



# **StreamNet Project**

**BPA Project No. 1988-108-04**

**Contract No. 20518**

## **Fiscal Year 2006**

## **Annual Report**

**October 1, 2005 through September 30, 2006**

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## **Introduction**

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This report describes work accomplished by the StreamNet Project, Project No. 198810804, during Fiscal Year 2006 (FY-06) from October 1, 2005 through September 30, 2006. A significant change was made in report format this year. With the new requirement to report quarterly accomplishments in a highly abbreviated Status Report form in Bonneville Power Administration's (BPA) Pisces online project tracking system, we eliminated the highly detailed quarterly reports we routinely produced in the past. Instead, we now are presenting a detailed report of accomplishments only in the Annual Report. Thus, this report will present accomplishments in detail at the Work Element Title level, and we have discontinued the brief annual report in brochure format.

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

The work detailed in this report is tied to the specific work elements and milestones contained in the FY-06 Statement of Work, available at [http://www.streamnet.org/about-sn/project\\_management.html](http://www.streamnet.org/about-sn/project_management.html). Work priorities for FY-06 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. An additional focus this year was long range planning for the project and an attempt to develop long term data priorities.

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## Highlights

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Activities in FY-06 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; coordination with related projects and regional entities; and operation of the StreamNet Library, in addition to routine administrative activities to continue project function. A key product this year was publication of A Strategic Plan and Vision for StreamNet in March of 2006, which can be obtained at [http://www.streamnet.org/about-sn/project\\_management.html](http://www.streamnet.org/about-sn/project_management.html). An overview of project highlights is presented below, by major Work Element, with more specific details later in the report.

### Work Element 159: Submit /Acquire Data

StreamNet's participating agencies continued acquisition, updating, georeferencing and standardization of standard data sets during the year.

Work on the hydrography: Routine maintenance of the 1:100,000 (100K) PNW hydrography continued as needed, but emphasis is changing to work at the 1:24,000 (24K) scale. IDFG and MFWP StreamNet are working with the 24K NHD hydrography in their states, while WDFW and ODFW StreamNet are working with the OR/WA Framework Hydrography Clearinghouse process on developing a 24K hydrography. In addition, WDFW completed development of a "mixed scale" hydrography composed of 100K routes plus named streams and streams with StreamNet data at the 24K scale that they edge-matched to Oregon and Idaho hydrography and submitted for adoption and use by the Region until a stable regionally standardized routed 24K hydrography becomes available.

### Idaho StreamNet (IDFG):

- increased the utility of redd count data in StreamNet by completing a review of redd count trends and unrolling redd count data reported to StreamNet from stream level to individual transects (thus increasing accuracy and the number of trends from under 100 to 755)
- updated westslope and Yellowstone cutthroat trout distributions
- updated and revamped redd count trend data to include more detail
- located and georeferenced hatchery release sites
- compiled 2005 hatchery return data
- identified additional barriers for Yellowstone cutthroat trout
- compiled 2005 age and sex composition data

- obtained and exchanged existing diversion screening data
- updated the hydrography, and
- exchanged two source document references for the cutthroat distributions.

#### Montana StreamNet (MFWP):

- conducted its normal rotation of visits to field offices to obtain the latest data
- updated fish distribution records from the 2005 field season information
- assisted the Yellowstone cutthroat assessment effort
- updated fish abundance survey records from 2005
- exchanged dam and hatchery facility data
- updated habitat restoration project data
- added 35 barrier records
- exchanged genetics data updates, and
- exchanged 285 references.

#### Oregon StreamNet (ODFW):

- updated and exchanged distribution records for several populations
- updated ESA status information for coastal coho distribution
- obtained resident and anadromous fish distribution records from field projects
- obtained fish presence data from Oregon Department of Forestry
- updated and exchanged 1,900 abundance records
- updated fish passage status of dams and exchanged 59 new dam records
- updated location information for 86 hatchery facilities
- updated harvest trends
- updated and submitted 1,041 fish barrier records and acquired and evaluated Forest Service culvert data
- exchanged 303 age records
- obtained and posted fish carcass placement records
- updated records in the CSMEP database, including entry of 65 Grande Ronde spring Chinook records, and
- submitted 31 references.

#### Washington StreamNet (WDFW):

- transferred its anadromous distribution data to the new mixed scale hydrography and exchanged the data at the end of the year
- initiated transfer of resident distribution to the mixed scale hydrography
- exchanged 2004 and obtained 2005 adult abundance data
- provided unrolled release data

- exchanged 299 updated hatchery return records to complete the 2004-2005 data and began work on the 2005-2006 data
- compiled 649 dam facility records
- made significant progress on sport harvest data
- explored availability of WDFW habitat restoration project records and exchanged 405 records
- compiled barrier records
- compiled 2005 smolt trap data and used them to evaluate the DEF
- exchanged 2004-2005 age records
- reviewed table structures and codes for water diversions
- posted historic Cedar Creek smolt and adult trap and the Joint Stock Assessment Project data sets to the StreamNet Data Store, and
- exchanged references for all data exchanged.

#### U.S. Fish and Wildlife Service StreamNet (FWS):

- loaded all release and return data for the national fish hatcheries for calendar years 2005 and 2006
- updated staff changes at the national fish hatchery facilities, and
- exchanged return and age data.

#### Columbia River Inter-Tribal Fish Commission StreamNet (CRITFC):

- updated and exchanged 120 Columbia and Snake River dam count and redd count trends in the Yakima River
- worked with CBFWA and the Pacific Coast Salmon Restoration Fund to develop a test dataset
- updated 24 smolt trends in the Yakima River
- updated and exchanged age data, and
- added references from all project cooperators into the StreamNet Library and also added materials obtained through duplicate exchange with other libraries.

#### The Regional office at PSMFC (Region):

- obtained fish barrier data from Region 6 of the Forest Service
- added seven new Independent Data Sets to the Data Store, and
- initiated efforts to develop and post metadata so that all StreamNet datasets will be 'findable' through regional and national portals.

#### Work Element 160: Create/Manage/Maintain Database

All project members performed ongoing systems administration (hardware and software maintenance and management), maintained various data management tools and interfaces, maintained data and database systems, and contributed to ongoing review and development of Data Exchange Formats (DEF). A few key highlights by the individual project members include:

#### The Region:

- upgraded all GIS software to ArcGIS9.1 sp1
- acquired replacement database, web and ArcIMS servers

- migrated the web server from Apache to MS IIS
- updated the web query system to conform with the new Data Exchange Format (DEF) 2006.1
- developed preliminary web data entry and data display tools for a separate project to inventory monitoring efforts for the Pacific Northwest Aquatic Monitoring Partnership (PNAMP)
- activated an ArcIMS web service to make StreamNet metadata available to portals
- loaded new data records, including 4,200 references, 7,700 escapement count records, 1,600 barrier records, 5,000 fish distribution records, 1,350 hatchery disposition records, 4,500 restoration projects records, and 1,000 new time series (trends)
- loaded a complete replacement of IDFG Chinook and steelhead redd count data (6,700 records) by specific location
- updated the Data Exchange Format to reflect various changes and improvements and published it as version 2006.1.

#### CRITFC:

- performed routine maintenance of its computers and applications
- made a major effort to convert the library management software at the StreamNet Library to open source software that will provide significant savings that will help offset rapidly increasing journal subscription costs and other inflation impacts.

#### IDFG:

- obtained and configured a new database server and began migrating data to it
- initiated two new database/application development projects with IDFG Fisheries Bureau staff to capture and manage spawning ground survey data statewide and hatchery data for the agency beginning with the adult trapping portion. Completion of these new database applications will significantly improve and speed up data capture, standardization, and delivery to StreamNet. Progress was slowed later in the year due to resignation of the project database manager/programmer.
- completed review and update of all ID redd count data including separation of data to individual count transects and addition of “non-index” redd counts.

#### MFWP:

- changed system administration when Montana Fish, Wildlife and Parks assumed system administration duties for MFWP StreamNet, with GIS administration still shared between the Information Management Bureau and the Natural Resources Information System
- explored use of the geodatabase model to update management of spatial data
- developed an instream measurements table and user interface
- explored the potential to manage amphibian and reptile data collected during fish survey work.

#### ODFW:

- migrated the web server to ODFW’s secure network but maintained responsibility for operation and maintenance
- coordinated details of server access and update protocols with agency IS staff
- developed a user-customizable component to serve web files via HTTP rather than FTP
- piloted loading of 1m digital ortho-quads (aerial imagery) into ArcSDE
- added high quality print functionality to ArcIMS applications

- continued development and management of geodatabases
- acquired Species Management Unit and Population data sets from the Oregon Plan Monitoring Team
- focused on migrating most databases to SQL Server from MySQL with WebFX as the development platform
- added the public land survey system Township/Range/Section layer to the orthoimagery IMS site
- initiated development of an online fish presence application
- modified the Barrier database structure to track multiple references for each record
- performed quality assurance review of ODFW's Stock Status database
- spent significant effort on ensuring data quality of existing trend data
- made a number of work adjustments which were formalized through a project CCR with PSMFC and BPA because further work on application development was severely hampered by resignation of the project programmers and subsequent lengthy vacancies mid year.

#### WDFW:

- applied various security and software patches and GIS upgrades
- initiated replacement of an aging state-leased computer
- purchased a GPS and software to collect location points of sampling sites on the Columbia mainstem
- began developing a new internal GIS interface to support management of the new mixed scale hydrography and related StreamNet data
- designed, implemented and tested a new system for capturing field updates to fish distribution and use data that greatly simplifies the work of obtaining this information from biologists
- employed Python scripting to concatenate the more complete internal 24K hydrography linework stored in 67 pseudo-drainage units to augment the mixed scale hydrography
- created a storage facility that meets DEF standards to house sport harvest data and data entry and viewing forms for pilot work with this data type
- adopted changes needed to comply with the new 2006 DEF
- made significant progress in cross referencing stream catalog codes to LLID
- identified QC issues with adult trap locations
- submitted corrections to the Barriers table location fields
- worked with the regional staff to deal with hatchery DEF issues such as multiple outfalls.

#### FWS:

- updated virus and spyware software on their computer systems
- updated the CRiS Age program to meet new printer limitations and the CRiS PondInv program to handle use of PIT tags
- performed QA/QC on Returns and Age data
- added new checks on coded-wire tag data and related species and age information to the CRiS programs
- continued discussions with Regional staff on the Age DEF and changed data structures to conform to the new DEF
- rewrote software to account for the new Age DEF.

## Work Element 161: Disseminate Raw & Summary Data

Data dissemination via the StreamNet web page ([www.streamnet.org](http://www.streamnet.org)) continued throughout the year, with “up” time in excess of 99%. The Internet is the project’s primary means of data dissemination, primarily through the online data query system and the interactive map applications. Additional online sources of data were through ftp, the new Data Store, and direct download from the map and image catalogs. StreamNet partners continued website maintenance and management throughout the year. In addition to Internet data downloads, project partners responded to direct requests for data and information. Staff in the StreamNet agencies responded to just over 1,000 requests for information or assistance during the year (Tables 1, 2 and 3). State government employees made the most requests. Universities, tribal agencies, consultants, federal agencies and the general public also made significant numbers of direct requests. Of the direct requests received, over 700 were fully satisfied, and 43 were only partially satisfied. In a few cases we could only refer people to other sources of information, and some we could not help at all. Inability to help stemmed from the questions posed being inappropriate or irrelevant for the kind of information in our project. Specific actions by the StreamNet partners included:

### PSMFC

- continued to improve the web mapping applications
- began implementing the Age data category in the query system
- revised the Independent Data Sets page to create a new “Data Store” where users can obtain data and archive their own data
- worked to clean up and simplify the file structure of the StreamNet website
- responded to 77 direct requests for information or assistance
- continued maintenance and availability of important legacy data such as the Protected Areas, and scanned the unique non-standard reach codes and maps for the Protected Areas into electronic format to preserve them and keep them available with the data.

### IDFG:

- filled 200 direct requests for data in FY-06
- assisted the Idaho Supplementation Studies (BPA project number 198909800) by merging their juvenile trap data into a single database and making web-based reports of the data
- assisted the Collaborative Systemwide Monitoring and Evaluation Project (CSMEP - BPA project number 2003-036-00) by providing technical assistance and oversight to data inventories conducted for the Lemhi River watershed.

### MFWP:

- filled nearly 50 map requests
- acquired the NAIP 2004 and Homeland Security imagery and produced maps and Access reports to support the FWP/CSKT/BPA land acquisitions and conservation easements to protect critical fisheries habitat along the Flathead and North Fork Flathead Rivers.



#### ODFW:

- StreamNet managed and developed several ODFW websites and interactive map applications to improve agency data flow to users and to StreamNet
- managed its own data dissemination website
- responded to 181 direct information requests
- spent considerable time researching and compiling bull trout monitoring and research information for input to CSMEP
- developed comprehensive instructions for using the CSMEP data inventory application
- later in the year transferred responsibility for operation and maintenance of the CSMEP data inventory application to the Region due to staff vacancies.

#### WDFW:

- submitted two sets of freshwater smolt/adult trap data to the Region for posting in the Data Store
- installed and tested the new installable interface for generating metadata for independent data sets in the Data Store
- reviewed and commented on the Web presence of the newly reformatted StreamNet Data Store
- responded to 95 direct requests for information.

In addition, fish and hydrography GIS layers built and maintained by StreamNet were used by WDFW's Priority Habitats and Species group to respond to 1,011 data requests, involving 3,411 maps and 222 digital datasets.

#### The StreamNet Library at CRITFC:

- maintained its Internet presence through the fishlib.org domain
- provided access to all library materials and services to the Columbia River basin research community, managers and the public
- provided two-way exchange of documents through interlibrary lending protocols
- provided documents through on-demand digitization for those documents not restricted by copyrights.

#### Work Element 118: Coordination

StreamNet members at all levels coordinated with and provided data services to a wide variety of entities in support of data management programs. StreamNet staff continued participation in regional efforts such as PNAMP, NED, CSMEP, creation of a standard regional GIS hydrography, and capture of information generated during subbasin planning. An overview of actions included:

#### The Region at PSMFC

- continued participation in several regional efforts under the FWP in support of improving data flow, including serving on the executive committees for the Northwest Environmental Data-network (NED) and the Pacific Northwest Aquatic Monitoring Partnership (PNAMP)

- developed a proposal to conduct a pilot inventory of monitoring efforts for PNAMP; developed an online input questionnaire, a database and an interactive map output application for the monitoring inventory data; and conducted the pilot monitoring inventory under a second contract
- participated in the Effectiveness Monitoring work group of PNAMP
- continued support for the Collaborative Systemwide Monitoring and Evaluation Project (CSMEP), including accepting responsibility for maintaining the CSMEP data inventory application due to a programmer vacancy in ODFW StreamNet
- provided feedback to NPCC staff for the "High-Level Indicators" being developed
- developed a spreadsheet describing the various regional organizations and projects working on monitoring and data management to help alleviate confusion over relationships among the groups (available at [http://www.streamnet.org/about-sn/project\\_management.html](http://www.streamnet.org/about-sn/project_management.html))
- met with staff from the Oregon Watershed Enhancement Board to assist converting their restoration projects database structure to one similar to the StreamNet model
- participated in several NED meetings regarding capture of the EDT and QHA data that were developed for the subbasin plans, then received and posted for ftp download the EDT and QHA data from CRITFC and NHI, who were contracted to obtain and organize these data
- responded to a request from NOAA-F to evaluate the accuracy of data they obtained from StreamNet for their habitat restoration projects database
- met with the CBFWA anadromous fish managers and discussed how StreamNet could assist in providing data for CBFWA's planned "Status of the Resource" report.

#### CRITFC:

- continued to provide support and information to regional data projects, including development of a thesaurus and definitions for use in navigating the NED portal
- on other funding, worked to obtain input data, including QHA and EDT data, used in the subbasin planning efforts and provided the data for posting on the StreamNet FTP website
- participated in data review workshops sponsored by Ecotrust and the Wild Salmon Center.

#### IDFG

- through its close working relationship with the rest of Idaho Fish and Game, provided guidance and assistance for a number of activities, including data collection and database development projects, to support their programs and create efficiencies in data flow to StreamNet
- participated in meetings with NED regarding data dissemination via the NED Portal.

#### MFWP:

- participated in conference calls and meetings with StreamNet Steering Committee staff and others interested in regional data management on High Level Indicators, RME, MSRT, the NED Data Management Summit, and the Data Management Workshop hosted by CBFWA

- submitted comments on the MSRT priorities to CBFWA and on the Council's Data Center proposal
- coordinated with the Fisheries Division and Montana CBFWA representative on feedback and support during the 07-09 solicitation and data management meetings
- assisted MFWP Fisheries Division in gathering information from biologists on the Fisheries Management Plan, conducting a native fish species survey, planning (involving desired data types, management plan, genetic reporting and tracking, and physical stream survey parameters), assisting with modifications to the division's electronic library, and creating a separate area on the FWP internal website for the division
- continued to be involved in Montana's Comprehensive Fish and Wildlife Conservation Strategy, including modifications to MFISH to monitor plan and identify focus areas.

#### ODFW:

- participated with NED, PNAMP, and CSMEP, including the NED portal design workshop, the Regional Monitoring Partnership conference, the Environmental Data Management Workshop, and the CBFWA Data Priority meeting
- performed ongoing maintenance of the CSMEP web application until responsibility was passed to Regional StreamNet
- reviewed the PNAMP Monitoring and Evaluation Survey online application for errors and omissions
- provided reviews of CBFWA's "StreamNet Derived Data Concept Paper", StreamNet's Data Flow Process whitepaper, and the Columbia River Data Center proposal
- coordinated with Stuart Toshach (NOAA-F), CSMEP, CBFWA and the Oregon Plan Monitoring Team about a new inventory effort called the Salmon Status & Trends Data Mapping Project
- participated in multiple organizations to further common aims for managing and sharing fish and wildlife information
- worked with the ODFW GIS Coordination Group and other internal efforts to further information support
- coordinated with a number of GIS related groups
- continued to coordinate Oregon's effort to develop a statewide barrier inventory database and restoration prioritization system
- evaluated and commented on a NOAA-Fisheries Watershed Information Portal concept; reviewed a proposal for a new monitoring and evaluation project tracking effort, called "Data Management Design for Regional Project Tracking to Support M&E", by Katz, et. al
- met with ODFW Invasive Species and Wildlife Integrity Coordinator to discuss possible ways to help manage and monitor invasive species distribution in Oregon.

#### WDFW:

- loaded additional Methow/Okanogan fish dataset inventory information into the CSMEP web application and loaded nearly 250 records of detailed habitat dataset information into the Excel spreadsheet, and maintained ongoing coordination with CSMEP
- assisted the JSAP Project with FY-06 work plan and budget elements for database work and participated in two meetings to describe the three-year project vision for JSAP data collection, analysis, and dissemination
- facilitated WDFW review of a draft PNAMP Aquatic Monitoring Inventory survey; participated in the PNAMP/NED Data Quality Workshop

- assisted in recruiting, interviewing, and hiring a temporary technician to conduct PNAMP Aquatic Monitoring surveys in Washington state and provided oversight
- and held a conference call for key WDFW data sources in the Walla Walla, Tucannon, and Asotin basins to initiate data compiling for key corporate data categories that have StreamNet relevance.

#### Work Element 99: Outreach and Education

StreamNet project staff members participated in various professional and public venues to inform others about StreamNet data and services and to learn about opportunities to expand acquisition of data. StreamNet's Program Manager and several Steering Committee members participated in the annual meeting of the Organization of Fish and Wildlife Information Managers (OFWIM). Presentations on StreamNet data and capabilities were given, and project members gained significant information about new approaches to managing and disseminating fish and wildlife data. These efforts were accomplished on funding other than the StreamNet contract, with OFWIM paying the costs for the Program Manager, who was serving as OFWIM president. Other highlights included:

#### PSMFC:

- published two editions of the StreamNet Newsletter, available at <http://www.streamnet.org/Newsletter/Newsletters.html>
- updated the StreamNet brochure to reflect current activities and to update contact information. The brochure was distributed at various meetings, and is available on the StreamNet website home page.

#### The StreamNet Library:

- participated in a number of opportunities to market the project to other groups, such as at the Salmon Festival at Oxbow Park and the Salmon 2100 conference
- distributed the Library brochures to interested parties at these meetings.

#### MFWP:

- met with Montana Council members and staff so the Montana StreamNet Manager could introduce herself and the StreamNet project
- redesigned the MFISH web application and programming in ASP.NET is approximately 60% done.

#### ODFW:

- prepared and delivered a presentation on the current and potential functionality of the ODFW IMS site to the Wildlife Division
- presented a brown-bag seminar open to all staff on ODFW's Internet mapping resources
- presented the efforts to date of the GIS Coordination Group to the Information Systems Division
- spoke to a grade school about the salmon life cycle and StreamNet
- sponsored a presentation on LIDAR technology and how it might benefit resource management efforts in the state.

## WDFW

- created a PowerPoint slide on "WDFW Initiatives Supported by the StreamNet Project" and submitted it to the Region for use in a presentation.

### Work Element 119: Manage and Administer Projects

All project members performed routine administrative duties, including supervision, budget management, development of the FY-07-09 proposal and budget, and program guidance. The StreamNet Steering Committee met quarterly throughout the year and provided ongoing advice and guidance to the project, with participation from all partner agencies. PSMFC provided accrual estimates on schedule, as required by the contract.

Significant effort was expended by all project cooperators in developing project proposals for the 2007-2009 FWP Solicitation. A total of five proposals were submitted related to the StreamNet Project. The base StreamNet proposal addressed ongoing operations of the project and also included expanded emphasis on supporting the development and acquisition of StreamNet standard data sets from tribal programs in the Columbia Basin; expanded data content relating to migration barriers, water diversions and fish screens; and increased emphasis on developing automated approaches to speed data transfer from the data collecting agencies to the StreamNet database. In addition, four separate proposals were submitted to address compilation, acquisition and dissemination of data related to specific data types: hatchery releases by individual locations; comprehensive harvest data for sport and commercial in ocean and fresh water; development of conservation data including data for CSMEP; and comprehensive synthesis of habitat restoration project data. Project cooperators participated in review meetings by the Mainstem/Systemwide Review Team (MSRT). Ultimately, all proposals were consolidated during the review process into a single proposal and level-funded at the FY-06 amount, essentially precluding efforts on new types of data or obtaining data from additional sources such as the tribes.

In September a regional Data Management Workshop, hosted by CBFWA, was held to help guide and modify the StreamNet statement of work for FY 07-09 and to prioritize acquisition of data by specific type, given the level funding scenario. This meeting resulted in good participation and discussion, but provided less specific direction on data type priorities than hoped for. It did provide several concrete recommendations that we are pursuing. Reexamination and modification of the FY-07 statement of work was undertaken in response to this meeting, and that work was still ongoing as of the date of this report.

Regional staff conducted administration of the pilot PNAMP Monitoring Inventory project, including direct supervision of the lead technician. ODFW StreamNet supervised the technicians for this work in Oregon. WDFW StreamNet provided support for the technician in Washington, but the Region provided direct supervision of that position.

MFWP StreamNet underwent an infrastructure change, and the StreamNet staff is now part of the Information Management Bureau within the Information Services Division of FWP.

ODFW StreamNet was severely impacted by the loss of both programmers early in the second quarter of the year, and the loss of the Data Analyst during the fourth quarter. However, other positions were filled: the Library Technician position in April, and a non-StreamNet GIS Tech/Cartographer position in January. Efforts to adjust the classification of the two long-term vacancies continued through the end of the fiscal year, in the hope that a reclassification will improve ability to recruit and retain qualified employees.

WDFW hosted a meeting in Olympia in December for six WDFW managers and the StreamNet Program Manager. Current StreamNet work and strategic targeting of future efforts were discussed. For some it was their introduction to the StreamNet Project at WDFW; they found the discussion lively and relevant to current WDFW needs. WDFW also spent considerable time writing Job Analysis, Position Descriptions, and Performance and Development Plans for staff in compliance with new agency requirements for employee evaluation. The Project Manager also worked with Fish Program leads and WDFW Personnel to successfully promote the Data Manager to a level more accurately reflecting his agency and StreamNet responsibilities.

#### Work Element 141: Produce Status Report

The StreamNet project submitted all four required Pisces Status Reports for the year. In addition, we published detailed quarterly progress reports for the fourth quarter of FY-05 and the first quarter of FY-06 as we have routinely done in past years. However, since the less detailed Pisces reports are mandatory, and based on a recommendation from BPA, we changed our approach and eliminated further detailed quarterly reports and will instead provide that level of detail in this and future annual reports.

#### Work Element 132: Produce Annual Report

The annual report for FY-05 was written and submitted to BPA. This was an overview report published as a brochure. Future annual reports will be designed to provide much greater detail to make up for the cancellation of detailed quarterly reporting.

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### **Detailed Accomplishments**

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Specific details of work accomplished by the StreamNet Project during Fiscal Year 2006 are presented below. Actions are summarized at the Work Element Title level.

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## Work Element: 159 Submit/Acquire Data

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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 During Fiscal Year 2006

**MFWP** Meetings to collect fisheries survey data from state and federal fisheries biologists were completed in the first quarter; data were gathering mostly in electronic form.

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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 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.

Project Accomplishments During Fiscal Year 2006

**IDFG** After searching all the IDFG databases, no new updates to the anadromous fish distributions in Idaho were available.

**ODFW** Routine maintenance was performed all year. We updated South Santiam spring Chinook and winter steelhead distribution, and acquired distribution datasets from existing field projects, which will help with future development of a "presumed historic" component to the distribution data. Federal ESA status information was updated for coastal coho distribution records. We converted the data into the exchange format, performed quality assurance checks and exchanged new and updated records.

**WDFW** Washington state 1:24,000 resolution anadromous fish distribution and use data were transferred to the most recent version of WDFW's stream hydrography layer early in the year, to be in position to exchange these data with the StreamNet database. However, the Washington "mixed-scale hydrography" layer had to be completed first, which involved working to StreamNet's specifications and synchronizing linework and measures with Idaho and Oregon for "border" streams. The fish data were re-loaded several times following discovery of stream identifier, topology, or attribute transfer errors in the hydrography layer. Finally in September, the mixed-scale hydrography issues were resolved, the GIS Data Manager rebuilt the fish distribution one last time, the Location Data Manager quality checked the data, ran final StreamNet tabular preparation routines and submitted the data and documentation.

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**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.

Project Accomplishments During Fiscal Year 2006

**IDFG** Updates were made to the westslope Cutthroat and Yellowstone Cutthroat distributions in Idaho and submitted to PSMFC.

**MFWP** 1,615 fisheries distribution records were created or edited and 10,410 fish survey records were added or updated from the 2005 field season. In addition, we assisted with the Yellowstone Cutthroat Assessment by providing reports, maps and participating in the meetings in Idaho Falls and Billings.

**ODFW** Existing data were maintained throughout the year. We pursued and evaluated existing observation records for native non-game observations from the Oregon Natural Heritage Information Center. We acquired distribution datasets from existing field projects, which will help with future development of a "presumed historic" component to the distribution data. We acquired fish presence digital data from the Oregon Dept. of Forestry for certain watersheds in the Willamette subbasin, and explored issues where the digital data differed from the hardcopy maps. These efforts will contribute to future resident fish distribution development.

**WDFW** Initial transfer of the WDFW resident PHS (Priority Habitat Species) fish information from the current WDFW 1:24,000 scale hydrography layer to the new Washington streams mixed scale hydrography layer was completed and reviewed for the Columbia Basin and the remainder of Washington State early in the year. Updates were entered for bull trout during the year as a result of the new EPA Water Quality Rules along with additional adjustments due to error correction and other new information. The Location Data Manager continued work on bull trout distribution data cross-border issues with ODFW StreamNet in the Walla Walla sub-basin. Final transfer and delivery of the bull trout data to PSMFC is delayed until FY2007 since the mixed scale hydrography was finalized and submitted so late in FY2006.

The 1998 version of West slope cutthroat was transferred to the mixed scale hydrography. Although the internal WDFW dataset now includes both coastal and West slope cutthroat trout fish distribution data, these data were excluded from the late year fish distribution data submission because we were concerned about the adequacy of coverage. In September, we started a new series of field mapping work sessions to create a more comprehensive and up-to-date dataset for these fish.

The steelhead listing decision did not require an immediate rainbow trout data field review for Washington state. Although the internal WDFW dataset currently includes some rainbow trout fish distribution data, these data were excluded from the late year data submission because we were concerned about the adequacy of coverage. In September, we started a new series of field mapping work sessions to create a more comprehensive and up-to-date dataset for these fish.



**Title: 4 Develop data for adult abundance in the wild**

**Description:** Develop and maintain (update) 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. These are lower priority under base funding. Updated data will be exchanged with the regional StreamNet database at PSMFC at least once per year.

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

Project Accomplishments During Fiscal Year 2006

**CRITFC** We maintained and updated 120 Columbia and Snake River dam count trends and 6 redd count trends in the Yakima River. Data were exchanged to the StreamNet system in the fourth quarter.

**IDFG** We completed a review of the Idaho redd count trends and data. An update was submitted to PSMFC that replaced all the existing IDFG records in the StreamNet database. The Idaho redd count data now include more detailed data by individual transect, not rolled up by entire streams. We also included a number of non-index redd counts. Our trend count increased from fewer than 100 to 755.

We also compiled most of the 2005 redd count data, but did not receive some required data, therefore submission of these were not made. Submission will occur in 2007.

**MFWP** 10,410 fish survey records were added or updated from the 2005 field season.

**ODFW** Data compilation, trend updates, & QA/QC efforts continued in Oregon throughout the year, with focused QA/QC efforts from FY-06 being completed during the first quarter of this fiscal year. Updates were submitted to Regional StreamNet in April, June, July, and August, amounting to nearly 1,800 updated trends, including 201 new trends. The updated trends were in the following data types: Adult Return Dam/Weir counts, Adult Return-Estimates of Spawning Population, Adult Return-Redd counts, Adult Return-Peak/Other Spawning Counts, and Harvest-Freshwater/Estuary. The year's work brings the total number of Oregon abundance trends to 7,633 spanning the years 1938 through 2006.

**WDFW** The Vancouver data compiler compiled and exchanged all 2004 natural spawn escapement data and began collection of 2005 escapement data. In addition, 7,023 individual historical stream survey records were entered into the new standardized stream survey card database. The Cedar Creek adult trap dataset was expanded with addition of 1,575 new records, and the data (and metadata) were formatted and sent to PSMFC-StreamNet for loading onto the Independent Data Sets page. In an effort to improve our data compilation efforts in eastern Washington, the Olympia Data Compiler performed a survey of WDFW and other relevant natural resource agency personnel in WDFW Regions 1, 2 and 3. Protocols and forms for spawning ground escapement data collection were requested from each contact, and a series of late June meetings took place with WDFW staff in Regions 1 and 2 to obtain actual current and historical escapement data.

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Work Element: 159 Submit/Acquire Data

**Title: 5 Develop hatchery release data**

**Description:** The hatchery release data category is currently undergoing revision by the StreamNet project. Release data have in the past been obtained from the Regional Mark Information System (RMIS). However, a significant number of release records in RMIS is aggregated into Pacific Salmon Commission codes, which combine ("roll up") multiple locations and release dates so the data can not be assigned a specific release location. StreamNet is in the process of obtaining hatchery release information based on individual release locations and times. During this year, we will initiate a new system of obtaining release data directly from the management agencies and make them available regionally as soon as possible, although some individual release locations may not be available this year. Release data for resident species under base funding will be developed only where the data are readily available (primarily Montana). Efforts will be made to complete cross references between PSC release codes and LLID stream location identifiers. This is a high priority data set.

**Deliverable:** The Oregon, Washington, Idaho and FWS StreamNet cooperators obtain available individual hatchery release data for anadromous fish before being rolled up into PSC codes. These data are exchanged with the central database at PSMFC, where they are organized for public dissemination.

Project Accomplishments During Fiscal Year 2006

**FWS** Hatchery release data for the National Fish Hatcheries for calendar years 2005 and 2006 were received, corrected and loaded into the CRiS site.

**IDFG** We located and georeferenced all anadromous release sites and most resident release sites. However, the actual release numbers for these sites were not compiled and were deferred due to other priorities and a lack of resources.

**MFWP** There was no DEF developed for resident hatchery release data during the year, so no data delivery was possible, and Montana has not provided these data as an independent dataset.

**ODFW** Due to prolonged vacancies, this task was removed from the FY-06 work statement through a contract amendment in June.

**WDFW** Per request from the StreamNet Regional Data Manager, the Location Data Manager submitted unrolled hatchery release data for anadromous fish (without a conversion) to PSMFC-StreamNet. No further activity took place on this data category. The resident fish stocking DEF work was not completed, so no data compilation and exchange took place this year. Washington's mixed-scale hydrography lakes data need significant work before stocking sites can be unambiguously identified; this work is scheduled for FY-07.

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Work Element: 159 Submit/Acquire Data

**Title: 6 Develop hatchery return data**

**Description:** Develop and maintain (update) 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 2003. 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 high priority data set.

**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 During Fiscal Year 2006

**FWS** Hatchery return and age information for the national fish hatcheries for 2005 and 2006 were received, processed, added to the CRiS Returns file, and submitted to the StreamNet database in the Data Exchange Format.

- IDFG** The 2005 hatchery return data were compiled. All hatchery return data were migrated into the new DEF structure, but work to review them was not completed due to the resignation of our database analyst, who was required in order to complete the review, preventing submission to the Region.
- ODFW** Due to prolonged vacancies, this task was removed from the FY-06 work statement through a contract amendment in June.
- WDFW** 299 updated hatchery returns records were exchanged at the start of the year to complete the data exchange for 2004-2005. During the year, QA routines identified a large number of historical accounting errors, so 114 new records and 135 updated records were exchanged as well. WDFW Hatchery Data staff in Headquarters were under-staffed this year, and data entry of the 2005-2006 records was delayed by 4 months. Compilation, QA and conversion of these records began late in the year, but a final submission of 2005-2006 data has been delayed until FY-07.
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Work Element: 159 Submit/Acquire Data

**Title: 7 Develop dam and fish passage facility data (mid-priority)**

**Description:** Data on dam and fish passage facilities will be maintained and updated as necessary and possible by each of the state StreamNet sub-projects. Updated data will be exchanged with the regional StreamNet database at PSMFC. This is a key data set, but mid priority for update under base level funding.

**Deliverable:** Data on dam and fish passage facilities are maintained and updated by the state StreamNet sub-projects. Updated data are exchanged with the main StreamNet database at PSMFC.

Project Accomplishments During Fiscal Year 2006

**IDFG** No updates were necessary for dam and fish passage data.

**MFWP** Dam facilities data were exchanged in the fourth quarter.

**ODFW** Initial effort during the first quarter focused on improving the quality of existing information rather than updating or adding to the existing data. We also assigned general passage status for those major (> 50 ft high) and minor (< 50 ft high) dams that had been coded with a fish passage status of "unknown", based on evaluation of written documentation and input from field biologists. This effort focused on the Lower Columbia, Willamette, Hood/Deschutes and John Day basins. Fifty-nine new dam records were submitted to Regional StreamNet in March.

**WDFW** In January, the Location Data Manager and the Olympia Data Compiler met with WDFW Habitat and IS staff to discuss long-range data sharing and compiling responsibilities for internal WDFW Dam data. Habitat staff do not carry some of the descriptive attributes desired for StreamNet data exchange in their basic database. Despite this, 649 dam records were compiled and converted for exchange. However, delivery of these data to PSMFC is delayed until FY-07 since the mixed scale hydrography, required for generating consistent site information, was finalized and submitted so late in FY-06.

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Work Element: 159 Submit/Acquire Data

**Title: 8 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 as necessary and exchanged to the regional database at PSMFC. This is a high priority data set.

**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.

Project Accomplishments During Fiscal Year 2006

**FWS** Staff changes at the national fish hatcheries were captured and submitted to the StreamNet database in the Data Exchange Format.

- IDFG** No updates were necessary for our hatchery facility data.
- MFWP** Three hatchery facility records were updated during the fourth quarter. Hatchery facility data were exchanged in the fourth quarter.
- ODFW** Oregon's hatchery facilities GIS dataset was improved by updating latitude, longitude, LLID and measure information for 86 hatchery facilities in the Hatchery table, and updating the managers for 17 facilities. We converted these data into the exchange format, performed quality assurance checks and submitted new and updated records to Regional StreamNet.
- WDFW** The Location Data Manager worked out a better way to store and document hatchery, dam, trap and all related point information in a single ArcGIS geodatabase. StreamNet Hatchery DEF improvements need to be made to better share this information with the StreamNet database and relevant PSMFC staff recently agreed to finalize necessary changes. However, a submission of the Washington data was not made because work on the mixed scale streams hydrography layer took precedence. The HatcheryxProduction table needs to be updated only after submission of new or changed hatchery facility data has taken place.
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Work Element: 159 Submit/Acquire Data

**Title: 9 Develop harvest data**

**Description:** StreamNet has traditionally posted harvest data from in-river sport fisheries. This will continue in FY-06, but we will also explore the availability of ocean / commercial harvest data as estimated by others and determine whether these data can be realistically obtained and standardized for regional distribution. Higher priority is assigned to anadromous species. Updated data will be exchanged to the regional StreamNet database at PSMFC.

**Deliverable:** Data on in river sport harvest of anadromous species are maintained and updated as possible by the state StreamNet sub-projects. Updated data are exchanged with the main StreamNet database at PSMFC. Availability and format of ocean / commercial harvest data are evaluated for future development.

Project Accomplishments During Fiscal Year 2006

- IDFG** No work was completed on harvest data due to other priorities and a lack of time and resources.
- ODFW** Effort during the first quarter of the year focused on improving the quality of existing information rather than updating or adding to the existing data. In April, OR submitted updated/corrected information on 873 freshwater harvest trends. Work in the last two quarters of the year focused on acquiring updated information for Oregon's harvest trends, which remained unavailable through the end of the year.
- WDFW** No commercial harvest data scoping was performed this year by the Data Manager to free him to focus on the higher priority sport harvest data. The Location Data Manager focused on cross-referencing commercial harvest locations, reconciling confusing PSC location code descriptions and usage, and revamping the marine area polygon file. We also await a final Steering Committee decision on whether such harvest needs to be stock-based or not, which makes a big difference in compile-and-conversion time.

Considerable time was spent this year by the Data Manager compiling Columbia River sport harvest data for salmon and steelhead. These data are approximately 90% complete. Most harvest estimates are current through 2004, although some are only available through the 2003 return year. Work continues on cross referencing PSC location codes with standardized Location IDs. Once the Location IDs are completed, these data will be loaded into the WA master Escapement data base and delivered to PSMFC. The Location Data Manager has spent a considerable amount of time this year working on these harvest locations.

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**Title:** 10 **Develop hydrography data**

**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-06 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 an intermediate step toward the eventual conversion to 24K when a regionally consistent routed 24K hydrography becomes available from other entities (potentially several years away).

**Deliverable:** The 1:100,000 PNW hydrography layer is maintained and updated as needed for internal use and posted on the StreamNet website for use by others. An interim "mixed scale" (100K X 24K) hydrography for use in posting StreamNet data is developed for StreamNet use until the PNW 1:24,000 scale NHD is completed by USGS.

**Project** Accomplishments During Fiscal Year 2006

**IDFG** Streams for the upper Snake River watershed in Wyoming and the Bear River watershed in Utah were added to the 100K hydrography. IDFG biologists commonly conduct work in these areas outside Idaho and the data are relevant to studies in the entirety of these watersheds. More edits and additions were made to both the streams and lakes as requested by IDFG biologists. Additional work is necessary before submission of these changes to PSMFC for inclusion in the regional hydrography and should be made in FY-07.

**MFWP** The 1:24 K hydrography layer made considerable progress in Montana through meetings with interested state and federal staff working on the NHD and completion of all the Montana HUCs, allowing editing on the completed layer to begin in the fourth quarter.

**ODFW** We performed routine maintenance as needed and coordinated with Regional StreamNet staff throughout the year. We worked with WDFW to address cross-state hydrography anomalies focusing on location and accuracy of observation data occurring on the same streams.

We continued to participate in efforts to enhance the regional 100k hydro dataset with 24k stream routes, including; attending Framework Hydrography Clearinghouse meetings, coordinating with the Hydro Framework to store LLIDs alongside NHD routes, and developing and testing a methodology for converting 100k event data to the 24k Framework hydrography. Following a test phase, Oregon's 100k and 24k coho and winter Steelhead distribution data were converted to the Framework hydro template for the Willamette basin. A hydrography data standard which includes an approach that will work for all project participants still needs to be developed.

**Region** The Regional GIS Specialist coordinated with WDFW to prepare their 1:24,000 scale hydrography for inclusion into a regional mixed-scale hydrography (MSHD) layer. This new base layer includes all named 1:24,000 streams in Washington and those unnamed streams for which the agency has fish data. WDFW submitted its hydrography at the end of the fourth quarter. Regional staff will review and integrate the WDFW hydrography with the existing 1:100,000 hydrography for neighboring states at the regional level in FY-07. To keep abreast of hydrography related developments in the region, the Regional GIS Specialist attended meetings of the Pacific Northwest Hydrography Clearinghouse partners with particular interest in promoting the preservation and maintenance of a unique whole stream identifier (LLID) at the regional level. StreamNet was also represented at locally sponsored workshops related to the emerging 1:24,000 National Hydrography Dataset (NHD).

**WDFW** At the start of the year, the WDFW GIS Manager completed the first draft of the streams mixed scale hydrography (MSH) layer for the Washington portion of the Columbia Basin plus the remainder of Washington State. It includes all 1:100,000 scale streams, plus all additional 1:24,000 scale named streams, plus all 1:24,000 scale streams with StreamNet data. The layer was edge matched with the border 1:100,000 scale HUCs of Oregon and Washington. The starting point of the Columbia River was adjusted to align with Buoy Ten. In addition, the layer has been adjusted in places to match the latest available version of the orthographic photos. Then the Location Data Manager ran QA routines to identify issues with the statewide linework and worked on resolving issues found. We discovered that we were using "old" linework for the Idaho and Oregon portions adjacent to the Washington border, so parts were rebuilt and re-checked. Finally, in late September, the GIS Manager prepared and delivered a CD of the streams MSH layer packaged in separate HUCs to the StreamNet Regional GIS Manager. In addition, the Location Data Manager worked on cross-referencing LLID stream codes with Washington's Stream Catalog codes for Columbia River named streams in order to cross-walk existing data to the Washington StreamNet MSH layer. This work was nearly completed by the end of the year.

Prompted by a data request, the Location Data Manager started researching the current display of Lakes on SalmonScape (WDFW's public website). This highlighted ways to change the web display to clarify differences between the GNIS lake names and our biologists' name expectations. A lake update was not prepared this year because the streams mixed scale hydrography submittal took priority; all attention was focused on resolving the stream layer issues. As we use the existing WDFW lake layer, periodically we collect points to show where a lake clearly shows on the orthophotos yet isn't represented in the lake layer. We anticipate incorporating these points and creating a companion "lakes" mixed scale hydrography layer during FY-07.

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Work Element: 159 Submit/Acquire Data

**Title:** 11 **Develop data to track habitat restoration / improvement projects**

**Description:** Preliminary work has been completed on developing data related to habitat restoration and improvement projects, but regional priority has not been assigned to StreamNet for developing these data. Even though we have developed an improved DEF for these data, this now is a low priority data type under current base funding. We are ready should a higher priority be assigned by regional entities. We believe that there is not yet a comprehensive compilation of all of this kind of data in the region, and we suggest that a project be tasked with obtaining this information from the many sources of such data, including OWEB, WSRFB, US Forest Service, BLM, tribes, and the PCSRF database, updating it annually, and providing it in a regionally standardized format.

**Deliverable:** Existing data on habitat restoration / improvement projects are maintained.

**Project** Accomplishments During Fiscal Year 2006

**CRITFC** Staff worked with CBFWA and the Pacific Coast Salmon Restoration Fund to develop a test project dataset that is compatible with the subbasin plan data archive. This work can contribute to a basin wide discussion should these data become a higher priority.

**MFWP** Most of the nearly 700 restoration projects in the FWP Restoration Project Database were updated in order for invoices to be reconciled with the FWP counting system. Approximately 70 new projects were entered. In addition, StreamNet staff provided the FWP restoration edit/entry system and database to DNRC, M, and Blackfoot Challenge in February.

**ODFW** One Oregon StreamNet staff person met with OWEB staff to discuss making a large portion of their data available via the IMS sites. However, the development of Oregon's Conservation Action Registry made an effort like this duplicative. Therefore this was not pursued further. The development of the Conservation Action Registry continued throughout the year using non-StreamNet funding. No other maintenance on habitat restoration / improvement projects became necessary during the year.

**WDFW** Four habitat restoration funding programs within WDFW were identified and assessed for their current data storage methods. The numbers of projects that qualify for submission were determined for each program. A meeting with three WDFW habitat restoration programs that indicated an interest in the database took place in December 2005. The Project Manager provided an overview of the regional context for StreamNet. The Data Compiler gave a PowerPoint presentation introducing StreamNet, benefits of a data exchange and a brief introduction to StreamNet's habitat restoration database structure. Discussions concluded that the Washington PRISM database was the best starting point for information on state habitat restoration projects. The Olympia Data Compiler selected 405 completed projects from the PRISM database, converted the data to the StreamNet data exchange format, and submitted the records in late March. The Location Data Manager finalized and submitted documentation and discussion of miscellaneous location issues following the submission of the habitat restoration data.

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Work Element: 159 Submit/Acquire Data

**Title:** 12 **Develop fish barrier data**

**Description:** Develop and maintain data sets for barriers to fish migration. This category is still being organized. Existing data on adult barriers will be maintained and updated as practical and exchanged with the regional database at PSMFC. Other sources of barrier data will be explored. Work on juvenile barriers and culverts will require revisions to the DEF. The primary emphasis is on anadromous species except in non-anadromous areas. This is a low priority data set under current base funding, and will be addressed as time and other priorities allow.

**Deliverable:** Data on fish barriers are maintained and updated by the state StreamNet sub-projects. Updated data are exchanged with the main StreamNet database at PSMFC. New sources of barrier data are located and new, expanded data are obtained.

Project Accomplishments During Fiscal Year 2006

**IDFG** Additional barriers were identified for Yellowstone cutthroat trout, but the data have not yet been released for submission to PSMFC.

**MFWP** 35 barriers were added this Fiscal Year. All existing barriers were named and historic begin and end measures were updated to more closely reflect barrier location. Data were exchanged to the regional StreamNet database in the fourth quarter.

**ODFW** Initial effort focused on improving the quality of existing information rather than updating or adding to the existing data. In March, OR submitted 1,041 Barrier table records with updated passage information. FishBarrier table data were also compiled, converted into the data exchange format, and submitted to Regional StreamNet in August.

Oregon StreamNet also acquired and evaluated region wide USFS culvert data, and sought feedback from the Regional StreamNet GIS Specialist regarding potential locational and attribute accuracy issues with the data.

**WDFW** The data compiler reviewed and evaluated a dataset of Stream Features from the WDFW Fish Passage and Diversion Screening Inventory database. A final selection of 21,160 culvert records, 549 road crossing feature records, 186 tide gate features, and 649 dam records are being formatted for submission to PSMFC StreamNet. A comparison is being made of StreamNet dam records and dam records in the WDFW Fish Passage and Diversion Screening Inventory database to preclude duplication prior to submission. This comparison was not complete at the end of the year, so data exchange will be delayed until FY-07.

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Work Element: 159 Submit/Acquire Data

**Title: 13 Develop juvenile fish data**

**Description:** Develop and maintain information on smolt production (as determined from smolt traps), juvenile abundance (as determined through snorkel, electrofishing, and other surveys), and smolt density model estimates. Primary emphasis will be on maintaining the existing smolt density model data and development of a DEF for these data. The rest of the work for this data category is still under development and will require additional resources to accomplish. This is a low priority data set under current base funding, and will be addressed as time and other priorities allow.

**Deliverable:** Functional on-line data for juvenile abundance or outmigration of anadromous fish species are maintained and publicly available on the StreamNet website through the tabular data query system. Means of obtaining and disseminating more of this type of data are explored.

Project Accomplishments During Fiscal Year 2006

**CRITFC** We maintained and updated 24 smolt trends in the Yakima River. Discussions were held with the other tribes' anadromous fish interests about obtaining their data. Resources are not presently available to begin the work of transferring those data. A draft proposal to develop a pilot program to access these data was developed.

**WDFW** The Vancouver data compiler checked the 2005 smolt trap data sheets and data entry, then transferred the Excel files into the current Access database. Queries were performed to analyze the data sets, build tables, double check numbers and send to Regional Biologists to run population estimates. Our focus then turned to providing interim results from this work to StreamNet, in the absence of a specific Data Exchange Format (DEF) for smolt trap data. The Data Manager incorporated summary data from the Cedar Creek smolt and adult trap data sets into StreamNet's existing EscData DEF as a pilot effort. It was determined that a DEF specific to juvenile (smolt) out-migrant data would be more useful in sharing these data, so IDFG and WDFW agreed to begin the process of developing a separate DEF to accommodate these data. Toward the end of the year, the data compiler began the QA/QC process on 2006 Cedar Creek smolt trap data sheets and data that had been entered.

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Work Element: 159 Submit/Acquire Data

**Title: 14 Develop fish age data**

**Description:** Develop and maintain information on age/sex composition of returning adults, primarily for anadromous species. Emphasis on this data type will increase once the draft DEF is tested and finalized. This is a low priority under current base funding.

**Deliverable:** A means of consistently displaying age data on a regional basis is explored and a data exchange format for these data is adopted.

Project Accomplishments During Fiscal Year 2006

**CRITFC** The adult Age database was maintained and updated in the draft DEF format. Data were sent to the StreamNet database in the fourth quarter.

**FWS** Return and age data from the national fish hatcheries were processed, converted to the StreamNet Data Exchange Format and submitted to the StreamNet database. Spring Chinook and tule Age compositions are being determined.

**IDFG** The 2005 age and sex composition data were compiled. Work to review these data were not completed due to resignation of the database analyst who is required in order to complete the review, preventing submission to the Region.

**ODFW** Age data were compiled and evaluated against the most recent version of the StreamNet DEF, which includes a new Age Data table. Oregon submitted 303 age data records associated with 7 abundance trends to regional StreamNet in June.



**WDFW** 2004-2005 age data for the natural spawn escapement data set were completed and exchanged, with all the necessary corrections made for the new data format. The Data Manager also delivered 770 new age records associated with hatchery returns. The Data Manager met with other WDFW staff about standardizing a scale card database to be used for aging anadromous fish statewide. They discussed the different cards used throughout the state and the different databases where the data are located. Standardization work will be piloted by Headquarters staff in the BDS Unit working in conjunction with WDFD-StreamNet staff. Collection and data entry of summarized 2005-2006 age data was completed by the Vancouver data compiler. Calculations for Lower Columbia River age data by males and females, including the number sampled, mean fork length and standard deviation, were performed for fall Chinook. These data will be exchanged in FY-07.

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Work Element: 159 Submit/Acquire Data

**Title: 15 Develop production factor and run reconstruction data**

**Description:** Develop and maintain information on survival, production factors, spawner / recruit estimates, and run reconstruction. This is a low priority data type under current base funding, but the existing spawner / recruit estimate data will be maintained. Current effort will focus on what aspects of this kind of data are most needed.

**Deliverable:** A means of obtaining and consistently displaying production factor and run reconstruction data on a regional basis is explored, as time permits.

Project [Accomplishments During Fiscal Year 2006](#)

**ODFW** Oregon StreamNet staff requested smolt production and other spawner-recruit data from the data originators. However, the data were not made available to us in July or after as promised, so no data were exchanged with Regional StreamNet this year.

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Work Element: 159 Submit/Acquire Data

**Title: 16 Develop diversion screening data**

**Description:** Explore the availability of data on diversion screening. Capture data on screens as time and other priorities allow. The DEF will need to be finalized before much can be done with this data type. This has been a low priority data set under current base level funding, although NPCC has recently expressed interest in these data.

**Deliverable:** The availability and location of diversion and screening data are explored, and means of obtaining, and displaying them on a regional basis are explored, with available data posted on the StreamNet website or cooperating agency websites.

Project [Accomplishments During Fiscal Year 2006](#)

**IDFG** The existing IDFG diversion screening data were obtained and submitted to PSMFC for comparison to other available data and potential development of a data exchange standard.

**MFWP** There were no updates during FY-06. Some investigation was initiated to look into fish ways and screening projects, finding only 2 fish ways east of the continental divide outside of the Columbia basin. There are some indications that some screening may occur west of the divide and these will be investigated in 2007 and exchanged with StreamNet if these data become available.

**ODFW** The Project Leader met with Fish Screening and Passage Program staff to identify their database development needs in anticipation of sharing this information through StreamNet. Staff vacancies continued to hinder the redesign of the Fish Screen and Passage Program database, therefore no new data were made available this fiscal year.

**WDFW** Detailed data table structures and codes used for screens and water diversions in the WDFW Fish Passage and Diversion Screens Inventory were assembled and provided to the Regional StreamNet Project Biologist to facilitate his cross-state review of diversions data.

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**Title:** 17 **Develop other data sets**

**Description:** On an opportunistic basis, develop other types of data as available or as requested by FWP participants. This relates primarily to data relevant to StreamNet objectives which would be developed by StreamNet cooperators, but can also include 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 (IDS) in native format. Development of other data by StreamNet is a low priority under current base funding. Receiving and posting Independent Data Sets from other entities is a high priority.

**Deliverable:** Other fish related data (other than 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 on the Independent Data Sets page in their native format as submitted.

Project Accomplishments During Fiscal Year 2006

**CRITFC** No work was done on other data sets in FY-06.

**IDFG** No additional data sets were made available for submission to StreamNet as independent data sets.

**MFWP** Genetics data were exchanged in the fourth quarter.

**ODFW** Oregon StreamNet obtained carcass placement counts for the 2004-2005 season and posted them to the ODFW website. We also designed and populated a database of fish stock status information for 69 species management units and 473 distinct populations. The species management unit and population information was derived from the existing GIS coverages. The process of putting these data into a database led to the identification of several discrepancies between the GIS datasets and the Stock Status report. No requests were received during this project period to post independent datasets from Oregon.

**Region** The region obtained barriers data from Region 6 of the US Forest Service (OR and WA), consisting mainly of culverts on USFS lands, and passed them to the ODFW and WDFW StreamNet personnel. This is a potentially useful supplement to existing barriers data because they are on lands where we currently has few data. However, these data are tied to the USFS's 1:24,000 scale transportation GIS layer rather than to the hydrography used by StreamNet. As a result, it is not possible to do an easy translation to the StreamNet format, and significant time will be required.

The Fisheries Biologist assisted Washington StreamNet personnel in submitting a data set for returns of anadromous fishes to the Lewis River basin.

Seven new data sets were added to the Independent Data Sets archive this fiscal year. While the Independent Data Sets archive function is active, functional, and reportedly easy to use, generating interest in archiving data sets has been slow. We believe a region-wide effort beyond StreamNet will be needed to have this service become commonly used. Data sets added this year were:

- 1) A water quality data set for the Duck Valley Indian Reservation (Idaho/Nevada border).
- 2) A macroinvertebrates database from Oregon Department of Environmental Quality. This data set was the result of past efforts by ODEQ and StreamNet to provide region-wide data sharing for macroinvertebrates. Discussions between StreamNet and the Xerces Society resumed on how StreamNet can best help regional sharing of macroinvertebrates data, particularly for non-governmental volunteer groups. We will pursue this at a low level into the future, and aim to create a mechanism for data sharing if one is not created under other auspices.
- 3) Catches at an adult fish trap in the Lewis River basin from WDFW.
- 4) Water temperature data for 2005 from the Nez Perce Soil & Water Conservation District (Idaho).
- 5) 2004 bull trout status reassessment for Washington from WDFW.
- 6) Klickitat River Lyle Falls fish passage data set which was created by WDFW and the Yakama Indian Nation.
- 7] A link from the Independent Data Sets archive was added to the U.S. Fish and Wildlife Service's On-line Digital Media Library.

In addition to the new data listed above, updates to two data sets were received and posted, and updates to the IDS link to Oregon's NRIMP were performed.

In September 2006 the name of the "Independent Data Sets" was changed to the "StreamNet Data Store." Modifications were made to the web site and data submission tool to reflect this change. We also reorganized this portion of the StreamNet web site in order to separate searching for data set archives from submitting data sets to the archive (the "Data Publishing Service").

During the fourth quarter we began efforts toward making all our data resources -- Independent Data Sets, GIS data, and the main StreamNet database -- findable on web "portals" such as the national geospatial one-stop, NBII and the NED Portal. We began to create metadata for data sets that did not have them, and reviewed and updated existing metadata. We also began the process of becoming a metadata server and thus a "node" for these various efforts. This effort was continuing as of the date of this report.

**WDFW** Historical Cedar Creek smolt and adult trap data and metadata were compiled by WDFW, sent to StreamNet, and were posted on the Independent Data Sets page. The Project Manager demonstrated use of the StreamNet Independent Data Sets facility to the JSAP Project (resident fish stock assessment above Grand Coulee Dam) steering committee members at the annual meeting in December. WDFW staff have submitted Independent Data Sets with WDFW JSAP data for all years from 1999 through 2004, with 2005 awaiting completion of the Annual Report. WDFW offered to assist other JSAP participant agencies in generating Independent Data Set submissions of their own, while the complexities of their own Universal Database (UDB) and its Web-accessible status remain under study.

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Work Element: 159 Submit/Acquire Data

**Title: 18 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 During Fiscal Year 2006

**CRITFC** During FY-06, the library added a number of materials through duplicate exchange with other libraries. In addition, the library received substantial donations from private parties, including Inez Hopkins in Boise, Idaho. The collection from Ms. Hopkins was the majority of her personal library collected for approximately 20 years from the Idaho Dept. of Fish and Game as well as other institutions and state agencies on the topics of the Columbia River and Pacific Northwest.

Most participating agencies also submitted reference documents which were added to the library collection and cataloged.

**IDFG** Two reference documents were submitted relating to westslope and Yellowstone cutthroat trout distributions.

**MFWP** 285 references were added or updated during FY-06. Reference data were exchanged in the fourth quarter.

**ODFW** Oregon StreamNet submitted 31 references to the StreamNet Library. Organization and cataloging of the ODFW Library holdings resumed third quarter and continued through the year. A total of 8,374 document titles were added to the Library bibliography. Approximately 8,000 titles remain to be entered.

**WDFW** Reference documents for all data exchanged with StreamNet this year were delivered to the StreamNet Library to be cataloged. Work commenced on compiling references for the 2005-2006 natural spawn escapement and age dataset collections to be exchanged in FY-07.

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## Work Element: 160 Create/Manage/Maintain Database

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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 supporting the tabular and GIS data systems at the regional and cooperating agency levels, including system backup. This is a high priority work element that is essential to proper functioning of the project.

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

Project Accomplishments During Fiscal Year 2006

**CRITFC** Computer systems were maintained and updated as appropriate. No serious computer system problems were encountered in FY-06. The library management software was replaced with Koha, an open source package designed for library cataloging. Conversion took a significant amount of time due to the need to configure and learn how to use it.

**FWS** Computer and database system administration continued. Virus, spyware, and adware protections were updated, along with Microsoft program updates.

**IDFG** Routine system administration, such as operating system updates, backups, and general maintenance, were completed on an ongoing basis. A new database server was obtained and configured, and we began migrating our databases to this new server.

**MFWP** MFWP took over system administration duties for StreamNet staff located at the Montana State Library. GIS administration is still shared between FWP Information Management Bureau staff and NRIS. We are exploring the use of the geodatabase model to manage FWP spatial data.

**ODFW** Oregon performed system maintenance and upgraded hardware and software, as needed. Our natural resource data web server was migrated onto ODFW's secure network; however, web server functionality remained under Oregon StreamNet's control. Additional details pertaining to server access and update protocols were coordinated with agency Information Systems staff. A user-customizable component was created to serve various files over the internet via HTTP rather than FTP. This conversion to an HTTP system allows us to stay in line with ODFW's current policy direction.

GIS license renewal was completed during the second quarter. The loading of 1m DOQ into ArcSDE was piloted. Lack of disk space prevented the complete loading of these data. High quality print functionality was added to Oregon StreamNet IMS applications.

Geodatabase development and management continued during the year. ODFW's Barrier Database was migrated to a fish-related geodatabase during the year. A separate geodatabase was created for storage and more efficient management of wildlife specific data. We also acquired Species Management Unit and Population datasets from the Oregon Plan Monitoring Team and built them into the enterprise fish geodatabase. Domains and relationship classes were developed and maintained in order to insure data integrity and ease of use.

**Region** Routine maintenance occurred on the StreamNet database servers, including new daily, weekly, and monthly backups, and database porting to newer servers. Windows 2000 Server updates were made. One of four central processing units failed on the primary database server; this was replaced under warranty, and the system BIOS was updated to match the stepping speed of the new CPU. Operating system and web server security updates were applied and we migrated to a new internal IT infrastructure successfully with little interruption to the StreamNet web site and tabular data query access and up-time. The GIS System was maintained and all server and client GIS software was upgraded to the latest version (ArcGIS 9.1 sp1).

During FY-06 the primary StreamNet web server was migrated from the Apache 2.x series to Microsoft's Internet Information Services web server software. This will allow smoother integration with our StreamNet partner projects via .NET applications. We should also benefit from more consistent log analysis across web sites and web-based applications. Up-time with the new server software has been at the same high 99.5+% web server availability. New XML output was added to several query data categories improving the system interoperability with StreamNet partners. StreamNet's FTP server software transitioned from an open-source application we had been using for about a year to the Microsoft's FTP server software. The goal is to have better FTP logging and reporting, easier FTP management and security, and the same high-level FTP availability. Late in the fourth quarter we acquired replacement database, web, and ArcIMS servers, and purchased 23 Client Access Licenses for SQL Server 2005 RDBMS. These will be brought on-line in FY-07.

Apache (before the switch to MS-IIS) and ColdFusion updates were applied. We continue to improve web server performance and reduce web errors and problems caused by web robots and attacks.

The Regional Fisheries Biologist was taught how to administer the ftp server software. As more people learn to administer the various parts of the system, greater reliability of the system should result.

**WDFW** Security patches, software patches and Arc GIS upgrades were performed to keep current with new releases and keep current with latest GIS software on all PCs used by StreamNet workers. Paperwork was completed to replace an aging state-leased system with a new leased PC. A GPS and software were purchased to collect points representing sampling sites on the Columbia River mainstem.

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Work Element: 160 Create/Manage/Maintain Database

## **Title: 2 Application and interface development**

**Description:** All StreamNet cooperators will develop and maintain computer applications and interfaces that facilitate the entry, management and dissemination of tabular and GIS data at the regional and subcontracting agency levels. This will include development of new applications and tools as well as maintenance or modification of existing applications.

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

Project Accomplishments During Fiscal Year 2006

**CRITFC** A major effort was undertaken in FY-06 to convert the StreamNet Library catalog system from proprietary to open source software. The conversion was largely completed in FY-06 and will provide significant savings in software license costs that will offset rapidly rising journal subscription costs and other budget erosion due to inflation and level funding limits over the last several years.

Internally, we are developing new data entry and reporting applications to improve the documentation (meta-data) and QA/QC procedures for handling Age data.

**FWS** The CRiS Age programs were updated to meet new printer limitations, and CRiS PondInv programs were updated to handle the use of PIT tags.

**IDFG** In collaboration with the IDFG Fisheries staff, we started two new database/application development projects to capture and manage data. One was to modify an existing Spawning Ground Survey for a single project and expand it to capture all spawning ground survey data in Idaho. The other was to develop a statewide hatchery data management system (using non-StreamNet funding, but with direct relevance to StreamNet). The first step is the adult trapping portion. Next will be the rearing component then finally the release component. The intent is to replace our current method of compiling data for StreamNet (wait for published reports and harvest and reenter the information) with a system that will automatically harvest StreamNet data directly from these databases. This will provided for much more accurate, more efficient and more complete submission of data to StreamNet.

**MFWP** We developed an instream measurements table and user interface, and entered 8,000 records. We are exploring the possibility of managing amphibian and reptile data collected during fish survey work in the MFWP database.

**ODFW** Development and/or maintenance of applications and interfaces this year focused on migrating Oregon's Web Application Development Framework from using MySQL to SQL Server as its database store and the WebFX framework as its development platform. Most applications were migrated during the year, including the Barrier database, Library Bibliography web application, Recovery Planning Data Library, and the Oregon Data Clearinghouse (an online statewide data repository). This migration effort, coupled with prolonged staff vacancies during the last two quarters of the year, precluded most other planned development efforts. Other applications and interfaces were maintained throughout the year. Of note, the public land survey system Township, Range and Section layer was added to the orthoimagery IMS site to improve reference layers for viewing the imagery.

Activities related to development of a production data web application were limited to discussions and documentation of needs with ODFW production staff during the second quarter.

Development of an online ODFW fish presence-related data application was initiated with meetings and discussions during the first quarter. Discussions focused on an application for facilitating change requests to the Fish Habitat Distribution data. A software requirements document was completed for the distribution update component. This document spells out the purpose, scope, functional requirements and planned rollout for the application. Planning discussions also occurred for other online data tools. However, because of the SQL migration and prolonged staff vacancies during the last two quarters of the year, funding for these efforts was re-budgeted via CCR to compiling bull trout data in support of CSMEP.

We created a marine geodatabase on the data server within ArcSDE. The purpose of this database is to enable the marine program staff to test storage and use of large spatial datasets on a central server located in Salem. This could potentially solve a number of issues that the marine program is experiencing with their need to access data from multiple locations. It may also address issues that ISD has in regards to backup of the marine program's GIS data

**Region** The existing LLID/NHD conversion tool is now available upon request. This tool or a similar application is being considered as part of the migration path to a higher resolution nationally standard routed hydrography. Development of an online Event Mapper was researched but would require an ArcGIS Server software license which is currently cost prohibitive. In the meantime, StreamNet at the regional level is able to share pooled licenses of ArcGIS desktop software to cooperators who lack the required capability.

The web query system was updated for several data categories, including Hatchery Returns, to accommodate changes in the DEF. Query system bug fixes and errors were tracked down and fixed including problems arising from incompatible data (errors in data). The tabular query system was updated to better alert us when incompatible data errors are encountered.

A data entry application was designed, tested, and brought on-line to support the PNAMP Monitoring Inventory project. A basic map-based output and reporting system for the PNAMP monitoring inventory was also developed as part of this pilot effort

Work to update map application to tabular query links and vise-versa was done and updated, and new functionality will be live in FY-07.

Display of age data was pursued, but not completed. The format for displaying these data was determined, but implementation did not occur by year end

**WDFW** Work started on the development of a new internal GIS user interface system with support software for management of the new mixed scale hydrography and related StreamNet data. This system will allow for easier access to the layers via the HUC or the Washington WRIA code and will provide for automated data release to WDFW users in coverage or shape file format.

A new system for capturing field updates of fish distribution and use data using ArcView on laptop computers was designed, implemented, and successfully tested at a mapping work session for priority resident fish in Northeast Washington. Current data are projected onto a screen over orthographic and USGS Quad image files, changes or corrections are made in consultation with the attending biologists, and updates are instantly transferred to the corporate databases located in the Olympia headquarters office. This system will save the cost and time of generating dozens of large-format maps for each mapping work session.

The Location Data Manager began working with the Python scripting language, and subsequently created Python programs to concatenate the more complete internal 24K hydrography linework stored in 67 pseudo-drainage units. This more comprehensive linework was used to augment the mixed scale hydrography as needed to tie streams to more data; the ability to quickly concatenate the linework will continually be needed in maintenance of this key spatial database.

WDFW StreamNet staff also participated in an XML work session at PSMFC designed to explore what role XML might play in more efficient data exchange.

A storage facility that meets DEF standards was created to house sport harvest data in MS Access. Data entry forms and viewing forms were created for these data as part of this year's pilot effort in this category.

The Location Data Manager worked on a design for the marine area polygon layer which would allow easier comparisons of the sport versus commercial area differences in anticipation of future work with commercial harvest data.

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Work Element: 160 Create/Manage/Maintain Database

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

**Description:** The StreamNet project will manage data at the regional and subcontracting agency levels to assure timely and accurate data flow from source to final distribution. Activities include exchange of data to PSMFC, data loading, updating data, quality assurance procedures, metadata development, etc.

**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.

Project Accomplishments During Fiscal Year 2006

**CRITFC** Staff are gradually updating data handling applications and procedures to improve documentation, quality, and sharing capacity as time and funding allow. Databases will be migrated into an EPA-consistent environment. Plans have been made to test new automated sharing procedures for the salmon age data between CRITFC and StreamNet.

**FWS** QA/QC was performed on Returns and Age data. These checks are built into processing programs, and are performed upon review of output. New checks on coded-wire tag data and related species and age information were added to CRiS programs.

**IDFG** A review of all Idaho redd count trends and redd count data was completed. A key element of this review was to report redd count data by individual transect, rather than the previous roll up to entire streams. We also captured non-index redd counts that we previously did not report. The result was to increase the number of trends that we report from fewer than 100 to 755. We also made additional quality assurance reviews of our carcass data in anticipation of submitting them to the Region.

Our database analyst resigned during this year. He held the lead for our database design and maintenance, as well as the lead on our programming staff. The loss created a tremendous delay in our ability to develop and review other data.

**MFWP** Internal data maintenance and management were performed. All data were exchanged to the regional StreamNet database in the fourth quarter.

**ODFW** ODFW's Barrier Database structure was modified to facilitate the tracking of multiple references for each barrier record (e.g. one for the original record creation and a second which describes passage). This also required a modification of the Reference database. Staff coordinated with Regional StreamNet on the Barrier Database changes, and to rectify discrepancies that were discovered during routine QA/QC processes.

A quality assurance review was performed on ODFW's Stock Status database. We also revisited the issue of incorrect usetype mapping within some reservoirs on the Clackamas River, and reviewed portions of the Distribution Update Protocol to ensure all change are addressed.

Oregon StreamNet acquired 1m color mosaic orthophotos by county for the state of Oregon.

Significant effort was spent during the first two quarters of the year ensuring the data quality (correctness and consistency across the years of data availability) of Oregon's existing StreamNet Trend information, executing quality control queries on the trend database and fixing any resulting trend errors (such as non-consecutive Escape Data Begin/End Dates, erroneous survey distance, reference discrepancies, etc.). These efforts resulted in trend corrections being sent to Regional StreamNet. With each data submission, we worked with Regional StreamNet staff to ensure exchange compliance. Oregon StreamNet's Quality Assurance/Control draft document was also updated to reflect lessons learned during this effort.

Metadata were updated for a number of datasets including Bull Trout and Lahontan cutthroat trout distribution, hatcheries, facilities and ODFW boundaries.

**Region** The GIS Specialist, Fisheries Biologist, and Regional Data Manager met with the WDFW StreamNet technical staff in Olympia to discuss data compiling schedules and issues impacting data entry, formatting and quality control.

The Regional Fisheries Biologist assisted Washington with development of a database template for capturing habitat restoration project data that meet the StreamNet data exchange format. The template was modified from an initial effort created by Montana that did not quite meet DEF requirements.

Major efforts occurred this fiscal year regarding age data. The Regional Fisheries Biologist assisted personnel from ODFW, USFWS, and CRITFC with interpretation of the age data DEF. Major efforts were made toward implementing delivery of age data via the web query system.

Regional personnel assisted WDFW with conversion of PRISM (habitat improvement project) data to StreamNet format. Regional personnel assisted the Oregon Watershed Enhancement Board with their database structure conversion.

Over 500 Barrier records submitted without names were named by concatenating the barrier type (e.g. "Unnamed falls") with the actual BarrierID that identifies the particular structure.

At the regional level, hatchery and dam facilities were checked for locational accuracy and improvements were made. Updates will be reflected in FY-07.



Data submitted to the region were included in the GIS library and cross referenced to enable spatial filtering via the web query system. Where appropriate, these data were added to the ArcIMS applications and the library of downloadable GIS layers. For example, fish distribution spatial datasets were updated for download and use in interactive map applications. Links to the fish distribution interactive mapper from the GIS data download page and from the online query system were updated. The regional spatial database was expanded to include improved base map layers to support ArcIMS sites. The Regional GIS specialist continued to attend meetings related to the regional coordination of spatial data and services, including meetings of the Regional Geographic Information Council (RGIC), the Pacific Northwest Hydrography Framework, and the Northwest Environmental Data-network (NED). An ArcIMS metadata service for publishing StreamNet and "Data Store" metadata to regional and national portals was developed and published this year. This service makes FGDC compliant metadata available in a format that can be readily integrated into national and regional information "portals," such as those managed by "Geospatial One-Stop" (GOS), the National Biological Information Infrastructure (NBII), and the Northwest Environmental Data-Network (NED).

Data loaded included over 4,200 new references cataloged into the Reference table related to data records (a 48% increase), over 7,700 new escapement count records, almost 1,600 new barrier records, over 5,000 new fish distribution records, about 1,350 new hatchery disposition records, over 4,500 new restoration projects with extensive related details, and the addition of about 1,000 new time series ("trends"). In addition to new data records, IDFG submitted an entire replacement of Chinook and steelhead redd count data in Idaho comprising over 6,700 records identifying redd counts by specific locational transect instead of more general summarizations that had been previously submitted. A considerable effort was made to improve the completeness of location geo-referencing tables that are used by the web query system to filter data searches by state, county, province, subbasin, HUC, etc., and over 50,000 new records were added to location geo-referencing tables. Work was done to improve the quality of information and remove duplicate barriers from the Barrier table. A StreamNet Library data exchange was made.

**WDFW** Changes to current Washington StreamNet data sets that reflect all 2005.1 Data Exchange Format guidelines were performed early in the year. Work was also done to speed the conversion of 2005.1 DEF age data to 2005.2 DEF format as the 2005.1 format did not work for the StreamNet Data Managers. A third set of changes was made in spring 2006 to accommodate changes needed to adhere to the new 2006.1 Data Exchange Format guidelines. The PSMFC StreamNet Data Manager met with WDFW counterparts in Olympia in December 2005 to discuss current data-related issues.

The Stream Catalog codes for San Poil basin in Northeast Washington (WRIA 52) historically have been a problem. More than one code was assigned to some streams and it's not certain which were the true codes to use. The Location Data Manager created a cross-reference of San Poil Basin Stream Catalog codes and LLIDs to educate users about the decisions made in this basin. Columbia Basin cross-coding had not been attempted before because Catalog codes did not come with maps and it was felt it would be impossible to cross-reference to LLIDs. Since the WRIA 52 effort was a success, she also led the effort to start creating a cross-reference for Columbia Basin Stream Catalog codes and LLIDs in the remaining basins. She also started compiling adult trap locations and looking directly at WDFW's Adult Trap database to identify QC issues with the lack of standards in describing sites as "facilities". Finally, she submitted corrections to the Barrier table's Longitude and Latitude fields to coordinate with the representation in the LocMaster table. She finalized documentation and discussion of miscellaneous location issues following the March 2006 submission of the habitat restoration data

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**Title: 4 Data exchange standard development**

**Description:** The project will establish and maintain data exchange standards to ensure 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 DEF version is adopted during the year.

Project Accomplishments During Fiscal Year 2006

**CRITFC** Staff coordinated draft DEF standards and formats for salmon Age data.

**FWS** Discussions on the Age DEF continued. Data structures were changed to conform to the new DEF.

**IDFG** No new data exchange formats were started in FY-06. We participated in discussions regarding the Age DEF.

**MFWP** The newest version of the DEF was reviewed in the third quarter; no major DEF work occurred during FY-06.

**ODFW** Staff reviewed the 2006.1 DEF and worked with Regional StreamNet and other StreamNet partners on issues related to the Age, Fish Survey (Observation), Reference, and Barrier data DEFs during the year.

We worked with Regional StreamNet staff and the StreamNet Steering Committee on the need for some form of sighting information management at a regional level.

**Region** PSMFC received a request from ODFW for 24 new codes to add to the StreamNet species table. The list was reviewed: appropriate codes were added; synonyms were identified; and questionable taxa were sent back for review. All necessary new codes were identified and added.

New codes were added for several portions of the habitat restoration projects data DEF. PSMFC and WDFW worked together to determine how PRISM's "lead entity" maps to the StreamNet concepts for restoration projects. It was determined that PRISM's "lead entity" is equivalent to StreamNet's "watershed council," which is language originally acquired from the Oregon Watershed Enhancement Board.

The inability to reference more than one document has been a short-coming of data exchange since before the original Coordinated Information System (CIS) and Northwest Environment Database (NED) were merged to form the StreamNet project in 1995. A strategy for allowing more than one reference for a record was created this fiscal year. Implementation of this idea occurred in the 2006.1 version of the DEF that was adopted this year. Implementation in the web query system is underway.

The DEF for age data was changed to accommodate data sets that do not have metadata about how raw age data are expanded to populations.

The Region worked with WDFW personnel on updates to location coding for hatchery facilities. This task was not fully completed during the fiscal year.

Version 2006.1 of the StreamNet DEF was completed and published this year. Work to extend the DEF continues. Progress was made toward improving the barriers/diversions/screens DEF, and toward creating a "sightings" DEF. For sightings, contacts with several museums was initiated to determine the types of information commonly collected, and the types of information that are necessary for a quality data set of this type.

Two occurrences complicated work on the "sightings" DEF, however. First, one of the ideas for including this data type in StreamNet would involve a major reorganization of most data categories, and would thus be a very large effort. Second, though this item is in the FY-06 work statement, we were not sure if it would be continued into future years. Because of the potentially major effort this could entail and the potential that we may not pursue this based on funding decisions for next year, we decided to suspend effort until we were certain of our direction. This effort will be re-evaluated for fiscal years 2007 and beyond, but was not pursued in earnest during FY-06.

The Regional Fisheries Biologist contacted EPA staff and signed up to attend an EPA workshop on the statistics for the EMAP process, but the workshop was cancelled. Further efforts were made to investigate the EMAP statistical approach, without success. Understanding the statistical treatment of data under this randomized approach will be necessary before an appropriate DEF can be developed for data collected using this approach.

**WDFW** In February, the Location Data Manager met with StreamNet Regional staff to discuss the Hatchery DEF. Allowing many locations of the same type for each hatchery (i.e. many outflows) is the most radical change discussed. Decisions were not finalized at the Regional level prior to the end of the year, and Washington staff shifted priority onto completing development of the mixed scale hydrography layer.

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## Work Element: 161 Disseminate Raw & Summary Data

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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. We will provide access to StreamNet data products through the Internet at both the regional and cooperating project levels. The StreamNet home page ([www.streamnet.org](http://www.streamnet.org)) will continue to be utilized as the project's primary data delivery vehicle. Priority will be given to incorporating data developed through Work Element 159 and providing access to reference materials secured through Work Element 98. The site will also be used to archive data sets developed by FWP participants for data that do not fit within the StreamNet DEF (Independent Data Sets), including the means to index and search the archive.

**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.

Project [Accomplishments During Fiscal Year 2006](#)

**CRITFC** The library continued to maintain an Internet presence through the fishlib.org domain.

**IDFG** No new reviews of the StreamNet website were needed.

**MFWP** Montana StreamNet does not maintain any agency websites, and no need for corrections or changes to the main StreamNet website were noted.

**ODFW** Functionality-related feedback was provided to Regional StreamNet staff throughout the year based on ongoing review of the StreamNet website.

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.

Oregon StreamNet staff worked with ODFW web developers to prototype a new agency website focused on providing intuitive access to information that users are looking for rather than a site based on the agency's structure.

Oregon StreamNet developed and launched a pilot general purpose ODFW Internet Map Server (IMS) Web site designed to provide ODFW employees with easy access to a variety of agency GIS data in a map format, including to the 2005 Digital Ortho-imagery. Functionality and content were enhanced based on user feedback. Newly updated agency watershed district maps were created and posted to the NRIMP Data Resources page. We also provided a link from NRIMP's site to BPA's Environment, Fish & Wildlife Reports search page.

Because of our system conversion, web statistics were only compiled during the first quarter of the year. For the period of October through December 2005, our web server provided an average of 37,484 page views per month to an average of 3,727 unique IP addresses. The CSMEP site experienced 3,252 page views during this same period. Extrapolation of this information suggests that web site usage was higher this year than previous years. A total of 5,674 files (8.61 gigabytes) were served via FTP download during the first quarter. FTP support was subsequently discontinued due to agency computer access policy.

Staff migrated websites maintained by NRIMP from the old MySQL Web Application Framework into the new WebFX framework, which is based on MS SQL Server, and upgraded user roles to improve the administration of all our websites. Ongoing troubleshooting occurred throughout the year. This conversion included the ODFW Corvallis Research Lab website, which was successfully converted to the new agency framework.

**Region** Data delivery through the StreamNet web page (www.streamnet.org) continued as the primary means of data dissemination throughout the year. Routine ongoing maintenance of all web pages, including the tabular and GIS portions, continued, and the various parts of the website continued to function at a very high rate of reliability, well above 99% "up time."

Work continued to improve the web mapping applications, including the development of new applications for partner projects. Work began on implementing the age data category in the tabular data query system. The StreamNet Independent data sets area of the web site was modified to become the StreamNet "Data Store." Additions were made to the "Fishes Found in Fresh Waters of the Pacific Northwest" web page, using information provided by ODFW. Considerable effort was applied to cleaning up and simplifying the file structure of StreamNet web site which has grown over the past 10 or so years. Old and no longer used areas of the web site were archived. These improvements were done in anticipation of an overall web site update in look, feel, and functionality in the near future.

A link to the Pacific Salmon Commission was added to our links pages.

**WDFW** WDFW StreamNet staff submitted two sets of freshwater smolt/adult trap data to Regional StreamNet staff for posting on the Independent datasets page. Late in the year, we also installed and tested the new installable interface for generating Independent Dataset metadata. We reviewed and commented on the new Web presence of the Independent Datasets, now referred to as the "StreamNet Data Store".

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Work Element: 161 Disseminate Raw & Summary Data

**Title: 2 Respond to data/information requests**

**Description:** Receive and respond to requests for data and information, source materials, and custom products at the regional and cooperating agency levels. 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. Other priorities will include implementation of the Endangered Species Act and federal, state, and tribal natural resource management activities.

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

Project Accomplishments During Fiscal Year 2006

**All** In addition to data dissemination via the StreamNet websites, project cooperators responded to direct requests for information or assistance, as detailed in Tables 1, 2 and 3.

Table 1. Number of responses to direct data/information requests by StreamNet members during FY-06, by type of request

<b>Type of request</b>	<b>IDFG</b>	<b>Library</b>	<b>MFWP</b>	<b>ODFW</b>	<b>PSMFC</b>	<b>WDFW</b>	<b>Total</b>
Data request	147			26	17	26	216
General fish information				3	2	4	9
GIS data / map	41		50	79	14	50	234
Hardware / software technical support	7			26		1	34
Help finding information				10	8	6	24
Help with data interpretation / analysis				5	6	4	15
Help with data structure				2	3		5
Library / Documents	5	398		9	4	4	420
Other				14	8		22
Report error or problem				4	13		17
Citing StreamNet / permission				1	2		3
Beyond StreamNet scope				2			2
<b>Total</b>	<b>200</b>	<b>398</b>	<b>50</b>	<b>181</b>	<b>77</b>	<b>95</b>	<b>1,001</b>

Table 2. Number of responses to direct data/information requests, FY-06, by source of request.

<b>Source of request</b>	<b>IDFG</b>	<b>Library</b>	<b>MFWP</b>	<b>ODFW</b>	<b>PSMFC</b>	<b>WDFW</b>	<b>Total</b>
College / university	3	102		4	7	2	118
General public / other	89	41		9	6	1	146
Government, county / local				2	2	4	8
Government, federal	21	29		12	15	12	89
Government, state	59	33		125	7	42	266
Government, tribal	24	68		1	5	14	112
Nonprofit organization	4			5	8	2	19
Private consultant		64		12	14	14	104
Regional entity		61		5	4	2	72
Watershed council / group				0	2		2
Industry / commercial				1	1		2
Unknown			50*	5	6	2	63
<b>Total</b>	<b>200</b>	<b>398</b>	<b>50</b>	<b>181</b>	<b>77</b>	<b>95</b>	<b>1,001</b>

\* Breakdown not recorded

Table 3. Number of responses to data/information requests during FY-06, by outcome.

<b>Outcome of request</b>	<b>IDFG</b>	<b>Library</b>	<b>MFWP</b>	<b>ODFW</b>	<b>PSMFC</b>	<b>WDFW</b>	<b>Total</b>
Request fully satisfied			50	113	59	86	308
Request partially satisfied				22	13	8	43
Referred to other sources				25	4	1	30
Could not help at all				21	1		22
Breakdown not recorded	200	398*					598
<b>Total</b>	<b>200</b>	<b>398</b>	<b>50</b>	<b>181</b>	<b>77</b>	<b>95</b>	<b>1,001</b>

\* Library requests nearly all fulfilled, either from StreamNet Library or through interlibrary loan.

Work Element: 161 Disseminate Raw & Summary Data

**Title: 3 Provide data and maps to support Fish and Wildlife Program activities**

**Description:** Provide data and maps and related services to the Fish and Wildlife Program, as requested. Services may include custom development of data, provision of data from the StreamNet database to support FWP activities (such as planning, monitoring and evaluation, etc.), and general advice and technical assistance with database management, data delivery, and GIS. Work under this task will have to be based on time available, particularly for larger requests.

**Deliverable:** Requested data and maps are provided to subbasin planners, recovery planners, and other projects funded through the FWP.

Project Accomplishments During Fiscal Year 2006

**IDFG** Idaho StreamNet assisted the Idaho Supplementation Studies (BPA project number 198909800) by merging their juvenile trap data into a single database and making web-based reports of the data.

We also assisted the Collaborative Systemwide Monitoring and Evaluation Project (CSMEP - BPA project number 2003-036-00) by providing technical assistance and oversight to data inventories conducted for the Lemhi River watershed.

**MFWP** Montana StreamNet staff acquired the NAIP 2004 and Homeland Security imagery and produced maps and Access reports to support the FWP/CSKT/BPA land acquisitions and conservation easements to protect critical fisheries habitat along the Flathead and NF Flathead Rivers.

**ODFW** Oregon StreamNet staff entered 65 Grande Ronde spring Chinook data records into the CSMEP database, corrected minor mistakes in existing records, and discussed needed improvements to the existing application with ODFW CSMEP biologists. While general needs were expressed, only one specific need was outlined enough to make substantive progress. Based on agency priorities, staff spent considerable time researching and compiling bull trout monitoring and research information for input into the CSMEP web application. In addition, staff developed comprehensive instructions for using the CSMEP application, which include the contents of all dropdown lists with definitions of terms used.

**Region** No major requests for data or maps from FWP projects were received during this fiscal year that are not reported under other sections of this annual report.

**WDFW** No requests for data or maps were received from regional planners or other FWP projects.

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Work Element: 161 Disseminate Raw & Summary Data

**Title: 4 Maintain and post Protected Areas data**

**Description:** StreamNet will a) maintain and provide access to the Council's Protected Areas dataset, b) archive the official version as a historic record, c) in consultation with the Council, respond to requests for information concerning Protected Areas, and d) modernize georeferencing and make these data available through online mapping. If the Council so directs, work with subbasin planners to record any desired changes to the protected status of individual streams.

**Deliverable:** The NPCC Protected Areas data are maintained and made available through the StreamNet online data query system and the online interactive map application.

**Project** Accomplishments During Fiscal Year 2006

**Region** The Protected Areas data were maintained and remained available through the StreamNet website. The interactive map application was maintained and associated metadata were published. Work to resolve location referencing issues was put off until a stable regional 1:24,000 scale routed hydrography is available and direction is received from the region. The original Protected Areas data set uses non-standard reach codes to indicate locations. These reach codes exist only on paper copies of the EPA River Reach Files that were "enhanced" by the Northwest Environmental Database (NED, a StreamNet precursor project) in the late 1980s. Many of the data in the Protected Areas data set can not be deciphered without these reports. A new scanner and software at PSMFC permits easily scanning large documents, so because these documents existed only in paper form, they were copied to .PDF format. These electronic files were backed up, eliminating the possibility that they could be lost. The documents were made available for download at <ftp://ftp.streamnet.org/pub/streamnet/RiverReachFiles>, and will be made available via the StreamNet Library's web site in the future.

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Work Element: 161 Disseminate Raw & Summary Data

**Title: 5 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 During Fiscal Year 2006

**CRITFC** The library continued to provide access to all library materials and services to the Columbia River basin research community, managers and the public. Our catalog was used by other libraries to verify the existence of documents for their patrons. In turn, we then provide documents through interlibrary borrowing and lending protocols. We also provided documents through on-demand digitization for those documents not restricted by copyright law.

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## Work Element: 118 Coordination

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Work Element: 118 Coordination

**Title: 1 Support Fish and Wildlife Program development activities**

**Description:** Participate in planning, development and/or coordination meetings with regional entities to provide advice in the area of data management, as requested, to support development of Fish and Wildlife Program projects and programs. Provide input on ways StreamNet can effectively contribute to the programs and general advice about data management. Participate in advisory groups, task forces, and other groups whose purpose is to enhance the effectiveness of the Fish and Wildlife Program relative to its data development activities.

**Deliverable:** StreamNet staff have participated in and supported a number of projects funded through the FWP, including PNAMP, NED and CSMEP.

Project Accomplishments During Fiscal Year 2006

**CRITFC** The librarian continued to provide support and information to the various regional data projects. The librarian developed a thesaurus and definitions for the NED portal, which are of use for navigation in the portal.

**IDFG** The Idaho StreamNet project leader attended a Northwest Environmental Data-Network (NED) meeting to learn about and discuss collaboration possibilities regarding the data portal being developed by NED.

**MFWP** We participated in conference calls and additional meetings in Portland with StreamNet SC staff and others interested in regional data management on: High Level Indicators, RME, MSRT in May to discuss data management projects and how they relate to the Council's RME paper, NED Data Management Summit in May and a Data Management Workshop in September hosted by CBFWA. Comments were submitted on the MSRT priorities to CBFWA and to the Council's Data Center proposal. Considerable time was spent on the 07-09 StreamNet proposal.

**ODFW** The Oregon StreamNet Project Leader participated in most regularly scheduled NED, PNAMP, and CSMEP meetings, contributing to shared discussions about data management-related activities, and future direction / funding options. Special meetings included the NED portal design workshop, the Regional Monitoring Partnership conference through the Nat. Resources Institute, and the CBFWA Data Priority meeting. Staff also attended the two-day 2006 Pacific Northwest Environmental Data Management Workshop in Portland, where we learned of and discussed the challenges of creating a region-wide information system.

Ongoing maintenance of the CSMEP web application continued until responsibility of the site was passed on to Regional StreamNet during the fourth quarter of the year. At that time, there were 1,521 records in the CSMEP web application. The Project Leader also participated in discussions of how to incorporate habitat efforts into CSMEP.

Oregon StreamNet staff reviewed for errors and omissions and provided feedback on the PNAMP Monitoring and Evaluation Survey online application.

Data management-related reviews were also done this year, including CBFWA's proposal titled, "StreamNet Derived Data Concept Paper", StreamNet's Data Flow Process whitepaper, and the Columbia River Data Center proposal. Oregon StreamNet also responded to BPA's survey on the use of their publications site, and correlated the StreamNet data categories that resulted from the Data Priority workshop with PNAMP monitoring indicators and CSMEP Performance Measures.

The Project Leader also coordinated with Stuart Toshach (NOAA-F Contractor), CSMEP, and Oregon Plan Monitoring Team representatives about a new inventory-type effort called the Salmon Status & Trends Data Mapping Project.



**Region** StreamNet continued its participation in regional efforts under the FWP to support improving data flow. The Program Manager served on the executive committees for the Northwest Environmental Data-network (NED) and the Pacific Northwest Aquatic Monitoring Partnership (PNAMP). In response to needs expressed through PNAMP for a regional inventory of monitoring activities, StreamNet developed a proposal to conduct a pilot inventory effort, received a small contract, and initiated the pilot effort. This included development of an online questionnaire for input, a database, and an interactive map application to display data, all of which were accomplished under the StreamNet contract. The small additional contract covered support for technicians to contact monitoring practitioners to obtain information. In addition, the project biologist participated in the Effectiveness Monitoring work group of PNAMP. StreamNet staff from our partner agencies also contributed to the NED and PNAMP efforts. StreamNet also continued support for the Collaborative Systemwide Monitoring and Evaluation Project (CSMEP). Maintenance of the CSMEP data inventory application was taken over by regional StreamNet at PSMFC due to a programmer vacancy in ODFW StreamNet. Feedback to NPCC staff was provided for the "high-level indicators" being developed.

The Program Manager developed a spreadsheet describing the various regional organizations and projects working on monitoring and data management to help alleviate confusion over how these groups relate to each other. The spreadsheet was disseminated through PNAMP and NED, and is available at [http://www.streamnet.org/about-sn/project\\_management.html](http://www.streamnet.org/about-sn/project_management.html).

During the second quarter, the Program Manager and the Regional Fisheries Biologist devoted substantial effort toward the PNAMP survey of monitoring efforts. They worked with other PNAMP participants interested in the survey to decide on the survey's purpose, and to develop the questions that would be asked. A proposal was written to fund seasonal technicians to contact people to take the survey. The proposal was submitted to BPA and funded. StreamNet personnel recruited, interviewed, and hired the seasonal technicians, designed and developed the on-line survey questionnaire, developed an on-line map-based data query output web site, and provided overall supervision and administration for this project.

The Regional Fisheries Biologist met with staff from the Oregon Watershed Enhancement Board to assist them in converting their restoration projects database structure to a structure similar to the StreamNet model. OWEB participated several years ago in an effort to update the StreamNet DEF for this data type, with the intention of sharing their data through StreamNet. This effort to convert their database will bring them a step closer to this goal.

**WDFW** The Vancouver Data Compiler loaded additional Methow/Okanogan fish dataset inventory information into the CSMEP web application. She also loaded nearly 250 records of detailed habitat dataset information into the Excel spreadsheet only because habitat data categories are not fully supported by the current version of the CSMEP Web application. The Project Manager requested that the CSMEP Project managers ask ODFW to update the Web application to add the capability to handle inventories for habitat datasets. During the year, responsibility for updating this Web application was transferred to PSMFC, and this requested work was postponed into FY-07. The Olympia data compiler developed an ACCESS database interface for CSMEP Table C-1 dataset inventories to facilitate the user interview process. By using this new tool, 91 dataset inventory records were compiled from eastern Washington biologists and provided to PSMFC-StreamNet for loading into the Web-based CSMEP repository. The Project Manager participated in several CSMEP teleconferences during the year to review FY-06 work expectations and discuss plans for the FY 2007-2009 proposal. He also worked with the WDFW CSMEP team to reform agency direction on the CSMEP Project for 2007-2009; a final draft of this direction was delivered to CSMEP Project Managers in December.

The Project Manager assisted staff on the JSAP Project (resident fish stock assessment above Grand Coulee Dam) with FY-06 work plan and budget elements for database work. He also participated in two meetings to lay out the three-year project vision for JSAP data collection, analysis, and dissemination. He directed a WDFW database developer to finalize changes to the 2005 WDFW JSAP data system and provided initial guidance to comprehending the complex Universal Database (UDB) structure.

In February, the Project Manager disseminated a draft PNAMP Aquatic Monitoring Inventory survey to key WDFW staff for their review and comment, then provided comments back to the originator. The Project Manager, along with other key WDFW staff, participated in the May 23-24 PNAMP/NED Workshop on Data Quality in Portland. The Project Manager assisted in recruiting, interviewing, and hiring a summer temporary worker to conduct PNAMP Aquatic Monitoring surveys in Washington state. He then provided local space and support for this worker, advised her on effective ways to contact WDFW staff for survey input, and answered questions as needed to help her make good progress.

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Work Element: 118 Coordination

**Title: 2 Support subbasin planning efforts**

**Description:** At the regional and cooperating agency levels, work with subbasin planners to provide needed information from the StreamNet database and to capture data developed as part of the subbasin planning process. We will work with the TOAST group to capture subbasin planning data from Oregon, and in FY-06 will work with others in an attempt to capture similar data in the other Columbia Basin states.

**Deliverable:** Data used in subbasin planning in Oregon are maintained and available through the StreamNet website, and progress is made toward identifying subbasin planning data from Washington, Idaho and Montana and decisions are made through NPCC on long term acquisition and storage.

Project Accomplishments During Fiscal Year 2006

**CRITFC** No work was done on subbasin planning with StreamNet funds in FY-06. Effort was expended in capturing data from the last round of planning on a separate contract.

**MFWP** No work was required on subbasin planning in FY-06.

**ODFW** No subbasin planning assistance was requested, so this time was redirected to supporting Recovery Planning efforts. Support continued throughout the year, including assisting recovery planning team members with their user accounts and discussing how to best get their information into the Recovery Planning Roadmap.

**Region** The Project Manager attended several NED workgroup meetings to discuss capturing the EDT and QHA data that were developed for the subbasin plans. CRITFC and NHI were contracted to obtain and organize these data, and the data were subsequently posted and made available for download on the StreamNet website using FTP.

CRITFC, under separate funding, has been collating the data, reports, and other information used for and generated during subbasin planning. StreamNet has an existing web page with links to archives of information which we had made available to the subbasin planners. Regional personnel worked with CRITFC to set up a system so that they could add to this archive the information they collected from the subbasin planners. FTP access was granted, the web page updated, and coordination between the Region and CRITFC allowed them to make available the resources they obtained.

**WDFW** No significant activities related to subbasin planning occurred during FY-06, so no action was needed.

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Work Element: 118 Coordination

**Title: 3 Coordinate with related activities outside of the FWP**

**Description:** Maintain communications between StreamNet and other applicable regional and state-level fish and wildlife activities and agencies beyond the Council's Fish and Wildlife Program to identify means for collaborative data collection, storage, and dissemination. On request or as possible, collaborative data activities will include tribal fishery programs within the Columbia Basin, federal land managers' fishery programs, state fish and wildlife agencies, and, with respect to water use and stream development, state water resource management and environmental quality agencies. Collaboration with coast-wide and private data collection/compilation efforts will be pursued when this supports overall project goals.

**Deliverable:** Coordination with fish and wildlife programs outside of the FWP is conducted as possible or needed

Project Accomplishments During Fiscal Year 2006

**CRITFC** Staff participated in data review workshops sponsored by Ecotrust and the Wild Salmon Center. Informal discussions were begun about how CRITFC can cooperate with those entities to improve data sharing and development in the future.

- IDFG** Idaho StreamNet has a very close working relationship with the rest of Idaho Fish and Game. We provided guidance and assistance for a number of activities, including data collection and database development projects. This collaboration helps StreamNet by building trust and creating more efficiencies in the flow of data to StreamNet.
- MFWP** The Fisheries Division Administrator and Montana CFWA representative provided feedback and support during the 07-09 solicitation and data management meetings. Coordination with the Fisheries Division included assisting in gathering information from biologists on the Fisheries Management Plan; conducting a native fish species survey; work planning involving desired data types, management plan, genetic reporting and tracking, and physical stream survey parameters; assisting with modifications to the division's electronic library; and creating a separate area on the FWP internal website for the division. Staff continued to be involved in Montana's Comprehensive Fish and Wildlife Conservation Strategy, including modifications to MFISH to monitor plan and identify focus areas.
- ODFW** Oregon StreamNet staff coordinated with State of the Salmon Inventory representatives, the Oregon Geographic Information Council Policy Advisory Committee, the Oregon Plan Monitoring Team, the Geospatial Enterprise Office GIS, Comprehensive Wildlife Conservation Strategy staff, ODFW's Technology Collaboration Team, and other Oregon state GIS staff to further our common aims for managing and sharing fish and wildlife information.

Staff members continued to Chair the ODFW GIS Coordination Group and participate in several Group and Subgroup meetings. The Project Leader presented the need for agency GIS collaboration and the goals of the Group to ODFW's Executive Leadership Team on Nov. 2nd. Our GIS Analyst developed a draft Charter for the Group to serve as a starting point for a discussion on how the group should be organized and what decision-making process the group will follow. The Group met once a month throughout the year, focusing on developing ODFW's GIS Strategy and Implementation Plans, developing training and software guidelines, and conducting a high-level GIS needs assessment.

Our GIS Analyst coordinated with a number of groups and efforts throughout the year, including attending Oregon GIS Project Leaders meetings, obtaining good insight regarding Strategic and Implementation Plan content, and learning about GIS applications in other agencies. In addition, he attended the Oregon Geographic Information Council joint Policy Advisory Committee / Framework Implementation Team meeting via conference call and the WebEx application (for online document sharing, polling and other features). The group discussed and then voted on recommendations regarding how OGIC should spend the \$500,000 allocation for data development in the FY05-07 biennium. He also coordinated with ODF to obtain 1m 2005 color orthoimagery for ODFW and StreamNet use, and obtained approval to sign onto the State of Oregon Orthoimagery Memorandum of Understanding that allows ODFW staff access to Oregon's half-meter orthoimagery data, and to contribute funding toward the purchase of the data. He attended the 7th OGIC Framework Standards Forum in Eugene, and 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 continued to coordinate Oregon's effort to develop a statewide barrier inventory database and restoration prioritization system. Work this year focused on crafting and shopping a funding proposal for this effort. Primary partners include ODFW, Benton County SWCD, and the OSU Institute of Natural Resources. A Barrier Prioritization Summit was held in September to share and discuss the merits of this effort. Other participants include OWEB, ODOT, ODF, WRD, BLM, USFS, NOAA, StreamNet, counties and watershed councils. We also scoped the requirements for the development of a Bioscience Framework theme, which is a data content mapping standard related to fish passage barriers. Efforts to obtain funding for the proposal continued throughout the year.

Oregon's Project Leader evaluated and commented on a NOAA-Fisheries Watershed Information Portal concept, reviewed a proposal for a new monitoring and evaluation project tracking effort, called "Data Management Design for Regional Project Tracking to Support M&E", by Steve Katz, et. al., and met with ODFW Invasive Species and Wildlife Integrity Coordinator to discuss possible ways we might help him manage and monitor invasive species distribution in Oregon.

**Region** NOAA Fisheries researchers used StreamNet data in a habitat restoration projects database, and PSMFC StreamNet staff responded to a request from NOAA-F to evaluate the accuracy of their conversion of StreamNet data into their data structure.

The Program Manager and regional Fish Biologist met with the CBFWA anadromous fish managers and discussed how StreamNet could assist in CBFWA's planned "State of the Resource" report for which data will be needed.

The Regional Fisheries Biologist continued work at a low level with the mussels work group. Discussions for how StreamNet could help this group disseminate data continued.

**WDFW** The Project Manager participated with other Washington resource management agencies in developing and forwarding a FY 2007-2009 proposal to the Fish and Wildlife Program for funding the integration of existing sets of Washington 1:24,000 scale stream linework into a single standardized layer. This layer could then be converted and loaded into the Regional Clearinghouse, as well as form the basis for a higher-resolution streams layer for use by StreamNet. The project proposal was not funded.

The Project Manager held a conference call for key WDFW data sources in the Walla Walla, Tucannon, and Asotin basins to initiate data compiling for key corporate data categories that have StreamNet relevance. These data sources agreed to meet with WDFW StreamNet data compilers in late June, to provide them access to detailed adult abundance data, and to assist with providing CSMEP dataset inventories for the lower Snake Basin. In return, StreamNet staff will convert and exchange their data for eventual StreamNet Online Web posting, to help them meet or exceed their current Fish and Wildlife Program project reporting requirements. The Project Manager followed up by responding in writing to a series of questions and concerns raised by Region 1 and Region 2 biologists. He also helped to coordinate data requests coming from CBFWA staff directed to east side biologists late in the year.

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## Work Element: 99 Outreach and Education

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Work Element: 99 Outreach and Education

### Title: 1 **Professional and public involvement**

**Description:** As needed, produce public information materials and 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, 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 During Fiscal Year 2006

**CRITFC** During FY-06, the library participated in a number of opportunities to market the project to other groups, such as at the Salmon Festival at Oxbow Park and the Salmon 2100 conference. Library brochures were distributed to interested parties at these meetings.

**IDFG** No professional or public materials relating to StreamNet were created or presented this year.

**MFWP** The Montana StreamNet Manager met with Montana Council members and staff to introduce herself and the StreamNet project. The MFISH web application has been redesigned and programming in ASP.NET is ~ 60% done.

**ODFW** The GIS Analyst prepared and delivered a presentation on the current and potential functionality of the ODFW IMS site to ODFW Wildlife Division managers. He presented a brown-bag seminar open to all staff on ODFW's internet mapping resources, including the data and tools available now and what may be available in the future. He also presented the efforts to date of the GIS Coordination Group to Information Systems Division. The Data Analyst spoke to a grade school about the salmon life cycle and StreamNet.

Oregon StreamNet sponsored a presentation on LIDAR technology and how it might benefit resource management efforts in the state. This is a growing source of information of tremendous use for wildlife habitat mapping and even potentially fish habitat mapping, including passage barriers.

**Region** The StreamNet Program Manager and several Steering Committee members participated in the annual meeting of the Organization of Fish and Wildlife Information Managers (OFWIM). Presentations on StreamNet data and capabilities were given, and project members gained significant information about new approaches to managing and disseminating fish and wildlife data. These efforts were accomplished on funding other than the StreamNet contract, with OFWIM paying the costs for the Program Manager, who was serving as OFWIM president.

Two editions of the StreamNet Newsletter were published during fiscal year 2006, available at <http://www.streamnet.org/Newsletter/Newsletters.html>. Newsletter #5 was sent out on November 4, 2005 to 1,039 email addresses. As usual, due to changes in email addresses or changes in jobs, a number of emails bounced back, resulting in 965 newsletters reaching their target. As of the end of the first quarter (12/31/05) there were 971 people signed up to receive future StreamNet Newsletters. Newsletter #6 was sent out on March 24, 2006 to 972 email addresses. The number is lower because of obsolete email addresses (resulting in bounced emails) that were removed after the previous newsletter.

The StreamNet brochure was updated to reflect current activities and update contact information. The brochure was distributed at various meetings, and is available on the StreamNet website home page.

**WDFW** The Project Manager created a PowerPoint slide on "WDFW Initiatives Supported by the StreamNet Project" and submitted to Regional Project Manager Bruce Schmidt for use in a presentation.

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## Work Element: 119 Manage and Administer Projects

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Work Element: 119 Manage and Administer Projects

**Title: 1** **Manage project activities**

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

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

**Project** Accomplishments During Fiscal Year 2006

**All** All project partners performed routine project management and administration functions. All provided project oversight through participation in quarterly StreamNet Steering Committee meetings; performed required supervision and oversight of staff within their respective programs at PSMFC and at the partner agencies; successfully managed and accounted for their respective budgets, including both the project as a whole at PSMFC and within each of the subcontracts; and contributed significant time and effort into development of five proposals for the FWP FY 07-09 project solicitation. The required accrual reports were prepared and submitted by PSMFC.

**MFWP** The organization of the StreamNet project within the infrastructure of MFWP was changed this year. The StreamNet staff is now part of the Information Management Bureau within the Information Services Division of FWP.

**ODFW** Oregon StreamNet was severely impacted by the loss of both programmers early in the second quarter of the year, and the loss of our Data Analyst during the fourth quarter. However, we filled other positions: our Library Tech position in April and a non-StreamNet GIS Tech/Cartographer position in January. Efforts to adjust the classification of the two long-term vacancies continued. It is hoped that a reclassification will improve our ability to recruit and retain qualified employees. A revised Statement of Work and budget were submitted to adjust to altered spending as a result of the prolonged staff vacancies and priority shifts.

The Project Leader also helped interview, hire and then supervise two data technicians for the PNAMP monitoring inventory project and CSMEP.

**Region** All project participants cooperated actively and extensively in developing project proposals for the 2007-2009 FWP Solicitation. A total of five proposals were submitted related to the StreamNet Project. The base StreamNet proposal addressed ongoing operations of the project and also included expanded emphasis on supporting the development and acquisition of StreamNet standard data sets from tribal programs in the Columbia Basin; expanded data content relating to migration barriers, water diversions and fish screens; and increased emphasis on developing automated approaches to speed data transfer from the data collecting agencies to the StreamNet database. In addition, four separate proposals were submitted to address acquisition, compilation, standardization and dissemination of data related to specific data types: hatchery releases by individual locations; comprehensive harvest data for sport and commercial in ocean and fresh water; development of conservation data including data for CSMEP; and comprehensive synthesis of habitat restoration project data. Ultimately, all proposals were consolidated and level-funded at the FY-06 amount.

In September a regional Data Management Workshop, hosted by CBFWA, was held to help guide and modify the StreamNet statement of work for FY 07-09. This meeting resulted in good participation and discussion, but provided less specific direction on data type priorities than we had hoped for. It did provide several concrete recommendations that we are pursuing. Reexamination and modification of the FY-07 statement of work was undertaken in response to this meeting, and that work was still ongoing as of the date of this report.

All project participants collaborated on developing guidance for the project. A strategic plan and project vision document was prepared, edited and published. In addition, project overview documents describing project functions and potential new directions were prepared for the MSRT during the proposal review process.

**WDFW** The Project Manager hosted a meeting in Olympia in December for six WDFW managers and the StreamNet Regional Project Manager. Current StreamNet work and strategic targeting of future efforts were discussed. For some it was their introduction to the StreamNet Project at WDFW; they found the discussion lively and relevant to current WDFW needs.

The Project Manager spent a considerable amount of time this year on writing Job Analysis, Positions Descriptions, and Performance and Development Plans for staff in compliance with new agency requirements for employee evaluation. The Project Manager also worked with Fish Program leads and WDFW Personnel to successfully promote the Data Manager to a level more accurately reflecting his agency and StreamNet responsibilities.

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## Work Element: 141 Produce Status Report

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Work Element: 141 Produce Status Report

**Title: 1 Quarterly reports**

**Description:** Produce quarterly performance reports on project activities and submit them to BPA within 15 days of the end of each quarter. Once PISCES is fully functional, submit quarterly status reports through PISCES.

**Deliverable:** Quarterly and status reports are submitted on schedule

Project Accomplishments During Fiscal Year 2006

**All** All project partners contributed to completion of quarterly Pisces Status Reports throughout the fiscal year, as required by BPA. In addition, we prepared and submitted detailed quarterly reports for the fourth quarter of FY-05 and the first quarter of FY-06. These reports followed our previous approach to reporting, which was to prepare detailed quarterly reports and a more general annual report in a shorter brochure format. However, due to the new requirements to submit quarterly Status Reports with very low level of detail to Pisces, and input from BPA, we changed our approach and dropped all further detailed quarterly reports. The detail formerly presented in those quarterly reports will now be provided in a detailed annual report, which will be presented at the Work Element Title level.

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## Work Element: 132 Produce Annual Report

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Work Element: 132 Produce Annual Report

**Title: 1 Annual report**

**Description:** Produce an annual report for FY-05 project activities within 30 days of the end of the fiscal year.

**Deliverable:** The annual report is submitted on time

Project Accomplishments During Fiscal Year 2006

**All** The Annual Report for accomplishments made in FY-05 was prepared and submitted in an abbreviated format and physically distributed as a brochure. All project partners participated in writing and editing the report. This report provided a summary of actions, while the details of specific actions were reported in detailed quarterly reports by individual milestones throughout FY-05. The text of the annual report is available on the StreamNet Reports and Publications page at [http://www.streamnet.org/about-sn/project\\_management.html](http://www.streamnet.org/about-sn/project_management.html). To request copies of the Annual Report brochure, contact StreamNet at [project@streamnet.org](mailto:project@streamnet.org) or (503) 595-3113. Due to input from BPA that abbreviated quarterly Status Reports in Pisces are mandatory, future annual reports will be written to include much greater detail at the Work Element Title level. Thus, future annual reports will serve the purpose of providing details of accomplishments that had previously been conveyed through the quarterly reports. This report for FY-06 is the first annual report using that detailed approach.

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## Supplemental Information

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### Work Outside the Statement Of Work

**Description:** Following are actions that were performed during FY-06 by StreamNet staff members but that were not specifically listed in the Statement of Work. These are either opportunistic actions that fit with the general goals of the project but just weren't anticipated in the SOW at the beginning of the year, or were actions performed by StreamNet staff members but on other funding. This last is possible because the StreamNet contract does not cover the entire year for many of our staff members and they must work part of the year on other projects. The actions reported here are directly relevant to StreamNet objectives or provide direct benefit to the project.

Project Accomplishments During Fiscal Year 2006.

**CRITFC** CRITFC staff previously supported on the StreamNet contract performed a number of functions in FY-06 that relate to StreamNet goals, but on other funding sources as a result of increased costs and level funding. Additions were made to the Subbasin Planning Data Archive as they were received from local sources. We are gradually converting this archive to a geodatabase format as time and other tasks allow. The archive includes all data staff could find that were organized on a spatial basis. Data sets were spatially referenced in a consistent manner.

CRITFC staff remained active in regional data issues. Staff participated with CBFWA to develop common databases and tools to manage fish population names and descriptions and salmon habitat.

A proposal was developed to incorporate data developed during the Hatchery Reform Project. Presently this process is disconnected from all regional data sharing discussions and is in danger of recreating all the problems encountered during the subbasin planning process.

**MFWP** Staff continued to be involved in Montana's Comprehensive Fish and Wildlife Conservation Strategy that has included modifications to MFISH to monitor, plan and identify focus areas.

**ODFW** The database application designed to track Restoration and Enhancement Program funding was completed and put into production. The application has an ArcIMS component that allows the user to produce map images related to their proposed application for funding. This application has been a great learning opportunity for future data compilation systems that will speed the flow of data to StreamNet.

Oregon StreamNet staff support of the Statewide Wildlife Conservation Strategy (Conservation Strategy) continued throughout the year, mainly focused on providing data development through GIS and analytical support. Development of the draft ArcIMS web application (called the COA Explorer, <http://nrimp.dfw.state.or.us/website/coaexplorer>) to support the needs of the Conservation Strategy was completed this year. The site provides access to the Strategy's Conservation Opportunity Areas (COAs), along with other relevant layers (e.g. habitat, vegetation). The development and potential uses of COAs for strategic conservation was presented to ODFW Wildlife Division staff, and has been accepted as a poster at upcoming American Fisheries Society and The Wildlife Society meetings. A poster presentation on the COA Explorer was given at the annual Wildlife Society meeting.

Assistance was provided to ODFW's Cougar Plan throughout the year by developing statistics outlining the percentage of different habitat types that are zoned rural residential to help identify areas where human-cougar interactions could most likely occur. We also provided a series of cougar maps for an ODFW Commission Meeting showing cougar complaints overlaid with cougar mortality data. Staff also developed a series of maps showing habitat, vegetation, and wildlife management units to aid in plan development, and created PDFs of the final management plan. Other Wildlife Division support included developing statewide vegetation and wildlife habitat data layers, and writing these to the wildlife geodatabase for greater agency access, creating and editing angling and game bird regulations maps, controlled hunt unit and travel management area maps.



We completed the web form of the Roadless Area Petition web application to allow users to submit comments on the Governor's roadless area petition. The application was transferred to the NRIMP web server and linked to from the Governor's website. We also completed the admin component of the Roadless area comments application that enables the administrators from the governor's office to view comments as well as summary statistics. The comments and statistics can be filtered by date range. The statistics are in chart form, where the bar graphs and pie charts update depending on the date range selected. There were a total of 799 comments submitted.

One NRIMP staff member (who is not funded by StreamNet) completed online training to start learning ASP.NET development, including the use of Visual Studio software and the C# programming language. This knowledge will be used to facilitate database access from ODFW ArcIMS sites, which will benefit the Comprehensive Wildlife Conservation Strategy and Oregon StreamNet-maintained sites.

NRIMP staff provided a great deal of support to the Technical Recovery Team's West Coast Salmon Recovery Planning effort. We enhanced an existing Recovery Planning spreadsheet application so planners can maintain, track, and share pertinent information, built a Recovery Planning Data Library to house existing and expected datasets, and linked the two together to allow planners to control versioning. The system also notifies specific individuals/groups when specific action occurs (e.g. uploading of new data, a new user is added to the system, data are finalized, etc.) We also drafted a System Procedures Manual/User Guide for those involved. Our Data Analyst kept the information in the system updated, assisting recovery planning team members with their user accounts and discussing how to best get their information into the system, coordinated with Plan contributors to ensure they complied with established deadlines and content requirements, and posting documents for some contributors (which involves taking their document and breaking it into Plan section pieces, creating a metadata record in the Data Library for each piece, and posting the pieces).

The Project Leader presented three individual data and database management support proposals to the Oregon Plan Monitoring Team (OPMT): distribution updates; IMS site development for Oregon Plan datasets; and designing data standards /database templates for watershed councils, and compiling watershed council data.

Staff continued to support the Oregon Plan Review (Metadata Warehouse) site and provide technical support to numerous users of the site. Data compilation of Oregon Watershed Council datasets continued at a lower level in support of the Oregon Plan Assessment this fiscal year. This included posting statewide documents to the NRIMP Data Clearinghouse website, and creating a metadata record for each.

A vintage plotter was acquired and configured to the network at no cost to the project which will be used to address map printing needs of other ODFW programs.

**Region** The Regional GIS Specialist partnered with NOAA Fisheries on a project to build an interactive map application making available data developed as a part of the recently published Pacific Coast Groundfish Essential Fish Habitat EIS. The program website and map application will continue to evolve and are currently available at <http://marinehabitat.psmfc.org>.

Under NOAA-Fisheries funding, the Regional Fisheries Biologist supervised two field technicians hired to evaluate how well a habitat restoration projects database compiled by NOAA-Fisheries describes what is actually observed in the field. The goals of this work included determining the quality of data capture for such projects, estimating the completeness of the database, and estimating the density of completed projects on the ground.

The Regional Data Manager worked with compilers at CDFG to update dam and barrier data with associated reference information, find and remove duplicate barriers, and load habitat restoration data from California into the StreamNet database.

The Region, while examining files stored on servers, happened upon the 1998 IHOT summary reports which describe hatchery operations in the Columbia Basin. These files were cleaned up (duplicate files deleted, file names improved, etc.), and the files were sent to the StreamNet Library for inclusion in the Library's electronic collection.

**WDFW** The Project Manager organized contacts and sent out surveys of monitoring databases and resource monitoring programs for the Governor's Forum on Monitoring and the state Office of Financial Management in response to a Legislative directive implemented by IAC's Executive Director Bruce Crawford. He completed compilation, editing, and fiscal impact figures for surveys to help build the final report, which was presented to the Forum in July.

The Senior GIS Analyst was sent to two days of NHD-in-GEO training to prepare for assisting in Washington hydrography edits for the Pacific Northwest high-resolution NHD line layer. Future StreamNet hydrography data will be derived from NHD-managed linework, as this is the only consistent source for interstate streams data.

WDFW staff began building a Web application to collect stock-based escapement estimate information from field biologists located across the state in the first test of using "data funnel" applications to populate corporate data repositories residing at Headquarters in Olympia. These "Annual Data" form the core information for our Salmonid Stock Inventory (SaSI) database. The application was deployed across the state for initial testing, which was successful. The application is the first login-controlled Web application for the Fish Program, and features auto-generated e-mail notifications to specified user lists when estimates have been posted, have been updated, or are past due. Final rollout of the application and initial data entry began in August.

In February, the Project Manager appealed to the Pacific Salmon Commission's Data Sharing Committee to allow release agencies the option of reporting annual fish releases in "unrolled" format, instead of rolled up into single records for each CWT group. The Committee refused to authorize the option, so currently the Regional Mark Information System cannot accept "unrolled" releases, even on an experimental basis. Then the Project Manager attended the Coastwide Annual Mark Meeting in May in Port Angeles to give a presentation to regional marking and tagging managers on the option of reporting annual fish releases in "unrolled" format, instead of rolled up into single records for each CWT group. Mark Committee members had mixed reactions to this proposal, and agreed to forward their agency positions to the Mark Committee chair for inclusion in the official meeting minutes. Inability of the Pacific Salmon Commission's Data Sharing Committee and the Coastwide Mark Committee to resolve this issue paves the way for a future StreamNet solution to address users' needs

All WDFW StreamNet staff attended the WDFW Fish Program Science Division Annual Workshop in September. The Data Manager and the Vancouver Data Compiler developed a poster for this meeting describing the StreamNet project and showcasing typical data requests and services provided. GIS staff also provided samples of their custom map services, using key background layers maintained by staff funded in part by StreamNet.

The Project Manager completed final fish distribution and use data modifications for Washington Department of Ecology in preparation for the public review phase of the 2003 Statewide Water Quality Rules adoption process. All maps and related text descriptions for WRIAs 24-62 (the Columbia Basin) were reviewed and checked for accuracy. He also agreed to serve on a public review process team and attended six public meetings held across the state during August to respond to questions about fish use. Finally, he responded in writing to a series of public comments received regarding the basis for "documented" fish use in specific waters.

The Project Manager contributed significant edits to the final draft of the Data Management chapter in an upcoming AFS Publication on establishing standardized Fish Field Collection Protocols.

The Project Manager led other WDFW staff in designing and starting to populate stock-based datasets covering juvenile migrants, harvest, and returns as part of WDFW's new Managing For Success initiative. Establishing and actively maintaining population-based datasets are key parts of Washington's salmon recovery activities and may align well with the direction StreamNet is asked to take in FY-07.

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