFW StreamNet Data Manager received a new computer and external hard drive. All data is backed up on the external hard drive and the WDFW server. An additional external hard drive was purchased in the second quarter to back up critical data used by the Olympia Data Compiler and Olympia Location Data Manager. Steps are being taken to prepare for agency wide operating system upgrades to Microsoft Vista and Office 2007 to be installed sometime in early FY-09.
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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 for this Title During Fiscal Year 2008

CRITFC New data entry and reporting routines were developed for legacy salmon databases. The QA/QC routines were strengthened in the data entry applications and metadata were included as routine input. XML applications were developed and tested for reporting Library catalog records and salmon age data to the StreamNet regional office.

FWS FWS CRiS programs and databases were maintained by both a StreamNet funded employee and FWS funded employees. Software was also enhanced during the year.

IDFG At IDFG, StreamNet works within the Idaho Fish and Wildlife Information Section of IDFG's Information Systems Bureau. As such, StreamNet is part of a coordinated effort to build robust fisheries data applications and databases. StreamNet has been the lead in updating an existing Spawning Ground Survey (SGS) database application. It also has taken the lead in developing a Protocol Manager (PM). Fashioned around similar efforts by PNAMP and ISEMP, the IDFG Protocol Manager will directly link metadata with IDFG fisheries databases. StreamNet also has a leadership role in the development of a complete Hatchery Data Management System (HDMS) funded by the Lower Snake River Compensation Program and the Standard Stream Survey (SSS) and Lakes and Reservoirs (L&R) databases at IDFG funded by federal aid money. Both the updated SGS and PM applications should be implemented for the 2009 salmon returns. The HDMS has already implemented the adult trapping and spawning modules. They were successfully used by all IDFG hatcheries this year, plus the USFWS Dworshak National Fish Hatchery and the Nez Perce Tribe. The SSS application has been implemented for a couple of years now and historic data is nearly completely entered. The L&R application has just been released and will be used to enter this past year's lake surveys.

Pilot efforts to extract StreamNet data exchanges directly from these databases were largely successful. In every case, the IDFG data were converted into the appropriate StreamNet data exchange format. However, several data content issues were identified that have to be resolved before automated, direct extraction to StreamNet and other partners can be fully implemented.

MFWP Both the public (MFISH) and internal (inFISH) web data delivery systems were worked on extensively this year. The internal inFISH site was released during the Fiscal year. The public site was worked on during the later part of the year and will be released in early FY-09. An enhancement schedule for MFISH and inFISH was developed in early FY-09 and provided to the programming staff within the Information Services Division.

ODFW Application and interface development and maintenance efforts continued to be hampered by vacancies in Oregon StreamNet's programmer positions. Development of an application to facilitate change requests to Fish Habitat Distribution data remains on hold. A contract programmer was retained, but his work primarily focused on a single application being funded by ODFW. A permanent programmer was hired for half the year. After getting up to speed, he worked on the most critical maintenance and development needs. This primarily consisted of enhancing existing applications and fixing bugs that cropped up over time. Before he resigned for another position, he was able to enhance the ODFW Data Clearinghouse with improved search features and backend management components, worked on reestablishing access to website use summary statistics, and developed a temporary approach to extract hatchery return data from ODFW's mainframe computer system.

The user interface for Oregon's Trend database was modified to accept trends in the 500K range as we have used up most of the 50K trend numbers, an internal data responsibility tracking issue. We added query functionality to some test layers in the Forestry Information and Reporting System/Forest Activity Notification System application.

Region PSMFC and WDFW staffs met to discuss WDFW's data capture and programming interface needs for smolt trap data and spawning ground survey data. WDFW provided PSMFC with field data sheets, from which PSMFC created a first draft interface (in an initial non-functional layout) for WDFW's review. This permitted WDFW field crews to provide input on what types of interface preferences they had and how data entry interfaces should look and function. This first draft was largely for WDFW's own use as an example to refer to as they design agency-wide data capture strategies. The draft interface and backend database created by PSMFC was based on the draft observations ("sightings") data structure developed at PSMFC for possible StreamNet use. This draft backend database, in turn, is based on the Global Biodiversity Information Facility's (GBIF) database structure, and is designed to allow two-way data sharing between local (WDFW, StreamNet) databases and the GBIF.

We also initiated a new approach for capturing data and descriptive information (metadata) for the Data Store. The previous approach to submitting data sets and metadata has two shortcomings. First, it does not meet standards for metadata as defined by the Federal Geographic Data Committee (FGDC) and National Biological Information Infrastructure in the Biological Data Profile of the FGDC standard (FGDC/BDF). Second, the program must be installed on a computer before it can be used, which is a problem for many agencies where application installation is restricted. For the past two fiscal years we had been waiting for a new national metadata standard to be adopted by FGDC before we replaced the current installable program with a web-based program. However the new national standard has repeatedly been delayed, so this fiscal year we proceeded with design of a web-based interface using the current FGDC/BDF standard. The FGDC/BDF was evaluated for our use, and two items we need were added to the FGDC/BDF using rules established by FGDC for modifying the standard. Thus we created a FGDC/BDF/StreamNet metadata standard which we will use for the Data Store. After this new metadata standard was defined an XML schema was created by modifying a FGDC/BDF profile schema provided by the US Forest Service. A test XML instance document was created and validated against the new standard. The successfully-validated XML instance document was then submitted to the Geospatial One-Stop and NBII portals to determine if they would be accepted and would be searchable from those web sites. These tests were successful. We subsequently designed the web-based metadata creation tool and created a backend database in MS SQL Server to house the metadata. The programming to implement this will be conducted during FY-09.

WDFW StreamNet staff worked on developing a statewide smolt-trapping database. Staff also worked on naming conventions for future porting of data to SQL Server and combining all WDFW StreamNet databases into one master data set. Other work was done on the WDFW master StreamNet database to display, manage and enter data from one master copy. Once the agency infrastructure has been completed the WDFW StreamNet staff can work from one master copy to avoid duplication and facilitate faster access to data. Finally, WDFW StreamNet staff continued work in the mixed scale hydrography cross-referencing effort, in which our primary cross-reference tables (PSC code geo-referencing system) were re-organized.

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.

- CRITFC** Staff continued submitting library and other data to the Region for inclusion in the StreamNet data tables. During FY-08, the library also initiated a complete inventory of all StreamNet References. As part of the switch to Koha, the inventory includes correcting and completing all records for StreamNet References. Work on this project will continue into FY-09.
- FWS** QA/QC was performed at both the CRiS and convert to StreamNet DEF levels this year.
- IDFG** The begin and end measures in general fish distribution data were updated this past year. Metadata for the anadromous and resident fish distribution data were updated and made available.
- MFWP** Databases were maintained by Montana StreamNet staff during the year. A geodatabase for fisheries GIS layers was built during the year. In addition to the geodatabase a query system was built that interfaces with the MFISH database. This ensures easy creation of event themes for crucial GIS data sets. During the year, new GIS layers were made available on the FWP Mapper for internal staff and a new public mapping application was developed to display information associated with the Montana Fishing Guide and MFISH. Training and outreach have continued on the FWP Mapper and inFISH during the year.
- 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. Staff members developed and executed Python scripts to check recently migrated Columbia basin fish distribution events for gaps, overlaps, measure anomalies, and inconsistencies with the routes they were mapped on. We corrected events for selected records where issues of contiguity needed to be addressed.

With each data submission, we worked with Regional StreamNet staff to ensure exchange compliance. Corrections and deletion of duplicate RefIDs (reference document identifiers) also occurred during and subsequent to data submissions. Oregon StreamNet's Quality Assurance/Control draft document was also updated to reflect lessons learned during this effort.

Metadata was created for recently migrated distribution data in the Columbia basin and carcass placement data. The process for migrating barrier data to the Framework Hydrography was also documented. Staff members worked on adding attribute descriptions to metadata records contained in the ODFW Data Clearinghouse.

- Region** PSMFC performed quality control procedures on the data submitted by the other StreamNet partners for inclusion in the StreamNet database. Suspected errors and inconsistencies were reported back to the data submitters. Most of these procedures are routinely run whenever a data set is received. One non-routine quality assessment was a thorough review of all age data that have been submitted to date. A major part of this review was to ensure that all StreamNet partners were interpreting the age data they capture in the same way, but other checks were also performed. Overall the age data looked quite good. While there were several types of errors scattered in a few records, only one systematic error that affected a large number of records was found. This error was easily fixed and the data were resubmitted. The other errors were reported to the data contributing partners. The data categories with the greatest increases in data records this project year were fish age data (3,338 records, an increase of 43%), hatchery disposition of fish (2,926 records, +31%). These are relatively new data types and this represents initial submissions from some partners. Other data loaded include hatchery returns (582 records), 464 new trend series, and almost 400 new records each in fish distribution and literature reference tables.

Staging tables were added to the StreamNet database that replicated all tables having location information in order to upgrade location coding and begin and end measure values based on StreamNet's new mixed scale hydrography, which incorporates streams having higher resolution (hence, different calculated linear distances between points due to increased sinuosity) where fish data exists. The staging tables will replace existing tables with location data in December, when the mixed scale hydrography is adopted by all StreamNet participants.

Many StreamNet time series "trends" were modified by compilers this project year to improve the quality of data by combining and/or splitting series based on the physical description of the observations or to represent the information in a better data category. Several thousand trends that were originally compiled by PSMFC staff years ago from NMFS contractor data were also replaced by new trends compiled by StreamNet staff in partner fish and wildlife agencies.

Coding was added to StreamNet trends to identify series that are used by CBFWA in preparing their annual Status of the Resource (SOTR) report. A detailed report showing all Columbia Basin trends and identifying those selected referenced in the SOTR report and a web service in XML was published to enable automated acquisition of annual updates by CBFWA.

The exchanges of the StreamNet library data with the regional StreamNet data system which cites specific documents for all data provided in the web based query system were improved by standardizing the exchange protocol and reducing the number of significant differences between the two data systems.

Three "quarterly" meetings of StreamNet technical staff were conducted at which data compilers, geographic information system specialists, and programmers coordinated with regional staff at PSMFC to resolve data exchange issues and strategize about ways to incorporate improved methodologies and technologies to expedite data flow and enhance accuracy.

WDFW The Washington StreamNet Location Data Manager submitted location data for a natural spawner data submission, corrections for the September 2007 hatchery returns data submission and polygon layers to assist the Regional GIS Manager in creating a more useful region wide county layer. The Location Data Manager submitted a correction update for the dam dataset as well as for barrier and dam data with relevant mixed scale hydrography codes and measures. The Data Manager has completed ~80% of a task to better manage WA StreamNet data by making all data available to all staff.

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 for this Title During Fiscal Year 2008

CRITFC The StreamNet Librarian began researching standards for electronic documents and began developing an exchange standard for electronic versions of reference documents. The CRITFC member tribes agreed to reexamine and improve their data sharing procedures as part of implementing the recently negotiated Columbia Basin Accords. This work will begin in FY09. And, as described above, XML schema were developed and tested for reporting Library catalog records and age data to the StreamNet regional office.

FWS No substantial work or discussion of the DEF occurred during the year that affected FWS.

IDFG IDFG participated in all Steering Committee and Technical Subcommittee meetings in which data exchange issues were discussed. IDFG worked with other StreamNet partners to develop a data source field in the StreamNet Generalized Fish Distribution data exchange format.

MFWP StreamNet staff attended technical staff meetings during FY-08 via conference call where DEFs were discussed. No other DEF work was conducted by Montana StreamNet.

ODFW We participated in discussions regarding DEF updates and potential changes to the Age data tables, as well as the development of SuperTrends and a Sightings DEF. Oregon StreamNet's Data Analyst spent considerable time reviewing and applying data to proposed SuperTrend development options, and pulled together "EMAP" data to use as an example for SuperTrends. Our GIS Coordinator participated as a member of the Sightings DEF workgroup, evaluating whether 'Basis' field categories used in the 2002 Westslope Cutthroat Trout Assessment will work for each of the agencies. The new field was proposed to the StreamNet steering committee for inclusion in the Fish Dist table.

Staff also drew attention to the need for a juvenile abundance DEF.

Region The StreamNet Data Exchange Format (DEF) has been stable for several years. Several minor changes are in process and will be implemented in a new DEF version during FY-09. One significant addition to the DEF pursued this year was the addition of "SuperTrends." A "trend" is the term used to indicate a time series; a SuperTrend is a way in which related trends can be associated. For example, the relationship between redd counts, live fish counts, and carcass counts collected during the same spawning ground survey can be depicted by using SuperTrends. As another example, sometimes the way index counts are done changes over the years, such as redd counts that previously covered an entire stream but that later are restricted to only areas where redds had been seen. Both these counts are meant to represent the entire stream, and the use of SuperCodes can show unambiguously that the sampling regime changed. The decision to pursue and display SuperTrends was made this year and will be completed in FY-09. An attempt to better capture and display data collected under an EPA GRTS study design was pursued but has been deferred for now due to its complexity and additional information needs. PSMFC staff is pursuing this topic with NOAA Fisheries and Oregon State University.

Every StreamNet partner that contributes field data has indicated they would like to be able to contribute individual observations to the StreamNet database without having to create and maintain the overhead associated with "trends." Also, in past years PSMFC has worked with groups that would like to be able to contribute observations of other types of animals, notably macroinvertebrates. During this fiscal year PSMFC staff developed a draft DEF for capturing these individual observations. This draft DEF was developed by comparing roughly 20 to 25 previous efforts at capturing observations data. The draft was designed to be able to contribute data to and obtain data from the Global Biodiversity Information Facility (www.gbif.org), permitting us to increase the amount of data available via StreamNet. In addition, this observation DEF is capable of tracking related observations, and thus is an alternative paradigm under which trend (time series) data can be captured and maintained. As a test of this concept the trend data currently in StreamNet were converted to a database structure based on this new paradigm. While there were several minor difficulties, the conversion went smoothly. This potential paradigm shift in how StreamNet captures and delivers data will be further explored in FY-09, and will be further tested by a separate PSMFC coastal cutthroat trout project being conducted under other funding (see Work Element 189, Title V, and Milestone 3, "Coordinate with related activities outside of the FWP").

WDFW Washington StreamNet staff researched and conferred with other technical team members about a new FishDist.Basis field proposal to show users which records are based on surveys, judgments, or other criteria. We also reviewed existing and future data categories to direct new super codes within the StreamNet Data Exchange Format (DEF).

Work Element: 161 Disseminate Raw & Summary Data

Work Element: 161 Disseminate Raw & Summary Data

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 for this Title During Fiscal Year 2008

CRITFC The library continued to evaluate and update the website for the library portion of the project. The CRITFC intends to establish a web server and map interface to share data and reports developed under the Columbia Basin Accords. We anticipate sharing legacy databases on this server as well.

IDFG IDFG used the StreamNet web site on a regular basis to query data and help others in IDFG in how to use the web site to query for data they were looking for. We also provided input to the redesign of the StreamNet web site.

MFWP MFWP StreamNet staff reviewed the StreamNet website and provided comments to Janet Hess-Herbert to take to the fall Steering Committee meeting. A new user interface for internal FWP staff to query and report the Montana StreamNet data (MFISH) was completed in FY-08.

ODFW Functionality-related feedback was provided to Regional StreamNet staff throughout the year based on ongoing review of the StreamNet website. We also participated in discussions related to improving the StreamNet website and the online query system.

All Oregon StreamNet websites were maintained and updated as needed throughout the year. Links to the revamped StreamNet Library site were updated to maintain direct access for NRIMP site users. We continued to manage the Corvallis Research Lab's website, where project results and reports of several major ODFW data collection projects are posted. Several ODFW Progress and Information Reports, and citations for the site's index page were drafted and posted to the site during the year. This gives Oregon StreamNet immediate and direct access to datasets of interest to StreamNet. A manual for updating NRIMP-managed sites was also developed.

Sensitive species map services were made available this year. Data access white papers were updated to include information for accessing these map services as well as various GIS programs (ArcGIS, ArcExplorer Java and ArcGIS Explorer).

Staff vacancies during the year hindered our ability to track and maintain web usage statistics.

Region Significant progress was made toward a major redesign of the StreamNet web site, improving the ease of finding and delivering tabular data, maps, and other related information to end users, as well as improving the overall user experience with the StreamNet website. As preparation for the redesign effort, we solicited feedback on website and query function during the Western Division American Fisheries Society meeting held in Portland in May. The redesign should be completed and the new website online in the first quarter FY-09. In addition to the web site look, functional improvements were pursued. We identified the files in the FTP archive that should be made searchable, and they will now be searchable from the new web site.

In order to serve data to CBFWA's Status of the Resource web site and to support querying data by populations as defined by NMFS and CBFWA, we began to identify data types and individual trends that are appropriate to assign to a population. This work will continue into FY-09 and will include completing the assigning trends to a population, entering this information into the database, and modifying the query system to permit querying data by population. A web service based on XML was established to automate flow of data to CBFWA for inclusion in the SOTR.

Increasingly, in addition to online access to maps and GIS layers, StreamNet receives requests for digital map products in the form of web map services. The Regional StreamNet GIS Specialist has responded to requests for assistance using web mapping applications and services and has targeted future development to better meet these needs. This includes cooperation with national and regional Portals designed to make spatial data and services easily findable.

Several issues with the query system were discovered during the year. These included incomplete information for the age data, and trend locations not being displayed on the counts pages. These will be resolved in FY-09.

Use of the StreamNet website for data acquisition and general information was similar to FY-07 and remained strong, as described in the Summary of Accomplishments section (Tables 4 and 5). We did a better job of screening Internet robots and web crawlers from the website this year and believe that these counts are accurate indications of actual site use. While overall site use is high, we feel that the primary targets for the project are professional biologists accessing tabular and GIS data. There were over 12,000 individual tabular data query sessions, not counting StreamNet staff, where nearly 19,000 actual data results were viewed. This represents approximately 50 individuals per work day throughout the year using the tabular data query, and does not count the use of the interactive map applications or direct downloads of the database or individual tables. 10,619 individual users participated in 27,080 map sessions.

The most sought data types from the tabular data query system, in decreasing order, were Photographs, Adult return - redd counts, Adult return – estimates of spawning population, Fish distribution, Prebuilt maps, Adult return – peak spawning counts, Hatchery returns, Barriers, Dam/weir counts, Protected areas, Facilities – hatcheries, Harvest – freshwater/estuary, Facilities – dams, Adult returns – spawner/recruit estimates, Habitat restoration/improvement projects, and Smolt density model data. The most sought information from the interactive map interfaces was fish distribution.

WDFW StreamNet staff within WDFW regularly participated in reviewing the StreamNet website, commenting on and suggesting improvements to design elements with intent to improve both data accessibility and user experience.

Work Element: 161 Disseminate Raw & Summary Data

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 for this Title During Fiscal Year 2008

CRITFC The StreamNet Library responded to over 1,000 requests for various documents (Tables 1, 2 and 3).

FWS No StreamNet specific data requests were received or worked on during the year.

- IDFG StreamNet provided responses to over 180 data requests that came directly to IDFG (Tables 1, 2 and 3). Requests for fish species distribution far outnumbered any other data category.
- MFWP StreamNet staff responded to 79 fisheries related requests for maps, data or web content (Tables 1, 2 and 3). This included MFWP IS Request Tracker Requests (internal), mediated data requests and additional requests tracked through the StreamNet User Request database. Request information from the StreamNet User Request database was sent to PSMFC.
- ODFW Oregon responded to 220 requests; 135 from ODFW requesters and 85 from external requesters (Tables 1, 2 and 3).
- Region During the year, PSMFC responded to 40 direct requests for information or assistance in getting data (Tables 1, 2 and 3).
- WDFW StreamNet staff answered approximately 20 major data requests (Tables 1, 2, and 3). Among these, two regional staff members were involved in fulfilling a region-wide Chinook data request using the StreamNet query system, augmenting the downloaded files as needed. In addition, data compilers answered several other data requests of diverse nature and involving coho data from Cedar Creek, Chinook harvest data for the University of Idaho, survey location information, East Fork Lewis presence/ absence data, smolt trap data and spawning ground survey data, among others.

Work Element: 161 Disseminate Raw & Summary Data

Title: 3 Library: Provide access to the library collection

Description The StreamNet Library will provide user 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 collection, and staff to answer location questions and respond to requests. They will provide library services to the StreamNet user community, the Council's Fish and Wildlife Program, and the general public. They will network with other agency and regional library service providers 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 opened to patrons on all business days, and patrons have full access to the collection in person and through phone or Internet requests and to services such as Interlibrary Loan, document searches, etc.

Project Accomplishments for this Title During Fiscal Year 2008

CRITFC The library maintained regular hours. Customers accessed the collections through various means of communication, including telephone, email, Internet and in-person contacts.

Work Element: 189 Regional Coordination

Work Element: 189 Regional Coordination

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

Description Participate in planning, development and/or coordination meetings with regional projects and programs under the Fish and Wildlife Program to help develop a regional data management framework, to establish data type and data service priorities, and to provide advice in the area of data management, as requested. Provide input on ways StreamNet can effectively contribute to the programs and general advice about data management. Participate in coordination groups (e.g., CBFWA), 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 relative to its data development activities. This also includes planning for the next round of subbasin planning and related activities.

Deliverable StreamNet staff have participated actively in and supported 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. Regional agreement is reached on priorities for StreamNet data development for the remainder of the three year funding cycle.

Project Accomplishments for this Title During Fiscal Year 2008

CRITFC The StreamNet Librarian met with staff from the Columbia Basin Fish & Wildlife Authority (CBFWA) to negotiate the receipt of documents referenced in the Status of the Resource report prepared by CBFWA. Library staff also participated in other programs outside the library such as the sea lion hazing work and on steelhead reconditioning. CRITFC member tribes recommended that the NPCC incorporate recent agreements made under the Pacific Salmon Treaty, Columbia River Fishery Management Plan and the Columbia Basin Accords into its revised Fish and Wildlife Plan.

IDFG The IDFG StreamNet project coordinator participated as IDFG's representative in the NED Executive Summit. He also participated in the Columbia Basin Fish and Wildlife Authority's Data Management Framework Subcommittee. StreamNet worked closely with the IDFG Columbia River Policy Coordinator to develop and submit proposed amendments to the Fish and Wildlife Program. We also participated in initial meetings with PNAMP and ISEMP in their efforts to develop better regional data sharing protocols.

MFWP Montana provided data assistance to BPA funded Montana projects through the use of inFISH. No other requests were made.

ODFW Considerable focus was given to supporting CBFWA's Status of the Resource (SOTR) report, updating all SOTR data summaries contained in the StreamNet data system. This included Hood River and Deschutes dam and harvest data, 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. In response to a request, we gathered information and professional insight regarding the appropriateness of using the term "jacks" when describing steelhead returns.

The Oregon StreamNet Project Leader participated in a number of regularly scheduled NED/PNAMP meetings, contributing to shared discussions about data management-related activities and future directions or funding options. A great deal of effort went into working with CBFWA to develop proposed FWP amendment recommendations.

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

Region The Columbia Basin Fish and Wildlife Authority (CBFWA) publishes data about the status of fish and wildlife in the Columbia Basin via their Status of the Resource web site (www.cbfgwa.org/sotr). StreamNet worked with CBFWA this year to improve how CBFWA obtains data from StreamNet for the SOTR reports. We identified the StreamNet data CBFWA uses, and created a first draft web service (based on an existing StreamNet XML schema for hatchery returns data) for providing these data to CBFWA in real time as requested by their servers. This effort will continue into the first two quarters of FY-09.

The StreamNet Program Manager continued serving on the steering committees for NED and PNAMP, and participated with the CBFWA Data Management Framework Subcommittee. Several PSMFC personnel participated on various workgroups, including the NED Metadata group, and the PNAMP Data Management and Effectiveness Monitoring work groups.

WDFW This year StreamNet agency representatives participated in several regional data meetings including the WA Governor's Forum on Monitoring, and PNAMP Executive Summit, among others. Additionally, we participated in coordination with Northwest Indian Fisheries Commission (NWIFC) and Washington natural resource agencies regarding the development of common hydrography layers, and several meetings between NOAA, WDFW, The Upper Columbia River Salmon Recovery Board and Washington Department of Ecology regarding statewide smolt data development.

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 for this Title During Fiscal Year 2008

CRITFC Data source agencies have negotiated with the library to not submit full documents when the material being referenced is already listed in the library catalog.

IDFG As part of the Idaho Fish and Wildlife Information System, StreamNet coordinated with IDFG and partner agencies to develop a statewide information system of fisheries data. In particular, we worked with the Nez Perce Tribe and the US Fish and Wildlife Service in the development of a regional Hatchery Data Management System and Spawning Ground Survey. IDFG has been assigned the lead role in the current Westslope Cutthroat Trout Status Assessment Update. Although funded by non-StreamNet funds, StreamNet is playing a key role in providing technical assistance and data management support in the effort. Such status assessments have proven to be important sources of information for StreamNet.

MFWP Tribal data when available is submitted to MFWP via Scientific Collector Permit and/or through the annual data collection efforts conducted by Montana StreamNet staff. During the course of the year StreamNet Staff attended an interstate Yellowstone Cutthroat Trout workgroup meeting in December 2007 where the database, and update of the database, was discussed. StreamNet staff participated in the Yellowstone Geographic Management Unit (GMU) update meeting in February 2008. Staff also participated in the Bighorn GMU update meeting in May 2008. Discussions and coordination with Idaho regarding the Westslope Cutthroat assessment occurred in the third quarter. Staff was also involved in the Interstate Yellowstone CT update and the westslope CT assessment with Idaho. The Crucial Areas and Connectivity Assessment project was started in FY08. Pilot areas have been developed based on comments from a scoping team comprised of FWP biologists and regional fish and wildlife managers. Currently available data, including data from MFISH, for the selected pilot areas has been mapped, summarized and provided to biologists for review. Next steps will be to acquire additional data and input data into the appropriate database. After additional data is incorporated into databases, potential metrics based on available data will be developed and applied to the pilot areas.

ODFW Oregon StreamNet staff members drafted data development proposals and coordinated with staff members from the Dept. of Administrative services, Bureau of Land Management and the Oregon Dept. of Transportation to obtain funding to migrate non-Columbia basin anadromous fish distribution data to the Framework hydrography and to convert Oregon barrier information to the Oregon Fish Passage Barrier Data Standard. Once completed, this work will allow Oregon to submit a complete statewide distribution dataset in the most recent hydrography to StreamNet, as well as a more complete and consistent barrier database.

Staff initiated exploratory discussions with potential funders regarding developing a comprehensive native migratory fish dataset. We also coordinated with ODFW monitoring and evaluation staff and developed a plan to reconcile coastal coho and steelhead distribution data with data submitted to StreamNet. We also discussed the need for establishing a process whereby current coastal distribution data can more readily be integrated into the statewide fish habitat distribution datasets, which could also satisfy the same need statewide.

Oregon StreamNet staff met with Fish Division ESA Program staff to discuss the Takings database and what improvements could be made to render more of the records useful for StreamNet and for conversion to a GIS format. There is a wealth of observation and possibly trend information in this database, but some issues with the location component need to be resolved. Fish Division staff mainly use a NOAA Fisheries database so they do not have complete control over the design of the database.

The Oregon StreamNet Project Leader attended the first meeting of the Oregon Plan Monitoring Team Data Subcommittee. Attendees contributed their agency's data priorities, including Conservation Strategy priorities to create a more comprehensive list that needs to be prioritized.

Oregon StreamNet's GIS Coordinator spearheaded the development of a statewide Fish Habitat Distribution Data Standard for Oregon. Representatives from affected agencies (ODF, OWEB, ODOT, DSL, INR, NOAA, PSMFC, BLM, and USFS) participated in a standards development workgroup to complete this effort. The Standard was remarkably completed in three months and received endorsement from Oregon GIS Program Leaders and the Geospatial Enterprise Office.

Increased effort to obtain tribal and non-ODFW data resulted in a number of successes, including receiving Three-mile Dam count data from the Umatilla Tribe. This data has not been updated since 2004. We also received data for spawning surveys conducted by the Paulina Ranger District in the John Day subbasin. We also contacted Oregon tribes to assess their data holdings and interest in sharing information through StreamNet.

We spent time perusing archives in a Willamette River ODFW office to locate historic data useful to StreamNet. This type of work needs to continue to be done as many offices are running out of space and will eventually start throwing out potentially one-of-a-kind valuable data.

We routinely promoted the concept of holding an ODFW Data Summit with agency staff, and met a couple of times to detail plans and desired outcomes for the meeting. However, due to the off-year legislative session and other staff demands, ODFW decided to postpone plans for a Summit until an undetermined future date.

Staff members continued to chair and participate in the ODFW GIS Coordination Group, including several Group and Subgroup meetings. Much of the effort this year focused on putting into action short-term GIS Implementation Plan actions in the face of no additional funding, and producing two GIS Newsletters for agency staff. We completed data access "white papers" and a GIS software comparison document which compares ArcView, ArcExplorer Java and ArcGIS Explorer. ODFW management approved funding for the development of an agency GIS training program, which we started late in the year.

Region As described in the StreamNet Vision document (http://ftp.streamnet.org/pub/streamnet/projman_files/StreamNet_Vision-Strategic_Plan2006.pdf), we have increased emphasis on supporting our partner agencies in building increased data management capabilities that, while serving agency needs, will also improve data flow to StreamNet, allowing greater automation of conversion to the regional DEF and uploading to the StreamNet database. PSMFC has supported the initiative of IDFG StreamNet to cooperate in the development of the Idaho Fish and Wildlife Information System, and this year participated in a successful test of an automated data conversion to StreamNet DEF from IFWIS. We anticipate this system will significantly improve the efficiency of transfer of data from IDFG to StreamNet in our DEF format. We have worked with WDFW to support their efforts toward developing an agency wide approach to data management, and worked with them to develop preliminary versions of data entry templates for field capture of smolt trap and spawning ground survey data. We arranged a meeting with ODFW where IDFG demonstrated their IFWIS system, and are also participating in a cooperative project between ODFW and EcoTrust/State of the Salmon to develop a pilot online data sharing application.

WDFW WDFW StreamNet Personnel met with Northwest Indian Fisheries Commission to standardize our respective hydrography layers as well as share resident fish distribution data in the Puget Sound area. We also collaborated with NOAA and Upper Columbia River Salmon Recovery Board staff and contractors to begin development of a statewide Washington smolt database.

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 for this Title During Fiscal Year 2008

CRITFC The library continued to provide services for various groups outside the FWP but which have direct relevance to fish and wildlife in the Pacific Northwest. We worked with the Vancouver Lake Watershed Partnership to provide documents for contractors and researchers with federal agencies who are working on a restoration plan for Vancouver Lake. We also worked briefly with the Salmon Creek Watershed Council and will continue the relationship into FY-09.

The CRITFC StreamNet Project Leader participated in regional efforts to improve data collection and sharing practices through membership on the Steering Committees and workgroups of the Northwest Environmental Data Network (NED) and the Pacific Northwest Aquatic Monitoring Partnership (PNAMP).

CRITFC and its member tribes began efforts to coordinate and standardize monitoring and data sharing practices under the Columbia Basin Accords. These activities will also be coordinated with those of our regional partner agencies.

IDFG Idaho StreamNet coordinated with the Lower Snake River Compensation Program in the development of a basin-wide hatchery data management system. FWP StreamNet staff contacted Glacier National Park (GNP) personnel to discuss improved data sharing. StreamNet staff met with GNP in April, 2008. A database with similar structure to MFISH was given to GNP to hold their fish survey information. StreamNet staff will be in contact with park staff to exchange data or provide support to the database. StreamNet staff met with the new statewide restoration data coordinator to review FWP fish and wildlife restoration data. MFWP Restoration Project data will be included in any statewide restoration data sharing tool.

ODFW Oregon StreamNet staff continued coordination with staff from EcoTrust and ODFW Monitoring Program staff on an approved funding proposal for EcoTrust to help ODFW discuss and document the data and data management needs of the Monitoring Program. This year, EcoTrust obtained funding to develop a data management and dissemination tool for the ODFW Monitoring Program. Oregon StreamNet staff will provide data and database consultation, and PSMFC may be called upon to house the system on their server.

Our GIS Coordinator corresponded with a number of groups and efforts throughout the year, including attending Framework Implementation Team and Oregon GIS Project Leaders meetings, obtaining input on the development of Oregon distribution and barrier data standards, reviewing efforts to develop enterprise GIS solutions for the state, and learning about GIS applications in other agencies. In addition, he attended a NOAA Fisheries led Integrated Status and Effectiveness Monitoring Program (ISEMP) meeting in Portland and provided an overview of the NRIMP/Oregon StreamNet program. He responded to a DAS / GEO survey regarding the use of ESRI GIS licenses within the agency. This involved researching the number of active licenses, the number of anticipated GIS licenses and also annual maintenance costs. The survey is intended to inform the process for the state entering into an enterprise GIS license agreement with ESRI. He also attended regular Framework Hydrography meetings to stay up on the process of migrating the Framework data to the NHD format and Hydro Event Management Tools.

Staff members continued to coordinate Oregon's effort to develop a statewide barrier inventory database and restoration prioritization system. Efforts to obtain additional funding for the inventory and prioritization proposal continued throughout the year.

One staff member participated via conference call in the Coastal Cutthroat Trout Technical Team's database development meeting. We distributed an email to sources of coastal cutthroat observation information in Oregon to inform them of this effort, and provided coastal cutthroat observation data to Tara Smith, PSMFC, for her cutthroat data compilation project.

We reviewed Measurable Criteria documentation for the Oregon Coast Coho ESU Recovery Plan and created a summary showing the criteria, data types required, and their relationships to each other and StreamNet data holdings. We also responded to a request from OWEB related to a performance measure of salmon habitat quantity.

Region StreamNet personnel from IDFG and MFWP provided data for and participated in the 2001 and 2006 range-wide assessment of Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) and the 2002 westslope cutthroat trout (*O. clarki lewisi*) range-wide assessment, as well as the 2004 bull trout (*Salvelinus confluentus*) status review and assessment. During this fiscal year PSMFC was approached by a group from NBII and Wyoming Game and Fish conducting a range-wide status assessment for Colorado River cutthroat trout (*O. clarki pleuriticus*). We offered advice and directed them to the people who did the Yellowstone and westslope assessments, but did not become involved with this effort which is outside of the StreamNet geographic range. A second group also approached PSMFC, this one wishing to begin an effort for a range-wide assessment of coastal cutthroat trout (*O. clarki clarki*). This subspecies falls within the geographic and subject matter spheres of PSMFC and StreamNet. StreamNet assisted PSMFC in beginning a project to capture documented observations ("sightings") of coastal cutthroat trout. This assistance is expected to benefit StreamNet in return as it will allow us to test a database structure for observations data which we created but have not yet tried to implement, and will also allow us to gather coastal cutthroat trout data without using StreamNet funds. Cooperation between these projects will continue into FY-09 and perhaps beyond. The Western Native Trout Initiative (WNTI) is funding some of the work and NBII has expressed interest in coordinating the assessments for all the western trout, and perhaps eventually creating a single web resource where such data can be found. We intend to remain in contact with them in order to coordinate efforts -- many of the species of interest lie within the StreamNet/CalFish geographic range, so we want to ensure that duplicative work is avoided.

Also during this fiscal year PSMFC was approached by USFWS to assist with an evaluation of smolt trapping operations in California's Central Valley. PSMFC also chose to pursue this project. We expect this project to assist StreamNet by 1) letting us better capture and present smolt abundance data; 2) promoting coordination and data standardization between smolt trapping projects throughout the range of anadromous salmonids, and 3) providing us with contacts to people who do smolt trapping, thus hopefully promoting data sharing via StreamNet. Most of this effort is being conducted under contract with FWS.

PSMFC staff attended the Amphibian Conservation Workshop hosted by ODFW and the Oregon Zoo. This group is very early in their attempts to share data and other information. The draft observations data structure that PSMFC has developed (see Work Element 160, Title N Application and interface development) would probably work very well for their needs. We asked to be notified of future workshops, and will request to be added to the speakers list to present data sharing ideas.

Staff participated in an Oregon lamprey workshop where we provided suggestions for developing a coordinated approach to data management as they develop programs to determine lamprey range and status. We also attended a lamprey session at the AFS Western Division meeting, and will continue participating in other lamprey workshops. The goal is to assist lamprey biologists in data capture and management and to facilitate transfer of lamprey data to StreamNet for wider regional use. Project staff also attended a workshop on green sturgeon, providing suggestions for coordinating data management across the involved agencies. And, the Program Manager participated in a workshop sponsored by the Washington Governor's Forum on Monitoring.

WDFW WDFW StreamNet Personnel in collaboration with Northwest Indian Fisheries Commission staff came together to standardize our respective hydrography layers as well as share resident fish distribution data in the Puget Sound area. We also collaborated with NOAA and Upper Columbia River Salmon Recovery Board staff and contractors to begin development of a statewide Washington smolt database.

Work Element: 99 Outreach and Education

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Title: 1 **Professional and public involvement**

Description As needed, produce public information materials and as possible participate in various meetings and forums (public or professional) to explain the project's capabilities and purpose and to generate support and additional data sources. Activities may include brochures, issue papers, demonstrations, guidance documents, posters and talks to public, policy or professional groups and organizations.

Deliverable Materials describing the project are made available, and professional groups are informed about the project and its services.

Project Accomplishments for this Title During Fiscal Year 2008

CRITFC Library staff continued to maintain roles in several professional organizations, including International Association of Aquatic & Marine Science Libraries & Information Centers (IAMSLIC), Natural Resources Information Council (NRIC), Pacific Northwest Library Association (PNLA), and the American Fisheries Society (AFS). Library staff either presented at the annual meetings of these groups or participated in poster sessions to promote the library's visibility.

Other presentations were made at professional meetings such as the Northwest Interlibrary Loan Conference. The library also contributed brochures for distribution to attendees for natural resources professional conferences held in the Pacific Northwest.

During FY-08, library staff members were present at several area events/festivals. The Sturgeon Festival at the Water Resources Education Center in Vancouver, Washington is an annual event with around 1,000 visitors. The Oxbow Salmon Festival is held at the Oxbow Regional Park. Library staff members were present at this festival as well and were seen by 8,000 plus visitors.

The CRITFC StreamNet Project Leader led a tribal delegation to the National Science Foundation / European Union sponsored conference on "Human, Physical, and Natural Capital Investment in Patagonia: A Predictive Approach Under the Sustainability Criterion." This conference was held in Concepcion, Chile in August. Tribal presentations explained the problems and lessons learned in the Columbia Basin regarding sustainable management of natural resources.

IDFG StreamNet did not participate in any professional or public involvement activities.

MFWP The updated MFISH web application was presented and feedback was obtained at the Fisheries Division meeting held in December, 2007. Additional outreach for inFISH and MFISH was provided by Montana StreamNet staff during the annual visits to biologists.

ODFW Oregon StreamNet staff gave several presentations this year, including an "Overview of GIS at ODFW" at the GIS Program Leaders meeting, and distribution and/or barrier standard presentations to the Oregon Fish Passage Task Force, the OGIC Standards Forum, and the Natural Resources Information Council conference.

Region Two StreamNet Newsletters were sent out this year as planned. Newsletter #8 was sent out April 14, 2008, to 937 people; Newsletter #9 was sent September 30, 2008 to 954 people. In #9 we invited people who run smolt traps to contact us to participate in a project PSMFC is doing under separate funding but which will help StreamNet better collect and deliver smolt trap data (see Work Element.189, Title V Coordinate with related activities outside of the FWP). We were subsequently contacted by 3 groups running smolt traps within the Columbia Basin and will involve them in the project.

A joint meeting of the Oregon Chapter and the Western Division of the American Fisheries Society was held in Portland in 2008. We utilized this opportunity to gain feedback from biologists on the StreamNet

website, data, query system, mappers, and library. A questionnaire was employed asking people to use the query system and tell us their experiences and ability to find what they were looking for. The input we received has been helpful in guiding future query system development and data presentation.

The Project Leader presented a talk on approaches for capturing and managing data at the Western Oregon Lamprey Workshop. He also participated with Oregon Trout on Salmon Watch field trips for middle and high school classes to view spawning salmon and learn about salmon ecology and management, on personal time.

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 for this Title During Fiscal Year 2008

All Project partners all performed routine project management and administration at their respective levels. These included project guidance through the quarterly Steering Committee meetings, budgeting, expenditure tracking, personnel management and reporting. Unique situations are discussed below for individual partners.

CRITFC Regular project administration was accomplished. There were some unanticipated delays in converting legacy age databases and in developing XML applications to report these data. This delayed reporting age data from the second quarter to the fourth quarter. A significant change in project organization took place this year with signature of the Columbia Basin Accords. Beginning in FY-09, the CRITFC portion of StreamNet, including the StreamNet Library, will be funded through a direct contract with BPA. This administrative change will not change the relationship between the CRITFC portion of the project and the rest of StreamNet.

MFWP There were several changes in StreamNet staff this year, including: Adam Petersen was added as a half fish half wildlife information specialist. MFWP ran over budget due to the hiring of a short term worker to help with historic data entry.

ODFW We filled one of two vacant application developer positions, but the new developer resigned after 6 months to accept another position outside the agency. We also lost our Data Technician in the 4th quarter of the year; he accepted another position within ODFW. We lacked the resources to fill the second vacant developer position. And, staff cross-trained in the field to gain knowledge of field techniques, participated in online technological training, and mandatory agency training.

Region Routine project administration continued. The FY-09 Statement of Work was adjusted prior to submission to remove the CRITFC subcontract, which will be included in a direct contract between CRITFC and BPA under the Accords. No change to the relationship between StreamNet and CRITFC is anticipated. Five years of level funding has eroded the amount of staff time that can be covered by the StreamNet contract at PSMFC, resulting in several staff members placing more of their time on other PSMFC projects and on a new contract with FWS to evaluate the data systems used in the Central Valley, CA, to estimate smolt populations from rotary screw traps. We anticipate that all of these efforts will ultimately support StreamNet objectives.

WDFW Washington Region 5 StreamNet staff members were successful in administering the level funded budget and operating in a manner to successfully complete all work elements within those guidelines. We hired a replacement Lead GIS data Manager with the intent of modernizing our geographic information data systems. The project was managed within budget, but only by limiting data acquisition and development to the Lower Columbia subbasins.

Work Element: 132 Produce Annual Report

Work Element: 132 Produce Annual Report

Title: 1 **Annual report**

Description Produce a detailed Annual Report for FY-07 project activities within 60 days of the end of the fiscal year.

Deliverable The annual report is submitted on time.

Project Accomplishments for this Title During Fiscal Year 2008

All All project partners contributed to the FY-2007 Annual Report, which was submitted to BPA on schedule during the first quarter of the year.

Work Element: 185 Produce Pisces Status Report

Work Element: 185 Produce Pisces Status Report

Title: 1 **Quarterly reports**

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

Deliverable Quarterly Status Reports are submitted on schedule.

Project Accomplishments for this Title During Fiscal Year 2008

All All project partners contributed to the quarterly Status Reports, which were submitted to Pisces on schedule during the year.

Work Accomplished Outside the SOW

Description During the course of the year, opportunities arose to accomplish work that was meaningful to the StreamNet Project but that was not specifically detailed in the annual Statement of Work. In some cases, this relates to work on the StreamNet contract, often to acquire useful data on an opportunistic basis. In other cases this is work that was performed by StreamNet staff members but on other funding, since the StreamNet contract does not cover all staff members for the full year. In these cases, only work that was directly relevant to StreamNet is reported here.

Project Accomplishments for this Title During Fiscal Year 2008

CRITFC Library staff maintains membership in groups outside of management agencies with some ties to the general idea of resource management or history of the area. During meetings for these groups, we promote the library and the unique resources housed in the collections. Specifically, the Library Technician sits on the Advisory Board for the Native American Student and Community Center at Portland State University. This position gives him access to a broad range of potential customers. The Assistant Librarian has advertised the StreamNet Project through various media venues including radio and television programs. The Assistant Librarian also serves on the State Advisory Committee for Historic Preservation (Oregon). Updating legacy databases and developing improved data input and reporting applications were largely done with CRITFC resources separate from the StreamNet budget.

IDFG Idaho Fish and Game was appointed as the lead data agency for the upcoming westslope cutthroat trout range-wide status assessment update. Using non-StreamNet funds, we worked to migrate the most recent status data, developed on 1:100,000 scale hydrography, to the 1:24,000 scale National Hydrography Dataset. The existing native trout status assessment database and data entry application was updated to provide a more functional data entry application and a more robust database design. StreamNet staff served in an advisory role and made sure that the data will be compatible with StreamNet data standards. StreamNet staff will participate in the status assessment workshops during the coming year.

Using non-StreamNet funds, IDFG has started to develop whole-stream routes and migrate LLIDs to the 1:24,000 scale National Hydrography Dataset. Working on the Westslope Cutthroat Trout (WCT) Status Assessment Update, IDFG developed an ArcGIS application to route the NHD based on the current 1:100,000 scale PNW hydrography. Initially, the project will focus on attaching existing WCT assessment data to the 24K NHD and not all of the state of Idaho will be used. However, after completion of the WCT status update, these applications will be utilized to route the entire Idaho 24K hydrography with anticipation of sometime in the future migrating the IDFG databases to 1:24,000 scale LLIDs and updating the multi-state PNW hydrography.

MFWP The StreamNet Project Manager and staff continued to provide data management support and solutions for monitoring and providing products from the Comprehensive Fish and Wildlife Conservation Strategy. StreamNet staff members designed and MFWP resources were used to rewrite the MFISH web-based query and reporting. Significant GIS Requests filled during the year included support to conservation activities associated with Montana's Westslope Conservation Agreement and enabling Montana's State Hatcheries on the FWP website. Montana, as the steward of the multistate Yellowstone Cutthroat Trout Assessment, has spent considerable time creating a database for data edits, entering updated data and creating a map project that is linked to the database. Staff also participated in the Bighorn GMU update meeting in May, 2008. Discussions and coordination with Idaho regarding the westslope Cutthroat assessment occurred in the third quarter. Staff was also involved in the Interstate Yellowstone CT update and the westslope CT assessment with Idaho. The Crucial Areas and Connectivity Assessment project was started in FY-08. Pilot areas have been developed based on comments from a scoping team comprised of FWP biologists and regional fish and wildlife managers. Currently available data, including data from MFISH, for the selected pilot areas has been mapped, summarized and provided to biologists for review. Next steps will be to acquire additional data and input data into the appropriate database. After additional data is incorporated into databases, potential metrics based on available data will be developed and applied to the pilot areas. Genetic maps were provided to all MFWP fisheries staff for use in the field.

ODFW Non-Columbia fish distribution data were updated and maintained. With funding provided by ODFW, nearly 1,700 new publications were entered into the bibliography this quarter. We now have over 32,000 items in the ODFW Library bibliography.

We 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, 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 converted the Fish Screening and Passage Database from MS Access to an online SQL database, with the system going live during the 4th quarter. This work was performed by a contracted programmer. Staff nearly completed an online application to modernize fish transportation and propagation permitting in the state. This will be completed next year.

Data compilation of Oregon Watershed Council datasets was completed during the 3rd quarter. At the end, 402 watershed council datasets with metadata were available on the NRIMP Data Clearinghouse website, from 80 different councils.

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; providing products for Wildlife Movement Strategy workshops; 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 PSMFC StreamNet staff participated with several projects not specifically identified in the Statement of Work on funding provided by other agencies outside the contract with BPA. This is made possible and necessary by the fact that the contract does not cover the full year for each employee. We helped PSMFC initiate a project related to a status assessment for coastal cutthroat trout. Our role was to oversee and assist the initial work of the PSMFC employee hired for this work, and to guide development of a database to capture information on observed or documented occurrence ("sightings") of coastal cutthroat trout, primarily the anadromous form. We also spent a small amount of time on initiation of a project to evaluate the databases used for rotary screw trap data in the Central Valley, California. Most of that work will be done under a contract between PSMFC and USFWS in FY-09. We also coordinated with several other cutthroat trout assessment groups, including the Colorado River, westslope and Yellowstone subspecies.
- WDFW Washington StreamNet data compilers participated in a series of meetings with NOAA to discuss future database needs and sharing possibilities. Additionally, we conducted research on how to store new sonar data that is currently being collected by agency biologists, attended a green sturgeon workshop, attended aquatic invasive species training, and participated in the Western pond turtle trapping project.