

# StreamNet Project

BPA Project Number 198810804

## 2003 Annual Report



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([www.streamnet.org](http://www.streamnet.org))

## Fiscal Year 2003

## Annual Report

October 1, 2002 through September 30, 2003

This report summarizes StreamNet Project activities during fiscal year 2003 (FY-03). Descriptions of accomplishments by individual objective and task are detailed 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](http://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. It is funded by the Bonneville Power Administration (BPA) through the Fish and Wildlife Program (FWP) of the Northwest Power and Conservation Council, and is administered by the Pacific States Marine Fisheries Commission (PSMFC).

### **What Does StreamNet Do?**

StreamNet obtains specific fish related data from the basin's fish and wildlife management agencies, standardizes the data into a common format so that similar data are consistent and can be combined and compared across the basin, and makes them available via the Internet or as custom data products. All data are referenced to hardcopy documents or electronic databases, with the references available in the StreamNet Library. The project provides data related services and assistance to the FWP, and publicly posts data from independent projects not part of StreamNet.

### **What Data Are in StreamNet?**

Currently available data types include:

- Fish distribution
- 1:100,000 scale routed hydrography (GIS streams layer)
- Adult abundance in the wild (redd counts, peak spawner counts, dam counts, etc.)
- Hatchery returns
- Dams and fish passage facilities
- Hatchery facilities
- Harvest

- Protected areas
- Smolt density model data
- Independent data sets

Data types that are not yet complete or are undergoing development include:

- Hatchery releases
- Habitat Restoration/ Improvement Projects (prototype)
- Barriers and Screened Diversions
- Juvenile Abundance and Outmigration
- Age
- Production Factors and Run Reconstruction
- Habitat (initial development)
- Genetics (primarily for trout in Montana)

### **The StreamNet Cooperators**

PSMFC administers the StreamNet project and maintains the data delivery system. PSMFC subcontracts with six agencies to perform the data development and library functions of the project, provide data services within their respective agencies and disseminate additional data, as described below.

The Columbia River Intertribal Fish Commission (CRITFC) StreamNet project includes the StreamNet Library and data support programs. It is active in supporting improved data management throughout the basin and especially for subbasin planning in Oregon.

The Idaho Department of Fish and Game StreamNet project (ID) is housed in the Natural Resources Policy Bureau. It works closely with the Fish Bureau and the Natural Heritage Program, and is implementing an agency-wide fish data management system.

The Montana Fish, Wildlife and Parks StreamNet project (MT) is part of the Information Management Services Unit within Department Management. It maintains a close partnership with the Natural Resources Information System and the Natural Heritage Program (<http://nris.state.mt.us>), and manages StreamNet data in the Montana Fisheries Information System (<http://nris.state.mt.us/wis/mris1.html>).

The Oregon Department of Fish and Wildlife StreamNet project (OR) is the largest part of the Fish Division's Natural Resources Information Management Program (<http://nrimp.dfw.state.or.us/nrimp/>). It develops and provides consistent, accessible, high-quality fish, wildlife and habitat information, and promotes a multidisciplinary approach to resource management.

The Washington Department of Fish and Wildlife StreamNet project (WA) is part of the Fish Program's Science Division. It provides essential compiling, programming and management services for both tabular and spatial fish data within the agency.

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

PSMFC administers multiple data programs with regional scope in addition to StreamNet, including the PIT Tag and Coded Wire Tag data projects, the Pikeminnow Reward Program, the Fish Passage Center, and various marine data projects (PACFIN, RECFIN, AKFIN, EFIN etc).

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

### **How Does StreamNet Function?**

StreamNet is organized into three basic functions.

**Agency support:** The project supports staff in the state fish and wildlife agencies of Idaho, Montana, Oregon and Washington; CRITFC; and FWS, who are responsible for locating, obtaining, quality checking and formatting specific types of fish related data. They convert these data into a standard format and submit them, along with references, to the regional StreamNet office at PSMFC.

**Regional Support:** The regional component of StreamNet at PSMFC administers the project, coordinates with the FWP and other regional entities, and disseminates data. As data are received from the cooperating agencies they are again quality checked, then imported into the StreamNet database. The program conducted by PSMFC represents only ¼ of the total StreamNet project.

PSMFC provides on-line access to the data via an on-line data query system at [www.streamnet.org](http://www.streamnet.org). The data are also available through on-line interactive map applications, where users can map StreamNet data holdings with other map layers, and/or link to StreamNet's tabular database. The web site also provides access to independent data sets from other projects, various pre-sorted data sets useful for specific purposes (such as subbasin assessment), and general fish information useful 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 reports and publications (gray literature) related to fish and wildlife resources in the basin. The library participates in the Inter Library Loan program, and can provide literature to or obtain literature from other libraries worldwide.

## Who Uses StreamNet?

The top users of StreamNet’s on-line data query system in FY-03, based on IP Addresses, are shown in Table 1. These do not include users of the interactive map application, pre-selected data sets, or independent data sets. NOAA Fisheries was the top individual user. Monthly visits remained stable but total page views increased (Fig. 1), suggesting that users are obtaining more from the site on each visit this year.

Table 1. Individual users of the StreamNet web site, by IP address, not including project staff or web robots, in descending order of use.

1. Private Internet service providers <sup>1</sup>	9. Bureau of Land Management
2. National Oceanographic and Atmospheric Administration	10. U. S. Army
3. University of Washington	11. Forest Service, Region 6
4. Parametrix Corp.	12. Oregon State University <sup>3</sup>
5. unresolved numeric IP address <sup>2</sup>	13. Oregon Department of Environmental Quality
6. Idaho state	14. unresolved numeric IP address <sup>2</sup>
7. Oregon Department of Fish and Wildlife	15. U. S. Geological Survey
8. U. S. Department of Agriculture	

<sup>1</sup> Internet service providers, combined. Represents working from home, remote offices, NGOs, general public, etc.

<sup>2</sup> Unresolved numeric IP Addresses. In past years, WDFW use has been recorded as numeric, but this is uncertain.

<sup>3</sup> Includes ODFW Research Lab, Corvallis, OR, and some OWEB staff members

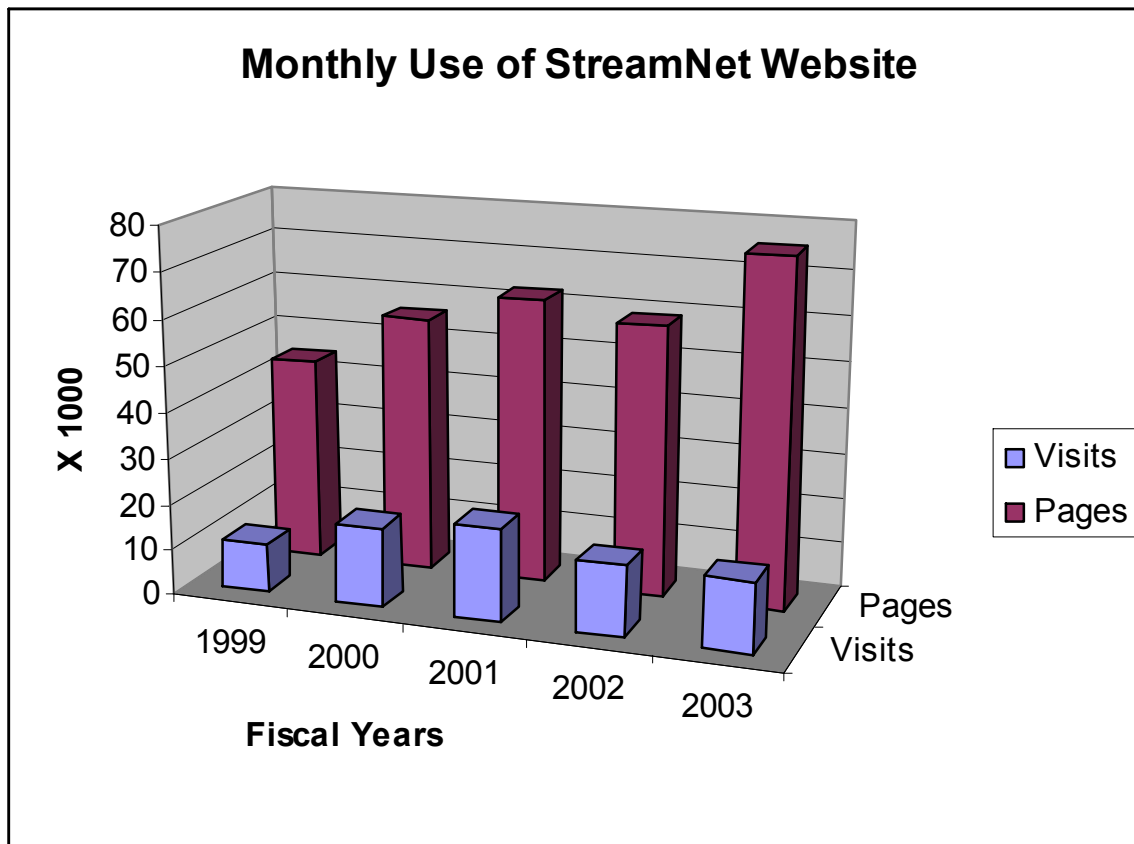


Figure 1. Mean monthly use of the StreamNet website.

## Data Development

StreamNet's cooperating projects obtained, quality checked and updated data for all data categories in FY-03. Examples of general accomplishments included:

- ID completed a quality control review of all Idaho Chinook salmon and steelhead redd count, hatchery return and age composition data.
- MT completed visits to all state and federal field and regional offices collecting 2002 field season data. Data included fish presence and distribution, restoration projects, abundance time series, genetics, barriers, dam and hatchery facilities tables.
- OR updated existing anadromous, resident, and non-game abundance time series through 2001, and opportunistically collected new time series information through 2001-02, as data became available
- WA resolved many remaining time series data issues from contractor derived data that had been input early in project history. Similar efforts have taken place in the other states.
- Data developed by the cooperating projects were submitted to PSMFC, quality checked, revised with the cooperators as needed, and loaded into the StreamNet database.

Work on key specific data types included:

- **Fish Distribution.** ID, MT and OR participated in a cutthroat trout assessment process. OR and WA developed resident and anadromous fish distribution data at the 1:24K and 1:100K scales, and each submitted over 500 records of fish distribution, WA in the revised format.
- **Adult Abundance.** Spawner and redd counts were updated.
- **Hatchery Returns.** OR updated through 2002, including 144 new time series with 1,467 associated records and 1,120 disposition and egg take records. FWS updated through 2002.
- **Hatchery Releases.** Progress was made toward obtaining data on individual releases before they are pooled into PSC release records. OR linked location codes to half their 9,000+ release sites. WA improved spatial accuracy and coding for release locations.
- **Harvest.** WA improved spatial accuracy and coding for freshwater harvest locations and created marine catch area spatial layers and codes.
- **Barriers.** ID established a barriers table and added over 400 records. MT added records from the Westslope Cutthroat Trout Assessment (now being quality checked by agency biologists). OR added over 2,000 barrier and 1,200 dam records and described species-specific fish passage conditions at many barrier structures.
- **Screens.** OR worked with the ODFW Fish Screen Program to begin capturing and organizing data in this pilot effort.
- **Restoration Projects.** The database structure was completed for this prototype, but no support for gathering this data type region wide has been expressed. MT provided data from their Future Fisheries mitigation projects database. Edit maps of project locations were reviewed by MFWP biologists.
- **Age.** All cooperators submitted test data as part of the development process for managing age data for returning hatchery and wild fish.
- **Juvenile Abundance.** ID georeferenced over 2,000 general parr monitoring sites to the PNW 1:100K hydrography maintained by StreamNet.
- **Independent Data Sets.** PSMFC staff developed a database structure to house descriptive information (metadata) about data sets submitted to StreamNet for public access. A number of independent data sets are now available. Work on a new interface is underway. OR obtained

data on salmon carcass placements for stream enrichment purposes for 1998-2000 and 2002 and made them available as an independent data set. MT posted their native fish genetics database.

### **Data Management/Dissemination**

As data development progressed, data were managed within a variety of data systems at the cooperating agencies and PSMFC. Data management activities performed during FY-03 included: management and administration of a variety of hardware systems; web programming; software development and maintenance; maintenance of the regional 1:100K routed hydrography; data quality reviews; database management; data loading; data dissemination; and technical assistance to data users.

Selected data management and dissemination activities performed include:

- ID established an agency-wide fish and wildlife information system based on Windows servers, MS IIS, the .NET framework, and ArcGIS Products (including SDE and ArcIMS).
  - ID, with IDFG, expanded use of applications for spawning ground surveys and juvenile trap data, and incorporated StreamNet data standards into IDFG databases.
  - MT posted GIS layers, with metadata, on-line at <http://fwp.state.mt.us/insidefwp/fwplibrary/gis/>, resulting in substantially fewer direct GIS data requests.
  - OR created an on-line metadata warehouse, allowing users to view, enter, store, edit and produce XML (Extensible Markup Language) metadata documents.
  - OR made significant progress toward a comprehensive information system for time series and barrier data, including bringing a new web server on-line.
  - OR created a master location database, with location codes for streams, lakes, bays, ports, dams, barriers and hatcheries to provide consistent georeferencing across data sets.
  - OR maintained its FGDC metadata for GIS layers and provided its non-spatial metadata format to the StreamNet Steering Committee for review.
  - WA led an initiative to improve the hatchery return and age database structures.
  - WA created a spatial interface to correct errors and gaps in the 1:100K streams layer for accurate references to hatchery release sites.
  - WA captured GPS locations for spawner survey reaches in lower Columbia River tributaries.
  - In addition to on-line data acquisition, the StreamNet cooperators responded to numerous direct requests for data, maps, assistance and information.
- | <u>Cooperator</u> | <u>Requests</u> |
|-------------------|-----------------|
| IDFG              | 166             |
| MFWP              | 80              |
| ODFW              | 158             |
| WDFW              | 154             |
| PSMFC             | 156             |
- PSMFC modified the StreamNet web query system to provide output in XML format, allowing other web sites to incorporate StreamNet data into their web pages in real time.
  - PSMFC initiated a StreamNet Newsletter and produced two issues, which are available at <http://www.streamnet.org/Newsletter/Newsletters.html>. By the end of the year, 943 people had signed up for the newsletter.

- StreamNet removed access to hatchery release data until release locations by stream can be separated from the combined Pacific Salmon Commission area codes, to enable providing and mapping individual release times and locations. As currently coded, releases can't be mapped. Work on this progressed during the year.

### **Library Services**

The StreamNet Library is managed by CRITFC as a regional archive and reference source for natural resource management literature. The library maintained reference documents for all data in the StreamNet database, as well as a wide array of published and gray literature related to fish and wildlife.

Library staff members are active in national, regional, and special focus professional library groups. The StreamNet Library received over 20 requests per month for documents through the Inter-Library Loan system. Staff collaborated with other libraries and groups on developing library holdings and providing access to material via the Internet and other digital methods.

Some specific accomplishments during the year included:

- Building the library collection to 15,620 titles, including serials, with over 60,000 volumes housed.
- Upgrading library management software, allowing more flexibility in posting the catalog to the Internet and allowing use of XML searches through other gateways.
- The largest project of the year was the expansion and remodeling of library space to allow for collection growth. Additional seating for walk-in patrons is also now available.
- Responding to library service requests through the year, including walk-in patrons plus 1,245 requests for documents not held by the library which were met through Inter-Library Loan.

### **Data Services to the FWP**

Project staff at the regional and cooperator levels provided a variety of data related services to agencies and organizations related to the basin's Fish and Wildlife Program, including:

- CBCIS. The Program Manager and CRITFC Project Leader continued participation on the Project Team for the Columbia Basin Cooperative Information System effort to define a comprehensive approach to data management in the basin. The StreamNet cooperators participated through document reviews and by coordinating activities within their agencies.
- PNAMP. The Program Manager participated in the data management portion of the Pacific Northwest Aquatic Monitoring Partnership, which grew from the State/Federal Monitoring Partnership. This has been a technically driven collaborative effort, and provides a regional forum to address monitoring and data issues and standards.
- CSMEP. The Program Manager participated in development of the Columbia Basin Fish and Wildlife Authority's Cooperative Systemwide Monitoring and Evaluation Project. StreamNet will assist by conducting a regional data inventory and catalog during FY-04.

**Subbasin Planning** was a significant effort this year for all cooperators.



- The CRITFC StreamNet project played a key role, particularly in Oregon, where the project leader led the Technical Oversight and Assistance Team (TOAST). Accomplishments included:
  - Helped develop a GIS-based river reach system to support subbasin planning in Oregon.
  - Developed algorithms and applications to convert habitat data into EDT ratings, saving local teams considerable time in conducting subbasin assessments.
  - Developed, with OR, a tool for establishing EDT reach breaks and capturing them in a GIS, allowing information to be mapped and analyzed with other GIS data layers.
  - StreamNet and other sources were used to assemble a standard set of GIS layers and data tables for each Oregon subbasin.
  - A new database system was developed to assist subbasin planners with subbasin assessments.
  - Standard subbasin planning data sets were delivered to subbasin planning groups in Oregon.
- ID hosted the technical staff for the Salmon, Boise / Payette / Weiser, Middle Snake and Upper Snake subbasin assessments, and provided access to a broad range of data and direct technical oversight.
- MT coordinated with MFWP and contract staff to post the Flathead <http://fwp.state.mt.us/flatheadsubbasinplan/> and Kootenai <http://fwp.state.mt.us/kootenai%5FMTsubbasinplan/> plans on the MFWP website.
- OR compiled hatchery fraction data, along with age, hatchery release, aquatic habitat inventory, gradient, and barrier information by subbasin to assist in EDT analysis for Subbasin Planning. They also participated in subbasin planning efforts as a member of TOAST.
- WA provided up-to-date spatial datasets (1:24,000 resolution streams and lakes, fish distribution/use for anadromous salmonids and bull trout), tabular datasets (adult returns, juvenile outmigrants), custom maps, and data interpretation for subbasin planners working on assessments for the Lower Columbia, Columbia Plateau, and Columbia Cascade Provinces.

### **Program Management**

Routine program management, including regular meetings of the StreamNet Steering Committee, continued throughout the year. A few significant accomplishments included:

- Development of a formal protocol for developing and modifying data exchange formats, available at [http://www.streamnet.org/online-data/data\\_develop.html](http://www.streamnet.org/online-data/data_develop.html).
- ID and PSMFC participated in a Habitat Monitoring Workshop sponsored by BPA
- With outside funding, several cooperators participated in the Organization of Fish and Wildlife Information Managers annual meeting, where OR was co-recipient of the Best Poster award.

### **Conclusion**

Fiscal Year 2003 was a successful year for the StreamNet Project. Significant progress was made in updating the existing data categories in the StreamNet database, involvement with and support of other regional programs increased, and technological improvements, such as providing data as XML, were implemented.