

StreamNet

Northwest Aquatic Information Network

Annual Report 2004 - 2005

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StreamNet Project

BPA Project Number 198810804

2005 Annual Report

October 1, 2004 through September 30, 2005



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April 17, 2006

StreamNet Project

BPA Project Number 198810804
(www.streamnet.org)

Fiscal Year 2005 Annual Report

This report summarizes StreamNet Project activities during fiscal year 2005 (FY-05). Detailed descriptions of accomplishments by individual objective and task are provided in the Project's quarterly progress reports, available on the reports and publications page of the StreamNet web site at www.streamnet.org/about-sn/project_management.html.

What is StreamNet?

StreamNet is a cooperative data compilation, development, and distribution project involving the state, tribal and federal fish and wildlife agencies in the Columbia River basin. The project focuses primarily on fish related data generated by the fish management agencies in the Columbia Basin. It is funded by the Bonneville Power Administration (BPA) through the Fish and Wildlife Program (FWP) of the Northwest Power and Conservation Council (NPCC), and is administered by the Pacific States Marine Fisheries Commission (PSMFC). The project is organized to perform three broad functions:

Agency support: The project supports staff in the Idaho, Montana, Oregon and Washington state fish and wildlife agencies; the Columbia River Inter Tribal Fish Commission (CRITFC); and the U.S. Fish and Wildlife Service (USFWS) who locate, obtain quality check and format specific types of fish related data. They convert these data into a standard Data Exchange Format (DEF) and submit them, with references, to the regional StreamNet office. They also provide information technology related support to their respective agencies to assist data flow.

Regional Support: The regional component of StreamNet at PSMFC administers the project, coordinates with the FWP and other regional entities, and disseminates data regionally. As data are received from cooperators they are again quality checked then imported into the StreamNet database. Access to the data is provided on-line via a tabular query system and interactive map applications at www.streamnet.org. The web site also provides access to independent data sets from other projects, pre-sorted data sets useful for specific purposes (such as the recent pesticide spraying ruling or subbasin assessments), and general fish information for education purposes.

Reference Support: The StreamNet Library, located at CRITFC, maintains access to all reference documents supporting the data in the StreamNet database, and provides full library services for patrons interested in fish and wildlife in the Pacific Northwest. The StreamNet Library also maintains probably the largest collection of agency gray literature related to fish and wildlife resources in the basin. The library participates in the Inter Library Loan program, and can exchange literature worldwide.

What Data Are in StreamNet?

Currently available data types include:

- Fish distribution
- 1:100,000 scale (100K) routed hydrography (GIS streams layer)
- Adult abundance in the wild (redd counts, peak spawner counts, dam counts, etc.)
- Hatchery releases (currently being revised)
- Hatchery returns
- Dams and fish passage facilities
- Hatchery facilities
- Harvest
- NPCC Protected Areas
- Smolt density model data
- Independent data sets (searchable data archive)
- Genetics (primarily for trout in Montana)

The project is also working on other data that could be provided regionally if support is obtained, including: habitat restoration / improvement projects, barriers and screened diversions, juvenile abundance and outmigration, age, production factors and run reconstruction, and habitat.

The StreamNet Cooperators

PSMFC administers the StreamNet project, manages the regional database and maintains the regional data delivery system. Six subcontracting agencies perform the project's data development and library functions, provide data services within their agencies and disseminate additional data.

The StreamNet project within CRITFC administers the StreamNet Library and data support programs. It is active in supporting improved data management throughout the basin and for preserving subbasin planning data. It also provides assistance for development of data systems within CRITFC's member tribes.

Four state StreamNet projects (ID, MT, OR and WA) are organized within the Idaho Department of Fish and Game, Montana Fish, Wildlife and Parks, Oregon Department of Fish and Wildlife and Washington Department of Fish and Wildlife. These projects serve as primary conduits of data from the field agencies to the regional StreamNet database and also provide data and data related services within their agencies.

The U.S. Fish and Wildlife Service StreamNet project (FWS) focuses on data from the National Fish Hatchery system. It is part of the hatchery data management program within the USFWS.

The cooperating agencies provided additional support to the StreamNet Project in FY-05 through a number of in-kind and direct contributions, including staff salary support, data provided by agency field staff, computers and computer services, travel and office space. The specific contributions varied by agency.

Who Uses StreamNet?

In past years, the top users of the StreamNet website based on IP domains have been universities (OSU and UW most often); NOAA Fisheries and a variety of other federal agencies including the BLM, Forest Service, USACE, BOR, EPA, USFWS, BPA, etc.; the state fish and wildlife agencies; tribal organizations; various consultants (frequently from .com domains), and anonymous users from Internet Service Provider (ISP) domains (representing professionals working from home or remote offices and the general public). This year, the identifiable agency IP addresses represented only approximately 12% of total use of the website (Fig. 1). The .com addresses were the most abundant, and they likely include various private consultants. Unknown ISP addresses (ip?) certainly continue to include a number of professional users working from home or remote offices plus the general public. The .org addresses, nearly equal to the professional agencies, probably include a number of different organizations such as non-profit (environmental and industrial), professional and watershed council type groups. Because of the uncertainty of the actual components of these various groups, and the increasing lack of transparency of Internet users, we did not attempt to break use out by individual agencies this year. It is possible that the widespread use of search engines may be leading more casual users to the site, changing the proportion of domains recorded.

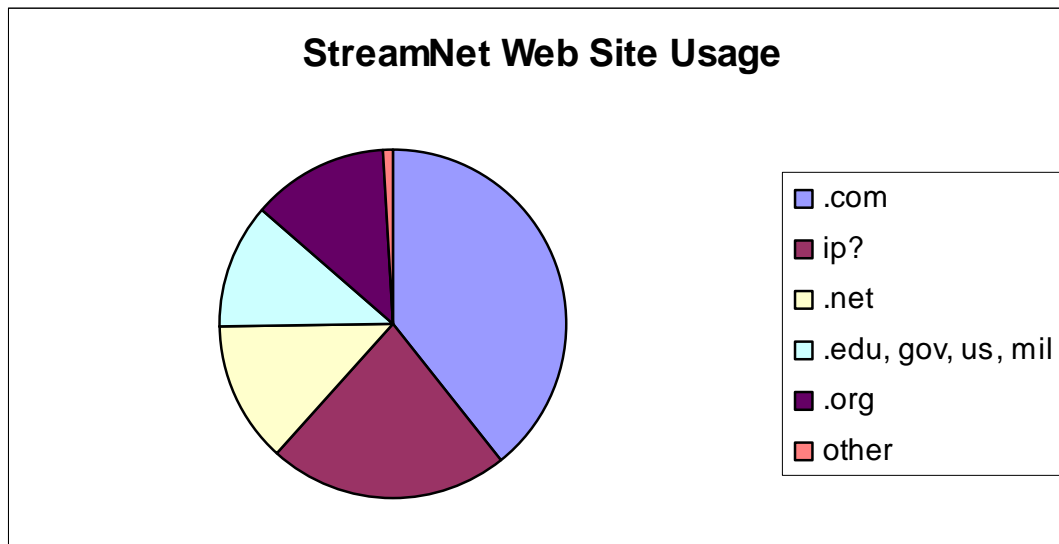


Figure 1. Categories of user IP Addresses accessing the StreamNet website in FY-05, excluding regional StreamNet users and identified web robots.

A total of 735,262 page views were recorded during the year, a decline from last year (Fig. 2). Actual use of the tabular data query system to obtain data remained consistent with recent years, however, and increased from last year (Fig. 3). This represents the number of times users clicked on the “View Available Data” link on the data query system, giving the most reliable count of actual data access. Depending on the detail included in the query, each “view data” click could represent obtaining data for a single trend up to large numbers of trends which could then be further broken down or downloaded.

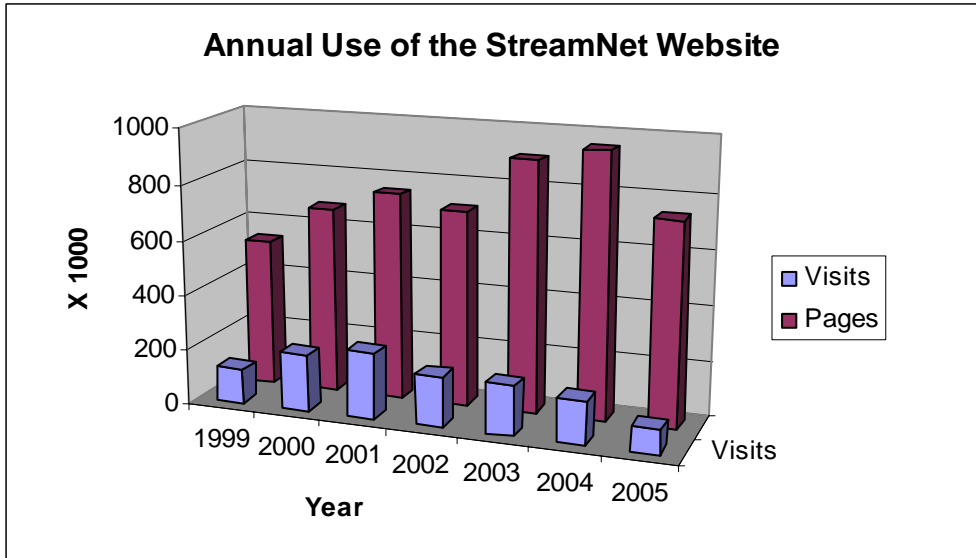


Figure 2. Annual use of the StreamNet website.

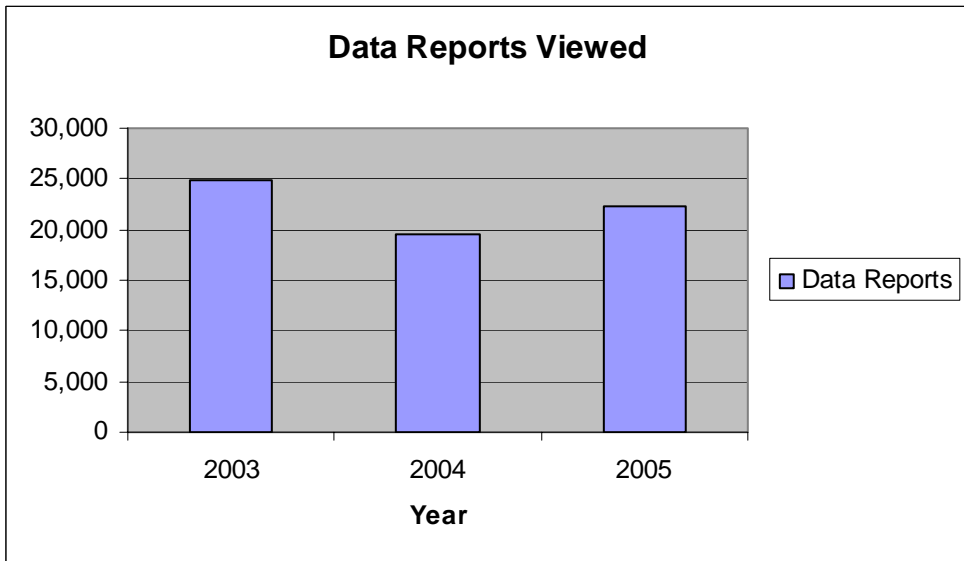


Figure 3. Number of actual data returns viewed by users of the StreamNet tabular data query system, FY-05.

These statistics represent use of the main website and the tabular data query system, not the interactive map interfaces, which are being tracked separately. Because we have been building new map applications to access various types of data, and we have been changing and improving the system to track use of those applications, we do not have a long term track record for use of those sites. After modifying the use tracking system to eliminate robots and other meaningless uses, the interactive map websites averaged 27,165 page views from 464 unique users per month for the last four months of the fiscal year. We believe that use of the online map applications is growing, and we will begin reporting use in future years.

Work Element 159, Data Development

In FY-05 StreamNet's cooperating projects obtained, quality checked and updated data for all routine data categories. These included fish distribution, adult abundance (including redd counts, dam counts, spawner counts), hatchery returns, facilities, harvest, 100K hydrography, etc. More specific information on data updates is contained in the quarterly performance reports, available at www.streamnet.org/about-sn/project_management.html.

The number of data updates varied by cooperator. PSMFC loaded a total of 14,165 records into a subset of key data categories during Fiscal Year 2005 (Table 1).

Table 1. Summary of significant data records added or updated in the StreamNet database.

Data Category	Records	Data Category	Records
Location codes	14,362	Reference documents	4,038
Barriers	13,412	Peak spawning counts	3,266
Trend series	12,021	Est. of spawning population	2,375
Fish distribution	8,784	Dam/weir counts	318
Hatchery returns	6,310	Barrier fish impacts	294
Redd counts	4,860	Habitat restoration projects	159
Age	4,847	Dams	144

Specific Data Development Highlights for FY-05:

- **Fish Distribution:** All state projects maintained and updated fish distribution data as needed. ID updated steelhead, sockeye, Chinook, white sturgeon and bull trout data. The bull trout data were posted as an Independent Data Set. MT updated fish distribution records, completing most of the 2004 data backlog. ~2,000 fish distribution / habitat use records were exchanged for species of special concern. A survey of field data collection by MFWP biologists was conducted as a step in developing data collection standards. OR maintained data and added draft redband trout data. WA transferred existing rainbow trout and coastal & westslope cutthroat trout data to the 24K scale, with exchange anticipated after finishing the mixed scale hydrography. A significant update to bull trout distribution was made based on the USFWS 5-year status review. New federal west-slope cutthroat trout data were obtained, but in unusable format. These data will be converted and exchanged in FY-06.
- **Adult Abundance in the Wild:** All partners worked on abundance data during the year, including conduct of QA reviews. CRITFC updated and exchanged all mainstem dam counts and existing spawning ground survey data. ID compiled 2004 redd count data and conducted a major QA evaluation that led to re-developing the data by individual transect locations, with exchange planned next fiscal year. Dam count data were deferred due to the QA review process. MT obtained and exchanged 9,000 adult abundance records from resident fish surveys. OR performed QA on all abundance data and added new data and exchanged all new and updated data by the end of the year. WA updated Lower Col. R. adult trap database with 2003 and 2004 data with work planned for earlier years' data. Adult abundance data were updated through 5/1/05 with 35,000 records converted to DEF.
- **Hatchery Returns:** FWS Exchanged 2004 hatchery return data in the new DEF. ID compiled 2004 return data with exchange planned after the quality review of trends. OR submitted

hatchery return records for 2003 and partially through 2004. WA converted and exchanged 6,100 records, representing all historic data through the 2003-04 return year, and developed automated routines and restructured data tables to assist the next exchange, planned in Q3 of FY-06.

- **Hatchery Releases:** Work on unrolled hatchery release data was delayed this year due to the extensive QA review of other data sets and work by all partners on developing a DEF for this data type. FWS maintained release data in sr80s file of CRiS database and forwarded 2005 release information to RMIS. IDFG began development of a common hatchery data management system with IDFG Fisheries staff. MFWP provided data for the last 10 yr. to PSMFC as an Independent Data Set and for use in developing the DEF for unrolled release data. OR contributed test data in the prior year, progressed toward linking spatial location codes to hatchery release sites in Oregon, and contributed to DEF work. WA contributed sample data and worked with WDFW on a major overhaul of hatchery data systems.
- **Dams and Fish Passage Facilities:** These relatively static data were maintained, with updates added as needed.
- **Hatchery Facilities:** These relatively static data were maintained, with updates added as needed.
- **Harvest:** CRITFC identified and sent links to sites containing harvest data to the Regional office. ID obtained harvest data, but exchange was delayed by QA of other trend data. OR exchanged all new and corrected data early in the 4th quarter.
- **Hydrography:** ID made over 300 modifications to the hydrography. MT continued coordination with USGS on progress on the MT 24K NHD hydrography. OR accomplished a lot of work on developing the mixed scale hydrography. The data were maintained, updated and exchanged in early August. WA completed a mixed scale hydrography, using 100K plus 24K streams with attached data. With WDNR, they assimilated lakes data into a single geodatabase and will complete more after the mixed-scale hydro is complete.
- **Habitat Restoration and Improvement Projects:** CRITFC Created databases of tribal PCSRF and BPA projects and will update and convert the data into the DEF and exchange. MT added ~90 new projects, made significant improvements to the database interface, and remained ready to participate with local habitat projects on an opportunistic basis. They re-developed the database structure, developed a data entry interface, and exchanged data in the fourth quarter. OR and WA maintained existing data, but this was not a priority data set this year.
- **Barriers:** ID compiled bull trout barriers from the recent 5-year status update and posted the data as an Independent Data Set. MT updated these data in the 4th quarter. OR improved data coding, developed a new map format and posted maps on the ftp site. They developed improved usability of this data set. WDFW converted over 12,200 culvert records to the DEF and exchanged them. This was the first conversion from the WDFW database.
- **Juvenile Abundance:** Low level work continued on developing a DEF for these data. Project partners worked on a few isolated data sets, but significant capture of these data awaits completion of the DEF.
- **Screens:** Council members expressed a need for development of diversion and screening information, but this has been a low priority due to staff resources, and little progress was made this year. MT updated screen data in the fourth quarter, with exchange anticipated in the future. OR evaluation of these data and georeferencing of screen locations were delayed due to

staff vacancies this year. Efforts were shifted to making data compilation more efficient in the future through redesign of the database.

- **Age:** CRITFC updated and submitted existing trends to the regional staff for posting. FWS exchanged 2004 age data in the new DEF. ID compiled 2004 age composition data, but exchange will occur after the QA review of trend data. OR compiled and fit Age Data into the Age Table in the newest DEF. WA exchanged age data for the 2003 return year (4,520 records) in the second quarter. 4,847 age records were converted to the new DEF and exchanged for all fish in the natural abundance data set.
- **Other Data Sets:** CRITFC updated and archived subbasin planning data from the Oregon subbasin assessments, and began work on obtaining subbasin planning data from other states, all on other funds. MT entered genetics data throughout the year and maintained the genetics database. OR compiled native non-game fish distribution information into a single database.
- **Independent Data Sets (IDS):** PSMFC created and maintained a computer tool to facilitate submission of data sets in native format to StreamNet for posting in the IDS searchable archive. PSMFC also posted 20 Independent Data Sets, including resident distributions, temperature data, and stock status data, and worked with other entities to promote posting of data, including the NW Mussel Working Group. Links to various online data sources were also added to the IDS database, with searchable indexes. IDFG posted the 5-year bull trout status review dataset as an Independent Data Set.

Work Element 160, Data Management

Data management work included routine maintenance and upgrade of multiple databases and data sets, GIS and computer systems, websites, and online applications and services at the cooperator and PSMFC levels. A key effort this year was a thorough QA review of data at all levels of the project. Much of the data management work took place behind the scenes; specific details are available in the quarterly progress reports.

Specific Data Management Highlights for FY-05:

- **Systems Administration:** All cooperators performed system maintenance and upgraded hardware and software, as needed. ID received new server capacity from IDFG and configured and migrated to Windows Server 2003. OR obtained needed replacement hardware.
- **Application Development:** All cooperators maintained the various tools and applications used to manipulate, manage and load data. ID nearly completed migration to a .NET environment. MT developed a new interface for habitat restoration projects data. OR developed a data inventory database & tools for CBFWA's Collaborative Systemwide Monitoring and Evaluation Project, and continued work on the ODFW corporate information system. PSMFC started work on completing the NHD / LLID conversion tool, but the NHD and LLIDs are no longer in synch, so this effort was deferred. Plans to build an online tool to assign LLID stream locations was deferred due to cost of software and low demand for the service. WA overhauled its internal spatial data format for fish distribution to make a simpler layout based on the natural hierarchy.
- **Data (content) Management:** A key objective for data management in FY-05 was to conduct a thorough QA review of all data sets and make corrections as needed. All cooperators participated in this effort. CRITFC reviewed each trend and edited and corrected them before

submitting them for posting in the StreamNet database. FWS added new data throughout the year and reviewed and revised older data as needed. ID nearly completed QA reviews of existing trend data, including redd counts, hatchery returns, and age. The review led to complete revision of redd count data to provide data by individual transect rather than rolled up by stream. MT reorganized the GIS data in the Natural Resources Information System (NRIS) database. OR performed a comprehensive QA review of data which will continue into the first quarter of FY-06. WDFW linked GPS maps to location fields for 1½ HUC4s in the Escape Data database. QA reviews were conducted on hatchery returns, age, adult abundance, 24K hydrology, trend data, and locations data. PSMFC provided assistance to cooperators to reconcile submitted data with the DEF to ensure loading. All tabular and GIS data were maintained and updated, with QA checks, as data were exchanged by cooperators.

- **Data Exchange Format (DEF):** All cooperators participated in ongoing reviews and updates to the various DEFs. All participated in finalization of the Age DEF. Work to revise or add new DEFs for Fish Sightings, Hatchery Returns, Hatchery Releases, and Barriers continued. PSMFC published one revised and updated version of the DEF during the year.

Work Element 161, Data Dissemination

The preponderance of data dissemination from the StreamNet database takes place online through a tabular data query system and several interactive map applications. Because of the anonymous nature of the Internet, the actual volume of data obtained can not be tracked. In addition, many of the StreamNet projects in the data source agencies also maintain websites for data dissemination, and all cooperators respond to direct requests for data. The project also provides data for a variety of other projects related to the Northwest Power and Conservation Council's Fish and Wildlife Program (FWP).

Specific Data Dissemination Highlights for FY-05:

- **Internet Sites:** All cooperators contributed to ongoing review and updating of the primary StreamNet website (www.streamnet.org). Several partners also maintained their own Internet sites. The StreamNet Library website at CRITFC crashed in the first quarter, but downtime was minimized and all information was recovered. Increased backup safeguards were instituted. PSMFC reviewed and updated the "Related Links" page, and also added links to other data sources to the searchable data archive known as the Independent Data Sets page. A new interactive map application was added, and a tool was built to track use of the interactive map applications portion of the website.
- **Information Requests:** While the majority of data from StreamNet are distributed through the online query and map applications, the project also responds to direct requests for information. All cooperators responded to numerous such requests during the year (Table 2). Details on the number of requests received and handled are provided in the quarterly progress reports.

Table 2. Summary of the number of information requests addressed by the StreamNet cooperators in FY-05. This does not include data, maps or other information obtained through the online applications.

Cooperator	Requests
CRITFC (StreamNet Library)	>900
IDFG	160
MFWP	68
ODFW	157
PSMFC	97
WDFW	119

- **Support the FWP with Data and Maps:** The number of direct requests for data and maps from FWP related projects declined with the completion of the Subbasin Planning effort. CRITFC Provided data analyses and maps for the John Day plan. MT provided aerial photos and updated GIS layers for the Flathead & Kootenai R watersheds for land acquisition projects. PSMFC provided maps and or data to several subbasin groups and CBFWA staff.
- **Protected Areas Data:** PSMFC continued to maintain and provide access to the Protected Areas data in the query system and through the interactive map application.

Work Element 98, Library Services

The StreamNet Library provided storage and retrieval services for data source documentation for all data entered into and contained in the StreamNet database, plus full library services with an emphasis on fish and wildlife literature. Other StreamNet partners also provide some library services within their agencies, but at a lower level of effort.

Specific Library Services Highlights for FY-05:

- **Collection Development:** All cooperators submitted data source documentation to the StreamNet Library at CRITFC for data exchanged to the StreamNet database. CRITFC maintained the existing collection, updated journal subscriptions, obtained new literature from various sources including agencies and nonprofit organizations, and received data source documentation from the other project cooperators. All new literature was indexed and added to the catalog. ODFW continued organization of the ODFW Library, with many additions to the catalog.
- **Provide Access to the Collection:** CRITFC provided access to the StreamNet Library collection by maintaining regular business hours at the library and through Internet access via the StreamNet Library website at <http://www.fishlib.org/>.
- **Provide Library Services:** CRITFC provided a wide array of library services, including servicing requests for data source literature from the StreamNet website, providing literature to in person and online patrons, and through Interlibrary Loans. Use of the StreamNet Library continued to increase.

Work Element 118: Coordination

StreamNet cooperators coordinated with a variety of agencies, projects and programs in the region in order to coordinate the flow of data from field collection to regional use, provide data management expertise, and assist with data system development.

Specific Coordination Highlights for FY-05:

- **Support to the Fish & Wildlife Program:** Many StreamNet members worked with various programs and projects supported through the FWP. The StreamNet Program Manager at PSMFC provided support to the Northwest Environmental Data-network (NED) and the Pacific Northwest Aquatic Monitoring Partnership (PNAMP) and served on the steering committee for each. CRITFC's StreamNet Project Leader served as an ex-officio member of ISAB and on the steering committees for NED and PNAMP (largely on other funding). CRITFC also coordinated member tribal input & interaction with states on the BiOp remand and NOAA recovery planning. The state StreamNet projects and PSMFC worked to support the Collaborative Systemwide Monitoring and Evaluation Project administered by CBFWA. The ID, WA and OR projects conducted data inventories for CSMEP in selected data rich and data poor subbasins and the OR project developed a database and Internet interface to capture and house information from the inventories. The state projects also participated with several workgroups under NED and CSMEP.
- **Support Subbasin Planning:** CRITFC Developed analyses, databases and maps for the John Day plan, and working with the TOAST group updated the Oregon subbasin planning data archive. MT Reviewed management portions of 2 subbasin plans and participated in calls re. subbasin planning data. OR supported Oregon efforts to capture subbasin planning data via the Toast group, and made data available on the StreamNet website. WA provided WA Columbia Basin EDT data to CRITFC for inclusion in a repository of all basin EDT data. PSMFC Participated with CRITFC, the Council and NED in developing a plan to capture all data used in the recent subbasin planning effort.
- **Coordination Outside the FWP:** StreamNet members coordinated with a wide variety of other agencies and programs outside of the FWP during the year. CRITFC continued ongoing liaison with tribes regarding data management, and assisted with database development plans. ID assisted development of a Standard Stream Survey for IDFG using StreamNet data standards. MT met with other agencies and USGS re. 24K NHD development and maintenance. OR assisted OWEB, the North Coast Portal, Oregon Plan monitoring, the Hydro Framework, barrier standards, and others. They also coordinated with the ODFW Hatchery Information Management System on data flow and with the fish screen program. WA worked with the PNW Hydro Framework on 24K hydrography issues, TNC on EDT, the Hatchery Reform Team, and WDFW wildlife data managers. PSMFC worked with NOAA Fisheries, the NW Interagency Mussel Workgroup, marine essential fish habitat, and others.

Work Element 99: Professional and Public Involvement

StreamNet members participated in various meetings and other avenues and produced materials to promote the project's services and to encourage greater sharing of data. The StreamNet Librarian at CRITFC consulted on reference management with the Johnson Creek Watershed

Council and OWEB, gave a professional presentation to the Natural Resources Information Council, and wrote a whitepaper on marketing for NED. ID trained IDFG staff in the use of computer technology to analyze and interpret fisheries data. MT gave presentations to MFWP regional meetings and new employee orientation about StreamNet. OR presented historic fish run information related to the Columbia Basin in the area of Celilo Falls for the Oregon Outdoor School Program within the Corvallis School District, wrote a StreamNet Newsletter article on Marine Resources work, and spoke informally with staff at the ODFW Fish Biologist's meeting about StreamNet and how StreamNet contributes/can contribute to ODFW efforts. WA assisted at the WDFW information booth at the Clark County Fair (lower Columbia Basin). PSMFC gave presentations on StreamNet to the American Fisheries Society and the Organization of Fish and Wildlife Information Managers (on other funding), and published two issues of the StreamNet Newsletter highlighting project accomplishments. PSMFC also published the 2004 Annual Report as a brochure, and presented it to the NPCC at one of its meetings.

Work Element 119: Manage Project Activities

All project cooperators conducted routine project management activities, including guiding the project through participation in the StreamNet Steering Committee, personnel management, budget development and expenditure tracking, and collaborating on developing the new project proposal and statement of work.

Work Element 141: Quarterly Reports

All project cooperators participated in writing quarterly progress reports, which are available online on the Reports and Publications page of the StreamNet website at http://www.streamnet.org/about-sn/project_management.html.

Work Element 132: Annual Report

All project cooperators participated in writing an annual report for FY-04 which was submitted to BPA in the first quarter and was subsequently transformed into a brochure for wider dissemination. The annual report is available on the Reports and Publications web page.

Program Management

Routine program management continued throughout the year for all cooperators, including regular quarterly meetings of the StreamNet Steering Committee, budget management, personnel management and reporting.

Summary

Fiscal Year 2005 was successful for the StreamNet Project. A major Quality Assessment was made of the data in the StreamNet database at all levels of the project. Significant progress was made in updating the existing data in the StreamNet database, involvement with and support of other regional programs increased, and technological improvements were implemented. Data system reliability was excellent and on-line data query system data reports increased.