# - FY 1996 Annual Report -

U.S. Department of Energy
  Bonneville Power Administration
  Division of Fish and Wildlife
Columbia River Inter-Tribal Fish Commission
Idaho Department of Fish and Game
Montana Fish, Wildlife, and Parks
National Marine Fisheries Service
Northwest Power Planning Council
Oregon Department of Fish and Wildlife
Pacific States Marine Fisheries Commission
Shoshone-Bannock Tribes
U.S. Fish and Wildlife Service
Washington Department of Fish and Wildlife

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# FY 1996 Annual Report: StreamNet

Period Covered:
October 1, 1995 - September 30, 1996

Prepared by:

Stan T. Allen
Pacific States Marine Fisheries Commission

Drew O. Parkin
Pacific States Marine Fisheries Commission

Dick O'Connor
Washington Department of Fish and Wildlife

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# Executive Summary

Fiscal Year 1996 was a year of significant activity and accomplishment for the StreamNet project. Prior to 1996 the Coordinated Information System (CIS) and Northwest Environmental Database (NED) were separate projects. CIS focused on data related to anadromous fish, while NED focused on resident fish, wildlife, and other environmental factors. In 1996 these projects were merged and given the name StreamNet to reflect the project's focus on data related to aquatic resources. Today StreamNet serves as a principal means for the compilation and distribution of data related to the region's Fish and Wildlife Program.

StreamNet is a component of the Fish and Wildlife Program of the Northwest Power Planning Council. The project's objective is to promote exchange and dissemination of information in a standardized electronic format throughout the Columbia River Basin. This project is increasingly being viewed as a principal means for compilation and distribution of data related to the Fish and Wildlife Program. The project is funded by the Bonneville Power Administration (BPA), U.S. Department of Energy, as part of BPA's program to protect, mitigate, and enhance fish and wildlife affected by the development and operation of hydroelectric facilities on the Columbia River and its tributaries. StreamNet is administered by the Pacific States Marine Fisheries Commission with active participation by tribal, state, and federal fish and wildlife agencies.

This report constitutes the final report of the StreamNet project for fiscal year 1996.

Written products prepared in FY 1996 include:

1. StreamNet Exchange Format Documentation report
2. Regional Fish and Hydrography Information: Data Needs, Standards, and Proposal for Implementation (co-author)
3. draft DS Documentation (in electronic format)
4. DS users manual (in electronic format)
5. Library Access Guide for the StreamNet/CRITFC Library
6. Draft Technical Applications Development Strategy and Implementation Plan to Provide Platform Independent Access to StreamNet Data Products Through The World Wide Web (WWW) Service of the Internet
7. StreamNet: Report on the Status of Salmon and Steelhead in the Columbia River Basin - 1995
8. Quarterly Reports (Oct-Dec 1995, Jan-March 1996, April - June 1996)
9. StreamNet FY 1996 Annual Report
10. FY 1997 Statement of Work and Budget
11. Spawner Recruitment Relationships for Spring and Summer Chinook Spawner Recruitment Relationships for Spring and Summer Chinook (co-author)
12. Protocol for Consolidation of the Northwest Environmental Database and the Coordinated Information System

13. draft StreamNet Data Plan
14. draft StreamNet Strategic Plan and support documents
15. Future Directions for Anadromous and Resident Fish Data Development
16. Methodology used to produce an encoded 1:100,000-scale digital hydrographic data layer for the Pacific Northwest
17. Strategy for Using Dynamic Segmentation with the EPA River Reach File

Products related to data development and delivery include:

1. a new release of the Distributed System, which included updates of data from previous releases, new data types, references, and expanded data retrieval capabilities
2. an initial version of a StreamNet web site (with BPA)
3. an enhanced version of the home page including a live query capability
4. 900+ publications and reprints cataloged into the StreamNet library

In addition, project participants handled 1702 data and information requests during the fiscal year.

# Objective 1.   Data Compilation

Compilation of data related to fish and other aquatic resources is the primary objective of the StreamNet project.  Data reports, web sites and presentations are of little value to our user community if these products are not supported by  high quality, up to date information. In 1996 significant progress was made in both  increasing the data content of StreamNet and solidifying exchange formats and data exchange processes.  These accomplishments were evident at both the State and Regional levels.  Over 90,000 records were edited and/or added to the StreamNet system in FY 1996.  Details concerning the content of specific datasets are available from the StreamNet Regional Data Manager at PSMFC.   A fundamental building block for an interagency data system of this type is the design and implementation of data exchange standards to ensure compatibility of data delivered by various parties.   All of the data compiled by this project conforms to these standards.  For FY 1996 the project addressed seven distinct data compilation tasks. Accomplishments relating  to each task are summarized below.

## Task 1.1  Design, develop, maintain standard codes/formats for data set exchange.

Providing leadership in aquatic data exchange standards  is an essential ongoing task for this project. Significant progress was made in FY 1996 in both designing data exchange standards and obtaining agreement by resource agencies to use these standards. Data set exchange standards for the StreamNet project are documented in a report titled "StreamNet Exchange Format Documentation." An updated version of this report was prepared during 1996. Addenda were also are issued as advisories to alert project data providers to new or modified guidelines.

## Task 1.2  Compile, manage, update, maintain and document standardized data and begin collection of anadromous fish data outside the Columbia River Basin.  All data shall be cross-referenced to the EPA Reach System.

This is the primary task under which anadromous fish data are compiled and exchanged in standardized form.  The task includes several sub-tasks related to specific types of anadromous fish data enhanced and updated During 1996 all of these anadromous datasets were updated.  A significant enhancement was the addition of trends for areas in Coastal Oregon and Washington and Puget Sound.

Notable accomplishments included the following:

- Oregon and Washington in developing an historic sport harvest dataset for Columbia River tributaries that extends back into the 1960's,
- IDFG prepared ten years of extensive juvenile abundance data for exchange.

- PSMFC StreamNet staff developed procedures to transfer extensive hatchery release and CWT datasets from other PSMFC projects to the StreamNet database.
- A new spawner-recruit dataset for spring chinook was developed and incorporated in cooperation with the PATH Project.
- Hatchery facilities data were reviewed and updated for all states.

Tables 1 and 2 summarizes StreamNet data holdings as of the end of the 1996 contract period.


### *Task 1.3  Document data to StreamNet Library with corresponding "short" reference and physical documents used.*

All data included in the StreamNet system are referenced to source materials.  As data is forwarded to the Regional Data Manager for inclusion in the StreamNet database, hard copies of reference material pertinent to the data submission are simultaneously forwarded to the StreamNet library where they are incorporated into the StreamNet reference system.  This procedure ensures electronic referencing of all data in the StreamNet database and linkage of fully cataloged bibliographic citations to nearly all numeric values in the database.  This system requires a significant amount of effort on the part of data compilers but insures that all information in the system is fully referenced.    Some data providers have also included references for spatial datasets such as anadromous fish distribution, Both ODFW and CRITFC have taken substantial extra steps to locate and provide other reference materials to augment the growing StreamNet collection.  The electronic referencing system was up to date as of the end of the 1996 contract period.

# Table 1. Anadromous Fish Data Contents for Version 96.1 of StreamNet On-line.

| | Adult Abundance Data | | | | | | Juvenile Abund. |
|---|---|---|---|---|---|---|---|
| | Mainstem Dam Counts | Weir / Dam Counts | Redd Counts | Peak Spawn. Counts | Est. of Spawn. Pop. | Spawn - Recruit Est. | |
| Idaho | 60-95 | NS | 57-95$^D$ 87-95$^B$ | NS | NS | 57-89$^{A,D}$ | NS |
| Oregon in Col. Basin | 60-95 | 50-94 | 65-94 | 50-94$^{D,L}$ | 70-94$^A$ | 52-89$^{A,D}$ | NS |
| Washington in Col. Basin | 60-95 | NS | NS | 64-93$^D$ 45-93$^I$ | NS | 70-89$^{A,D}$ | NS |
| Oregon Coast | NA | 50-94 | NS | 50-94$^{D,L}$ | 70-94$^A$ | NS | NS |
| Washington Coast | NA | 71-91$^{A,F}$ 71-92$^{A,B}$ | NS | 52-91$^F$ NS$^B$ | 67-92$^F$ 78-92$^B$ | NS | NS |
| Puget Sound | NA | 26-91$^{A,F}$ 29-92$^{A,B}$ | 66-92$^{A,F}$ 84-92$^{A,B}$ | 51-92$^F$ 90-92$^{A,B}$ | 53-92$^F$ 78-92$^B$ | NS | NS |
| California | NA | 25-83$^{A,C}$ | NS | 70-93$^C$ | 40-83$^{A,D}$ | NS | NS |
| Alaska | NA | 82-94$^B$ | NS | 73-92$^B$ | 78-92$^{A,B}$ | NS | NS |

| | Hatchery Data | | Harvest Data | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Returns | Releases | FW Sport | FW Comm. | FW Treaty | Marine Sport | Marine Comm. | Marine Treaty |
| Idaho | 69-94$^A$ | 75-94 | 54-95 | NA | NS | NA | NA | NA |
| Oregon in Col. Basin | 45-94$^A$ | 75-95$^G$ | 69-94 | NA | NS | NA | NA | NA |
| Washington in Col. Basin | 50-94$^{A,D,L}$ 57-94$^{A,B}$ | 75-95$^H$ | 80-92$^{K,L}$ 80-94$^J$ 62-94$^B$ | NA | NS | NA | NA | NA |
| Columbia River | NA | NA | 62-94$^B$ 80-94$^{F,M}$ | NS | NS | NA | NA | NA |
| Oregon Coast | 62-94$^{A,F}$ 83-93$^{A,B}$ | 75-95$^G$ | 69-94 | NA | NA | 74-94$^{D,L}$ | NS | NS |
| Washington Coast | 61-91$^{A,F}$ NS$^B$ | 75-95$^H$ | 62-94$^B$ NS$^F$ | NA | NA | 50-92$^F$ 62-94$^B$ | 72-92$^F$ | 50-92$^F$ |
| Puget Sound | 38-91$^{A,F}$ NS$^B$ | 75-95$^H$ | 62-94$^B$ NS$^F$ | NA | NA | NS$^F$ 62-94$^B$ | NS | NS |
| California | NS | S | NS | NA | NS | 62-90$^{D,L}$ | 52-90$^{D,L}$ | NA |
| Alaska | NS | NS | 77-94 | NA | NA | 77-94 | NS | NA |

A = Incomplete, some areas, species, or years may be missing
B = Steelhead
C = Summer Steelhead
D = Chinook
E = Some steelhead counts through 1993
F = Salmon species
G = Does not include untagged, unassociated releases prior to 1982
H = Does not include untagged, unassociated releases of steelhead

I = Chum
J = Spring Chinook
K = Fall Chinook
L = Coho
M = Includes Buoy 10 Fishery
NA = Not applicable
NS = Not submitted or collected at this time, could appear in later release

**Table 2.  Non-Fisheries Data Contents for Version 96.1 of StreamNet On-line.**

*Shaded columns indicate data that are not currently available in the Distributed System, but can be obtained through requests to the Regional Data Manager at PSMFC*

| | Dams Facilities | Hatchery Facilities | Reference Library | Tributary Flow Data | Mainstem Dam Flow Data | Nearshore Ocean Upwelling Indices | Sea Surface Temp and Pressure |
|---|---|---|---|---|---|---|---|
| Idaho | C | Ca | C7 | C5 | C3[*] | | |
| Oregon In Col Basin | C | Ca | C7 | C5 | C3[*] | | |
| Washington In Col Basin | C | Ca | C7 | C5 | C3[*] | | |
| Oregon Outside Basin | C | P | C7 | C5 | NA | C6 | C2 |
| Washington Outside Basin | C | P | C7 | C5 | NA | C6 | C2 |

C = Complete for hydropower and dams 10ft and over in size
Ca = Complete for anadromous fish production facilities
C2 = Complete temperature, pressure, and wind speed from 1854 - 1992, entire Pacific Ocean
C5 = Complete through 1995 for most USGS gauging stations, data available from Regional Data Manager
C3[*] = Daily Flow and spill data by project from 1960-1993
C6 = Monthly Mean data for 11 west coast stations from 1946-1995
C7 = StreamNet References Complete as of 4/96
NA = Not Applicable
P = Partially Complete (Not all years or all streams have complete data at this time)

## Task 1.4  Prepare 100K base maps, compile and encode data on anadromous and resident fish distribution and related factors.

During 1996 all four states were actively engaged in updating species distribution data at the 100K-scale.

ODFW concentrated on entering and verifying spawning and rearing information and barriers to fish migration.  At the conclusion of the 1996 contract ODFW had prepared statewide 100K-scale coverages of spawning and rearing locations for coho, fall chinook, spring chinook, chum, winter steelhead, summer steelhead.  Partial coverages were available for brown and rainbow trout and for coastal cutthroat trout.  A partial statewide 100K-scale fish barriers dataset was also prepared.  ODFW also identified administrative stream management designations at the 100K scale including American Fisheries Society (AFS) aquatic diversity areas, FEMAT Tier 1 areas, OR Division of state lands essential salmon habitat designations, and ODFW salmon core production area designations. ODFW also cooperated with  Oregon State University (OSU) and Oregon AFS in tagging OSU museum fish collection records to the 100K reach system.

IDFG  and WDFW focused on the transfer of existing fish distribution data onto the 100K-scale hydrology layer and began to compile statewide updates for anadromous species.

MFWP completed electronic coverages for all native salmonids in Montana as well as for select non-native salmonids and native, non-salmonid sensitive species. Montana also prepared statewide distribution maps for several big game wildlife species.

### *Task 1.5  Begin development of a comprehensive aquatic habitat database*

Participants recognize that region-wide compilation of habitat data is not currently possible. What is possible is the development of a foundation for future data development. It is also possible to capture such habitat data as is currently available. Significant accomplishments regarding habitat data included:

- StreamNet staff actively participated in the IRICC process to agree on a core set of habitat data variables and procedures for collecting and sharing in the future. The StreamNet project manager served as co-chair to IRICC Fish/Hydro Strike Team and co-authored **Regional Fish and Hydrography Information:  Data Needs, Standards, and Proposal for Implementation**.  This document establishes core data and exchange standards that will guide future agency data collection and compilation efforts.  Some agencies have already incorporated the IRICC agreements into their current habitat data sampling procedures, while others are evaluating ways to transfer state habitat data into exchange formats that facilitate merging their data with other regional sets. We expect accelerated progress in this area during 1997.
- ODFW worked with the  USFS and BLM  to merge certain historical collections of habitat data together to demonstrate the potential of multiple agency habitat datasets.
- StreamNet staff initiated discussions with the US Forest Service regarding making available data collected through the Eastside EIS and  similar efforts for streams on the west side of the Cascade Range.  Datasets from the eastside project were secured during 1996.

### *Task 1.6  Maintain and enhance the 1:100,000 river reach tabular and graphic files.*

During FY 1996 IDFG, MFWP, ODFW, and WDFW, all built systems based on dynamic segmentation to create 1:100,000 resolution stream routing systems based on stream names in their states.  ODFW and WDFW completed the stream naming and verification procedures for all reaches in Oregon and Washington.  IDFG built a prototype for use in the Upper Salmon River basin. IDFG will complete this process statewide in FY 1997.  MDFWP created a routing system for western Montana in conjunction with an update of bull trout distribution data.

### *Task 1.7  Develop data exchange procedures with Columbia Basin tribal fishery programs.*

CRITFC staff took the lead in identifying tribal fishery data sources in order to assess these collections in the light of gaps in StreamNet data coverages for the Basin. An extensive series of

historical datasets collected by Yakama tribal staff was located and conversion to StreamNet exchange formats begun. Tribal biologists in several river basins in the region were recruited to review and extend the anadromous fish presence, use, and blockage information in rivers where they have expertise. Additional work in developing regular data sharing procedures with tribal fishery programs will occur in FY 1997.

# Objective 2.  Library/Reference Services

The StreamNet Library performs several functions, including creating and maintaining a collection of reference documents related to StreamNet datasets, maintaining the physical collection, and performing research support tasks. In FY 1996, the library collection continued to grow, and the number of users served by library more than doubled. The FY 1996 work statement included five specific library tasks.  Accomplishments related to each task are highlighted below.

## Task 2.1   Material acquisition for StreamNet

As a part of the data compilation and standardization efforts described in Objective 1, each StreamNet data item is referenced as to its source.  A hardcopy version of each source document is sent to the StreamNet Library for cataloging and shelving.  The StreamNet Library received and cataloged 32 reference documents in FY 1996.  All catalogued materials are made part of the StreamNet library and are available for use by the public.

Another task during FY 1996 was to continue to acquire and catalog reports prepared through Fish and Wildlife Program projects funded by the Bonneville Power Administration (BPA).  Over 100 historical documents were acquired.  A process was also established for receiving new reports.  This involves weekly requests of the BPA Public Information Office.  During FY 1996 all Fish and Wildlife Program reports were fully cataloged and made available to users via the StreamNet Library Reference System.

Library staff continued to improve the organization of the CRITFC/StreamNet Library especially the Alaska, Washington, Oregon, California and International sections. Staff also consulted with PORTALS and other academic entities about the potential for placing a catalog on one of their servers.

The library continued to collect appropriate materials from other sources as these became available.  Included was the acquisition of documents from the collection of the late L. Everson, who, during his career, had significant involvement with Columbia Basin fish and wildlife issues.

During FY 1996, the librarian initiated discussions with the Northwest Power Planning Council concerning the potential to merge these collections.  A preliminary agreement was reached concerning this.

Library staff continued to improve the physical durability of StreamNet documents by binding with covers the many documents that were sent as unbound photocopies.

The librarian also worked to identify space to relocate the collection and, once space was identified, to conduct such planning as was required to expedite a move in FY 1997.

*Task 2.2   Continually update, maintain, and provide an electronic bibliography of references pertinent to fish and wildlife issues in the region.*

In FY 1996 we initiated development of an electronic bibliography of references applicable to regional fish and wildlife issues. Our ultimate goal is to build a bibliography that can be searched on-line via the StreamNet web site.  Initial tests conducted during 1996 showed promising results.  As a part of that effort, ODFW staff developed a complete database/catalog of technical reports published by the Oregon Fish Commission, Game Commission, and Department of Fish and Wildlife during the last 50 years (4,832 records).  This information was subsequently incorporated into the StreamNet system. An effort is also underway to provide all of these documents to the StreamNet Library in order to make them available to users.

*Task 2.3  Catalog references for StreamNet.*

A total of 440 documents, including 155 BPA and 32 StreamNet dataset source documents, were cataloged into the References database this year. In addition, over 500 reprints were cataloged using Papyrus software.  All documents were subsequently added to the library collection.

Library staff actively participated in the IAMSLIC duplicate exchange program.  We received 167 journal issues and approximately 74 technical reports through this program.

To keep track of our growing collection of circulating materials we conducted a semi-annual circulation inventory.

*Task 2.4   Develop and provide library services for the StreamNet user community, as described in the StreamNet Library Users Manual.*

During FY 1996 we handled 139 interlibrary loan and 125 reference requests and circulated over 200 copies of materials. The number of users served who are not StreamNet project members has increased significantly, indicating the extent to which "word-of-mouth" coupled with our own efforts to publicize our services has succeeded. The StreamNet Library is now considered a primary source for both print and electronic information about the region's fish resources.

Two of the major issues addressed during FY 1996 were user fees and the lack of adequate space for the library collection and services. Discussions concerning  user fees were held with the steering committee and a formal schedule prepared and distributed as part of a document titled "Library Access Guide for the StreamNet/CRITFC Library." The space issue was addressed by taking steps to acquire a larger space on a different floor in the building housing the current library.

***Task 2.5  Maintain standard keyword list for all StreamNet products***

Discussions among library staff, the regional data manager, and state data managers resulted in a strategy for developing a  standard keyword list.  Such a system would increase the likelihood of the user finding the specific materials or data of interest through any StreamNet service by choosing keywords from a standardized list.  The variety of sources from which we receive data and references makes such standardization a challenge.  Efforts to create the keyword list  were initiated and will continue into FY 1997.

# Objective 3.  Information Services

Objective 1 addresses the development of data for the StreamNet database.  Objective 3 complements this by providing data maintenance and delivery of these data to users.   Data maintenance functions include administering the StreamNet database, expanding the structures and capabilities of the database, and porting data between computer platforms.  Also included are the various data delivery activities.  Often this involves responding to individual requests for data in a variety of formats.  Increasingly, it also involves providing data in electronic formats that can be accessed by users via computer.  StreamNet and its predecessor projects have historically delivered electronic data through a Distributed System (DS) and through file transfer capabilities of bulletin board systems.  While these means continued to be used in FY 1996, the project also embarked on an ambitious effort to provide data via the World Wide Web service of the Internet.  For FY 1996 the project addressed nine distinct information services tasks.  Accomplishments relating  to each task are summarized below.

## *Task 3.1  Receive and respond to requests for data/information.*

During FY 1996 there was a significant increase in the number of data and information requests received and responded to at both the regional and state levels.  A total of 1,702 data/information requests were responded to during the year, compared to just over 900 requests in FY 1995 .  Data/information requests were reported throughout the year via quarterly progress reports.  Requests varied widely from general information requests to specific requests for maps and data in custom formats.  The number of requests handled by participating organizations was as follows:

|                | number of requests |
| -------------- | ------------------ |
| CRITFC/Library | 484                |
| IDFG           | 67                 |
| MDFWP          | 313                |
| ODFW           | 161                |
| PSMFC          | 176                |
| WDFW           | 501                |
|                |                    |
| Total Requests | 1,702              |

## *Task 3.2  Continue to operate a Bulletin Board System for use by project participants/customers.*

The StreamNet bulletin board service (BBS) was managed and maintained throughout FY 1996.  Use of the BBS continued to decline as StreamNet customers converted to use of electronic mail, ftp sites, and the World Wide Web for communications.  After assessment of this declining use, the StreamNet BBS was disabled on November 22, 1996 and will no longer be maintained.

***Task 3.3  Administer the StreamNet datasets.***

In FY 1996 we ported StreamNet datasets to Ingres for use with the new StreamNet web site. Draft documentation of the StreamNet database has been prepared and is available at the web site. In addition, the Distributed System Help function was enhanced to provide such internal documentation.

***Task 3.4  Refine and enhance StreamNet database structures and capabilities.***

StreamNet database design, implementation, and enhancement activities were carried out throughout FY 1996.  Additional table, report, and data exchange formats where designed and implemented as needed.  This work will continue FY 97 as the final hardware and software platforms are chosen and implemented for the StreamNet data system.

***Task 3.5  Develop and maintain appropriate data access systems.***

In FY 1996 the second major release of the DS was made public.  This release was the first to use the name *StreamNet;* the prior release was under the name of *Coordinated Information System.* Modifications to the previous version began in January and were completed for beta testing by April.  During April and May Beta testing was conducted, technical problems were resolved, and modifications were made to the on-line help documentation.  The product was subsequently approved and released in June (Release: 6.96a).
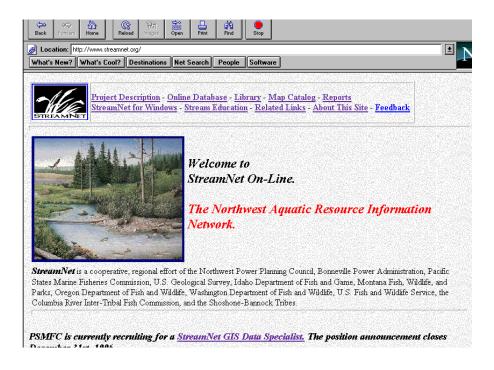
FY 1996 also brought the first public release of the StreamNet web site. The initial release contained mostly static pages and a prototype of how a on-line query system would work (using static pages).  A major revision followed which enhanced most features and added a prototype map catalog.  This task was accomplished with staff assistance from BPA.

A substantial amount of work was put into planning a strategy for moving data and data access to the World Wide Web in 1996.  In July this work culminated with the release of the *Draft Technical Applications Development Strategy and Implementation Plan to Provide Platform Independent Access to StreamNet Data Products Through The World Wide Web (WWW) Service of the Internet.*  This document provided guidance for development of  mechanisms for providing spatial and tabular data to users via the Internet.  In July work began on implementing a live query capability for the web site.  This involved a substantial level of programming and database effort and was completed by late summer.  A prototype of the system was completed in September and officially released in October. Since then, minor revisions have been made to fix bugs and add enhancements. The live query may be viewed at the StreamNet web site (www.streamnet.org) by hitting the "on-line database' button.

Reviews of the on-line query system by participating agencies have been positive.  This product constitutes one of the few efforts to actually provide users with the ability to query data via the Internet and should be viewed as a major success.

There are several web site issues that will be addressed in FY 1997, including the handling of on-line spatial data requests and dealing with response time and large data request considerations. For many users, it appears that Web access to our products is convenient, adequately responsive, and preferable to other methods of delivery.

The StreamNet home page is shown below.



## Task 3.6  Provide data infrastructure, services, and documentation for data input and conversion to data exchange formats.

Ongoing programming support and data services were provided by Regional staff to all of our data cooperators in 1996.

## Task 3.7  Prepare documentation of data delivery system(s).

The on-line users manual was updated for the June release of the DS.  The users manual was not made available in print form.  Rather, a quick start document was produced and distributed with the installation diskettes.


## Task 3.8  Test and distribute the information access system(s).

Both the DS and the web site were tested for 2-3 months each prior to distribution.  These tests helped us to discover and fix problems with both the user interface application and the data.

As described in task 3.5, the DS was release in June after about three months of testing.  The web site on-line query system was made available in October after about two months of testing.

Project management maintains a log of DS bugs.    This log is distributed with the DS in a read me file and is also available through the StreamNet web site.  Users can also log problems through the web site.  There is no log of problems with the web site since they are fixed as discovered. (This is one of the principal advantages of the web as a means to distribute data.)


## Task 3.9  Provide training to StreamNet end users.

Training on both the DS and the web site mainly took the form of individual instruction on an "as requested" basis.  Formal training on the DS version was not scheduled due to the emphasis on the web site as a means to distribute data.  Care has been taken to build instructions into the StreamNet home page such that the user can learn by doing.  The in-house test period that precedes release of major enhancements provides an important opportunity to identify areas where instructions may be lacking or need clarification.

# Objective 4.  Monitoring Report.

The Council's Fish and Wildlife Program calls for the preparation of a "monitoring and evaluation" report.  The StreamNet project has been charged with  preparing a report that summarizes salient aquatic resource data and trends and that can be used as a principal foundation for the Council's monitoring and evaluation report.

***Task 4.1  Produce an annual monitoring report that will include the following anadromous fish information: Freshwater and Ocean Distribution; Juvenile and Adult Abundance; Harvest; Subbasin and Mainstem and Ocean Conditions; Protection and Restoration Activities; Bibliography; Detailed Stock Summaries***

Information on fish populations, fisheries, and fish habitat is crucial to the success of ongoing programs to protect, recover, enhance, and manage fish resources in the Columbia River Basin.  However, pertinent data is often difficult to locate because it is scattered among many agencies and is often unpublished.

As requested by the Northwest Power Planning Council, the first annual "data summary report" was produced and widely distributed in April 1996. The goal of this annual report was to bring many diverse data types and sources into a single comprehensive report on the status of anadromous fish runs in the Columbia River Basin and the environmental conditions that may affect that status. The report is intended to complement other more detailed reports to which readers are referred for comprehensive treatment of specific subjects. Titled "StreamNet:  Report on the Status of Salmon and Steelhead in the Columbia River Basin - 1995,"  the report was distributed to over 1,000 individuals and organizations in the region.  Brief summaries were provided to identify the type and scope of available information.

The 1996 report focused mainly on anadromous salmon and steelhead, in most cases using data current through 1994.  Most of the summary data in the report was generated using the StreamNet database system.  Data in the report that came from sources other than the StreamNet database were cited in the bibliography.  Fundamental to the report was the decision to focus on the reporting of data rather than evaluating the implications of these data.

To facilitate the presentation of large amounts of data, the Columbia River Basin was divided into four regions.  The regions were defined as follows:  Below Bonneville - the Columbia River and its tributaries below Bonneville Dam;  Bonneville to Priest Rapids - the Columbia River and its tributaries between Bonneville Dam and Priest Rapids Dam;  Snake - the Snake River and its tributaries up to Hells Canyon Dam; and Priest Rapids to Chief Joseph - the Columbia River and its tributaries between Priest Rapids Dam and Chief Joseph Dam.

The report has received favorable reviews.  The region's resource managers have been invited to offer suggestions for the types of data that should be considered for future editions.  It is the

intent of project participants to expand the scope to include resident fish as these data become available.

Copies of this report are available through:

Bonneville Power Administration
Public Information Center - CKPS-1
P.O. Box 3621
Portland, OR  97208

Refer to:    DOE/BP-65130-1  MAY 1996  1M

# Objective 5.  Project Management

Project management involves the oversight of the variety of activities involved in the project. Management is particularly important in a multi-agency effort of this nature.  Project management involves both overall project management at the regional level and management within each of the participating agencies.  The project employed a management team consisting of a project manager and regional data manager at PSMFC and a steering committee consisting of the project managers from each of the participating agencies and the BPA COTR.  The following seven tasks constituted the focus for FY 1996 project management activities:

## Task 5.1  Steering Committee

There were 5 StreamNet Steering Committee held during FY 1996 on the following dates:

> October 24-25, 1995
> December 12-13, 1995
> February 20-21, 1996
> June 18-19, 1996
> August 20-21, 1996

Two additional meetings of the full steering committee were also held.  One, on November 29, 1995 addressed technical and administrative issues pertaining to the merger of the NED and CIS projects.   The other, held on April 23-24, 1996, focused on issues related to the River Reach System and the use of GIS technology in this project.

## Task 5.2  Quarterly reports

A new format for quarterly reports was adopted in FY 1996.  Quarterly progress reports were prepared by each organization funded to work on the StreamNet project.  Reports were submitted for the periods of: October - December 1995; January - March 1996; and, April - June 1996.  An agreement was also reached with the BPA COTR that the StreamNet Annual Report would be adequate for documenting the period of July - September 1996, the final quarter of the Fiscal Year.  Quarterly progress reports for the StreamNet project are available upon request from PSMFC.

Within one week following receipt of quarterly progress reports, a single compiled project progress report was submitted to the Bonneville Power Administration.  Reports were submitted usually within one month after the end of a particular quarter.

***Task 5.3  Prepare and submit an Annual Report that documents past year progress and
describes proposed future directions.***

This document is the product for  this task.


***Task 5.4  Prepare a statement of work and budget for FY 97.***

The FY 1997 Statement of Work and budgets were prepared and submitted to the Bonneville
Power Administration.  Following revisions, the FY 1997 Statement of Work and budgets were
approved on December 4, 1996.


***Task 5.5  Coordinate activities and services with other appropriate regional projects and
organizations.***

Both the project manager and members of the steering committee maintained an ongoing
commitment to coordinating StreamNet activities with those of other relevant projects and
activities.  Formal and informal briefings were held on an as needed basis and project participants
actively monitored such activities as the Integrated Hatcheries Operation Team, the BPA and
Council-sponsored PATH project, Model Watersheds, IRICC, and others.  The results of these
activities is reflected in the FY 1997 work statement, which includes tasks related to several of
these activities.


***Task 5.6  Produce public information material and topical reports (as needed and approved).***

Long and short versions of a project brochure were produced, with a final scheduled for FY 1997.
 A PowerPoint project demonstration was prepared and delivered to interested parties.  A topical
report was prepared in conjunction with the PATH project entitled "Spawner Recruitment
Relationships for Spring and Summer Chinook."  A briefing packet was prepared for the
Northwest Power Planning Council.


***Task 5.7  Participate in regional and national conferences to describe and promote the
StreamNet.***

The StreamNet librarian attended relevant professional library meetings including the NRIC
annual meeting and the October 1996 IAMSLIC conference.  Project participants attended and,
where appropriate, made presentations at state and regional meetings and conferences.  Examples
include the Idaho Department of Health's water quality conference and a region-wide watershed
conference held in Pendelton, OR.  Participants did not attend any out-of-region conferences
during FY 1996.

# Objective 6.  StreamNet Consolidation

FY 1996 was the first year in which the Northwest Environmental Database and Coordinated Information System projects were joined to form StreamNet.  As part of the necessary efforts to successfully join these two projects, and to plan for the future, the Bonneville Power Administration approved a separate contract to allow for the needed staff assistance.  This contract also covered work involved in maintaining the River Reach System as described under Objective 7.  Five tasks related to the consolidation were included in the work statement as follows:

### Task 6.1  Prepare and adopt a mission statement for the joint project.

A mission statement was prepared and will be included in future brochures, the web site, and other relevant materials.

### Task 6.2  Prepare a report addressing key considerations in merging the CIS and NED projects and provide recommendations for how each should be addressed.

This report was prepared, reviewed with the steering committee and BPA, and adopted on December 12, 1995.  The report is entitled "Protocol for Consolidation of the Northwest Environmental Database and the Coordinated Information System."

### Task 6.3  Prepare a report that 1) identifies existing and potential applications for the combined StreamNet project; 2) recommends which of these applications should be the focus of StreamNet efforts; 3) quantifies benefits to the region from these data coordination and information service efforts.

This task was incorporated into the larger effort to prepare a strategic plan.  See task 6.4 for further details.

### Task 6.4  Prepare a five-year plan (Strategic Plan) for the combined StreamNet project.

Project management and steering committee spent considerable time on the topic of strategic planning for the future of StreamNet.  The discussion was initiated through development of "Protocol for Consolidation of the Northwest Environmental Database and the Coordinated Information System " discussed in task 6.2 above.  The discussions which led to the new name of StreamNet was also an important part of the strategic planning process.  Four internal documents were prepared that specifically addressed strategic planning.  The first was a paper entitled

"Strategic Plan development" (February 21, 1996) which presented the basic issues that must be addressed in a strategic plan. Included was a list of potential users and applications. "Strategic Plan Questions" (April 2, 1996) identified the relevant questions that must be addressed in a strategic plan. "StreamNet Present and Future" (June 18, 1996) presented an outline of the plan. A revised version of the June document was released on July 8, 1996. This version presented a detailed outline of the plan, together with several of the actual items that will be included in the plan. The July 8 version was accompanied by a "draft StreamNet Data Plan" which identified many of the specific data items that will be included in the plan. The "Technical Applications Development Strategy" described in task 3.5 above must also be considered a component of the strategic plan. During August and September the emphasis shifted to specific elements of the strategic plan, namely the FY 1997 work statement and implementation of the Technical Applications Strategy. The decision was made to postpone preparation of a final plan document until FY 1997.

### Task 6.5  Prepare a detailed strategy for accomplishing the compilation of a regionally consistent dataset regarding fish distribution, habitat and related factors.

The project addressed sub-tasks 6.5.1 through 6.5.3 by means of specific discussions on the subject at steering committee meetings and the preparation of working papers on the subject. In November 1995 the project completed a paper entitled " Future Directions for Anadromous and Resident Fish Data Development" which outlined the types of data that should be included in the long-term data development strategy. In July 1996 a draft "StreamNet Data Plan was released which incorporated the concepts from the earlier paper. (This is discussed in task 6.4 above.) In addition, in May 1996 a paper was produced entitled " Fish Distribution Update" which described the status of our efforts to enhance our fish data. Special emphasis was placed on the issue of fish distribution.

The project addressed sub-task 6.5.4 mainly through active participation in the IRICC fish and hydro strike team. That team produced the report described in task 1.5. This report will provide the underpinning for future interagency stream habitat data collection. Project participants also initiated discussions among the state fish and wildlife agencies regarding closer coordination among these agencies in data collection. These discussions lead to an interagency meeting on the subject held in early FY 1997.

# Objective 7. River Reach System Maintenance

Work towards fulfillment of River Reach System Maintenance tasks was largely fulfilled through a sub-contract to the U.S. Geological Survey's Water Resources Division (USGS WRD) in Portland, OR. USGS, with assistance from other participants, was involved in ten tasks related to maintenance of the River Reach System.

***Task 7.1  Consolidate regionally consistent 1:100,000 PNW river reach system and DLG data.***

Available PNW Reach files were consolidated and may be accessed through the World Wide Web via the USGS home page. There is a hot link from the StreamNet home page to that site. These are the files that were produced under the Clearinghouse contracts funded by the BPA and contracted through the Oregon State Service Center for GIS. They do not include additional features such as Route and Stream Identification numbers, now considered a separate version of the PNW Reach Files.

***Task 7.2  Prepare necessary documentation concerning the contents of the River Reach System.  This will involve a review of existing documentation with refinement for StreamNet needs.***

In fulfillment of this task the USGS published Water-Resources Investigations Report 94-4043 - "Methodology used to produce an encoded 1:100,000-scale digital hydrographic data layer for the Pacific Northwest."

Additional information concerning the PNW Reach Files was prepared and is available through the USGS Web site. This includes electronic versions of a fact sheet, data dictionary, meta data, frequently asked questions and other information.

Documentation was not refined to incorporate any additional enhancements that have occurred with the Reach Files. This task will await completion of the National Mapping Division DLG-F product to be known as the National Hydrographic Database (NHD).

***Task 7.3  Produce a summary of the contents and uses of the River Reach System for general use within the region.***

A description of uses for the Reach Files was prepared and is described in the meta-data files that accompany each Reach File.

***Task 7.4  Develop and implement protocol for adding streams to the digital layer and other
modifications which may be desirable.***

No mechanism was developed for adding streams to the PNW Reach Files as this is a component
of the NHD project. The EROS DATA Center has undertaken the task of developing tools for
updating the NHD product including tools to add streams from other map scales.

***Task 7.5  Develop and implement procedures for maintaining River Reach System.***

An explanation of what to do should a user find graphic or attribute errors with the reach files has
been prepared and is included on the PNW Reach File Web page.

Maintenance of the PNW River Reach System has been accomplished through a cooperative
effort among USGS WRD and the four state fish and wildlife agencies.  Coordination was
typically handled via e-mail and  telephone communication.

The PNW files were updated as needed; a chronological log file is maintained on the PNW Reach
File Web page.  This serves to alert users concerning which files have been changed.

***Task 7.6  Establish and implement/maintain mechanisms for effective communication and
cooperation among states and other project participants resulting in regional
standardization of the PNW reach files.***

Because of the small number of regional PNW Reach Files users, most communication was
accomplished through e-mail groups or by phone conversations. When needed, teleconferencing
was used. Users are aware of the future of the PNW files and are being kept up-to-date on the
NHD effort through correspondence generated by the National work groups.

***Task 7.7  Provide technical assistance to Fish and Wildlife Program and other appropriate
regional projects that will use the Reach File System.***

The USGS WRD has maintained continual contact with state Reach Files users and has provided
technical assistance in the development of recent enhancements.  The most evident project
assistance came in the effort to add Route ID's and stream identification numbers to the PNW
files. The USGS hosted meetings with those involved and was in phone and e-mail contact during
the time the work was being done.

***Task 7.8  Maintain contact with USEPA national 1:100,000- scale effort.  Provide comments and assistance to USEPA for incorporating the PNW Reach Files into the new national layer.***

Throughout FY 1996 the USGS WRD has been an active participant in the development of the NHD. The USGS has attended workshops, given presentations at some of these workshops and provided input in many teleconference calls.

The USGS WRD is currently assembling the PNW Reach Files into a format that will be shipped to the EPA for inclusion in the NHD pre-processing initiative.


***Task 7.9  Cooperate with participating agencies to provide assistance to StreamNet initiatives. Services may include providing GIS expertise, when needed.***

The USGS has worked with the states to promote regional consistency in the regional Route ID and Stream - ID numbering effort. The USGS WRD also prepared software programs to ensure that the STREAM-ID is consistent among the states.


***Task 7.10  Participate in the development of mechanisms for providing digital data and other StreamNet products to the public via the WWW and other data transfer technologies.***

This task was integrated with general StreamNet web site development as described in task 3.5. Further effort will be made on this in conjunction with completion of the NHD in  FY 1997.

# APPENDIX A.

# Primary StreamNet Participants in FY 1996

(Project coordinators for each agency are listed first.)

Bonneville Power Administration

Tom Pansky
Steve Gordon

Columbia River Inter-Tribal Fish Commission

Phil Roger
Keith Hatch
Gretta Seigel

Idaho Department of Fish and Game

Jerome Hansen
Evan Brown
Bart Butterfield
Terry Elms-Cockrum
Lawrence Hartpence
Daniel King
Doug Reece

Montana Dept. of Fish, Wildlife & Parks

Janet Decker-Hess
Lydia Bailey
Jeff Hutten
Angie Schmidt

National Marine Fisheries Service

Steve Stone
Bob Emmett
Paul Genovese

Northwest Power Planning Council

Chip McConnaha
Peter Paquet

Oregon Department of Fish and Wildlife

  Ray Beamesderfer
  Gloria Bourne
  Brent Forsberg
  Milt Hill
  Keith Hupperts
  Eric Tinus

Pacific States Marine Fisheries Commission

  Stan Allen
  Duane Anderson
  Gary Christofferson
  Drew Parkin

Shoshone-Bannock Tribes

  Mike Rowe
  Doug Taki

U.S. Fish and Wildlife Service

  Steve Pastor

U.S. Geological Survey

  Bruce Fisher

Washington Department of Fish and Wildlife

  Dick O'Connor
  Larry Brown
  Cindy Burns
  Brodie Cox
  Peter Hahn
  Martin Hudson
  Leslie Sikora
  Bob Woodard

# APPENDIX B.

# StreamNet FY 1996 Abbreviated Work Plan

**Objective 1. Data Compilation**

**Task 1.1** Design, develop, maintain standard codes/formats for data set exchange.

**Task 1.2** Compile, manage, update, maintain and document standardized data and begin collection of anadromous fish data outside the Columbia River Basin. All data shall be cross-referenced to the EPA Reach System.
- **1.2.1** Adult abundance data set for both natural and hatchery stocks.
- **1.2.2** Juvenile abundance data set.
- **1.2.4** CWT recovery data set.
- **1.2.5** Natural production data set (egg-smolt, age composition, fecundity, genetics, disease, etc.).
- **1.2.6** Mainstem adult data (upstream passage) including conversion rates, and estimates of fallback.
- **1.2.7** Hatchery release data set.
- **1.2.8** Hatchery facility and practices data set (in consultation with IHOT).
- **1.2.9** Harvest data set which includes ocean, inriver, and terminal harvests.
- **1.2.10** Mainstem parameter data set (flow, spill, temperature, and nitrogen saturation data).
- **1.2.11** Ocean conditions data set (where data are available)
- **1.2.12** Water quality and quantity set.
- **1.2.13** Project data set (type, location, duration, benefits, costs).
- **1.2.14** Data Set Directory.

**Task 1.3** Document data to StreamNet Library with corresponding "short" reference and physical documents used.
- **1.3.1** Code all data compiled in Task 1.2 with a unique reference number (assigned) and a short reference file which will include, at a minimum, the unique number, author(s), and title of the document or data set.
- **1.3.2** Copy or collect 1 physical copy of each reference source (unless data set) and code front right cover with the corresponding unique reference number.
- **1.3.3** Submit all physical copies of reference material to the StreamNet Library.
- **1.3.4** Submit short reference file with data submitted in Task 1.2 to the StreamNet Regional Office.

**Task 1.4** Prepare 100k base maps, compile and encode data on anadromous and resident fish distribution and related factors.
- **1.4.1** Prepare 1:100,000 scale GIS maps for each basin within the four state area.
- **1.4.2** Attach existing data on species distribution, migration barriers, life stages, and other appropriate factors to 1:100,000 base maps.
- **1.4.3** Prepare field maps or, as appropriate, GIS data entry screens.
- **1.4.4** Identify and organize fisheries biologists who will participate in the project.
- **1.4.5** Conduct a test case in one basin in each state.
- **1.4.6** Arrange data input sessions for each basin or aggregates.
- **1.4.7** Review and revise anadromous fish data, including species distribution, migration barriers, and life stages.
- **1.4.8** Review and revise resident fish data on species distribution, life stages, abundance, and recreational use.
- **1.4.9** Attach mapped data to 1:100,000 digital line graphs.
- **1.4.10** Enter tabular data into database using 1:100,000 river reach file system.
- **1.4.11** Check digital maps for accuracy and revise.
- **1.4.12** Check tabular database for accuracy and revise.

**Task 1.5** Begin development of a comprehensive aquatic habitat database
- **1.5.1** Establish a core dataset / exchange format
- **1.5.2** Identify existing sources and incorporate data into database as applicable
- **1.5.3** Develop long term strategy for inter-agency habitat data compilation and exchange

**Task 1.6** Maintain and enhance the 1:100,000 river reach tabular and graphic files.

**Task 1.7** Develop data exchange procedures with Columbia Basin tribal fishery programs.
- **1.7.1** Identify and document data sets collected by tribal programs which are relevant to the StreamNet project.
- **1.7.2** Identify existing tribal data management procedures.
- **1.7.3** Working with tribal natural resource programs, develop recommended procedures for providing relevant information to StreamNet.
- **1.7.4** Compile and integrate tribal data sets which are not presently in the StreamNet databases, according to recommendations of 1.7.3.

**Objective 2. Library/Reference Services**

**Task 2.1** Material acquisition for StreamNet
- **2.1.1** Collect one copy of all documentation assembled by other participants under Task 1.2.

**2.1.2**    Collect one copy of new reports published by the BPA under the Fish and Wildlife Program, and continue to locate older reports not presently in the collection.

**2.1.3**    Continue to build the collection of published and gray literature from participating fish management agencies.

**2.1.4**    Provide appropriate facilities for storage of the physical collection.

**2.1.5**    Organize and maintain the physical collection for appropriate on-site usage.

**Task 2.2**  Continually update, maintain, and provide an electronic bibliography of references pertinent to fish and wildlife issues in the region.

**Task 2.3**  Catalog references for StreamNet.

    **2.3.1**    Catalog reports collected under Task 2.1.

    **2.3.2**    Continue to catalog the CRITFC technical library collection.

    **2.3.3**    Update reference dataset as needed.

**Task 2.4**  Develop and provide library services for the StreamNet user community, as described in the StreamNet Library Users Manual.

    **2.4.1**    Maintain and update a Library User's Manual which describes services available and usage policies.  This document will include:

        - Use of the search features of the Distributed System

        - A description of material maintained in the physical collection

        - How to request material from the StreamNet reference service

        - Custom services available (e.g. searching outside CIS, referrals to other available systems, etc.)

        - On-site use of the StreamNet Library located at CRITFC

        - Fees involved with some services

    **2.4.2**    Publicize services available through the StreamNet Library.

    **2.4.3**    Provide services as described in the StreamNet Library User's Manual upon request..

    **2.4.4**    Collect information about other regional fisheries library collections and access policies.

    **2.4.5**    Provide consultation for agencies and groups on ways to coordinate catalogs and services.

    **2.4.6**    Coordinate with users, agencies, and regional libraries to improve service and avoid unnecessary duplication.

    **2.4.7**    Provide user training on available regional library resources and access methods, including Internet.

**Task 2.5**  Maintain standard keyword list for all StreamNet products

## Objective 3.  Information Services

**Task 3.1**  Receive and respond to requests for data/information.

**Task 3.2**  Continue to operate a Bulletin Board System for use by project participants/customers.

    **3.2.1**    Manage and maintain the StreamNet Bulletin Board service (CISNET), adding new groups as appropriate.

    **3.2.2**    Continue to support the Internet E-mail connection through Wildcat!

**Task 3.3**  Administer the StreamNet datasets.

    **3.3.1**    Fully document the structure of the current system with a data dictionary and definition of standard reports.

    **3.3.2**    Incorporate additional reports into the system design, as appropriate.

    **3.3.3**    Incorporate additional datasets into the design, as appropriate.

**Task 3.4**  Refine and enhance StreamNet database structures and capabilities.

    **3.4.1**    Continue database normalization as needed.

    **3.4.2**    Modify the database to match the structure defined in task 3.3.

    **3.4.3**    Add report routines to match the definitions in task 3.3.

    **3.4.4**    Add routines to import exchange data.

**Task 3.5**  Develop and maintain appropriate data access systems.

    **3.5.1**    Maintain Windows version of the DS and incorporate updated information.

    **3.5.2**    Distribute DS to users.

    **3.5.3**    Produce a draft and final technical applications strategy and implementation plan to provide Internet access to products (including text, tables, charts, maps, etc.) via WWW.

    **3.5.4**    Develop, test, and document functional client-server prototype for access to StreamNet via WWW. Components include 1) SQL data engine hosting attribute data sets; 2) on-line linkage between SQL host and GIS; 3) an HTML based user interface.

**Task 3.6**  Provide data infrastructure, services, and documentation for data input and conversion to data exchange formats..

**Task 3.7**  Prepare documentation of data delivery system(s).

    **3.7.1**    Update the user's manual as needed

    **3.7.2**    Revise as necessary the on-line users manual using the Windows help system.

**Task 3.8**  Test and distribute the information access system(s).

    **3.8.1**    Test the information access systems and verify the data contents before full distribution.

    **3.8.2**    Distribute the information access systems and data after testing.

    **3.8.3**    Maintain database of users which contains affiliation and type of system and keep users apprised of system/data updates.

        **3.8.4**      Maintain database of problems and corrections related to various releases of access systems.

**Task 3.9**  Provide training to StreamNet end users.
        **3.9.1**      Develop training materials relevant to StreamNet services and features.
        **3.9.2**      Provide training to users as needed.

## Objective 4.  Monitoring Report.

**Task 4.1**  Produce an annual monitoring report that will include the following anadromous fish information:
        - Freshwater and Ocean Distribution
        - Juvenile and Adult Abundance
        - Harvest
        - Subbasin and Mainstem and Ocean Conditions
        - Protection and Restoration Activities
        - Bibliography
        - Detailed Stock Summaries

## Objective 5.  Project Management

**Task 5.1**  Steering Committee
        **5.1.1**      Attend and participate in six (6) scheduled Steering Committee meetings.
        **5.1.2**      Attend and participate in special coordination or work team meetings as needed.
        **5.1.3**      Provide oversight and direction for StreamNet development and management.
        **5.1.4**      Serve as StreamNet liaison both internally and externally of respective organizations.
        **5.1.5**      Define processes, policies, procedures and resource needs for StreamNet activities.

**Task 5.2**  Quarterly reports
        **5.2.1**      Prepare quarterly progress reports for the periods (Oct-Dec 1995, Jan-March 1996, April - June 1996, July - Sept 1996) in an agreed standard format and submit to StreamNet Program Manager.
        **5.2.2**      StreamNet Program Manager will compile individual reports and submit to BPA COTR and PSMFC Administration.

**Task 5.3**  Prepare and submit an Annual Report that documents past year progress and describes proposed future directions.

**Task 5.4**  Prepare a statement of work and budget for FY 97.

**Task 5.5**  Coordinate activities and services with other appropriate regional projects and organizations (e.g., Integrated Hatcheries Operation Team, USFWS Wild Stock Assessment Team, Natural Production Scoping Group, Comprehensive Environmental Assessment, IRICC, Model Watershed, etc.)
        **5.5.1**      Interact with other Fish and Wildlife Program projects involved in data collection and analysis activities.
        **5.5.2**      Consult with BPA, the Council, and others in identifying the scope and responsibilities of StreamNet with respect to other Fish and Wildlife Program activities.
        **5.5.3**      Interact with other applicable fish and wildlife projects involved in data collection and analysis activities.

**Task 5.6**  Produce public information material and topical reports (as needed and approved).
        **5.6.1**      Revise and distribute the StreamNet Brochure as necessary.
        **5.6.2**      Prepare and distribute topical reports and papers as necessary or requested.
        **5.6.3**      Prepare multi-media presentation materials that describe the StreamNet project, its features and services.

**Task 5.7**  Participate in regional and national conferences to describe and promote the StreamNet.

## Objective 6.  StreamNet Consolidation

**Task 6.1**  Prepare and adopt a mission statement for the joint project.

**Task 6.2**  Prepare a report addressing key considerations in merging the CIS and NED projects and provide recommendations for how each should be addressed.

**Task 6.3**  Prepare a report that 1) identifies existing and potential applications for the combined StreamNet project; 2) recommends which of these applications should be the focus of StreamNet efforts; 3) quantifies benefits to the region from these data coordination and information service efforts.

**Task 6.4**  Prepare a five-year plan (Strategic Plan) for the combined StreamNet project.

**Task 6.5**  Prepare a detailed strategy for accomplishing the compilation of a regionally consistent dataset regarding fish distribution, habitat and related factors.

        **6.5.1**      Refine existing PSMFC proposal for collection/compilation of these data and gain concurrence by participating agencies.
        **6.5.2**      Prepare a detailed work plan for accomplishing the compilation of fish species data.
        **6.5.3**      Organize the team that will be involved in this effort.
        **6.5.4**      Establish an agreement among appropriate agencies regarding the long-term collection of stream habitat data.

## Objective 7. River Reach System Maintenance

**Task 7.1** Consolidate regionally consistent 1:100,000 PNW river reach system and DLG data.

**Task 7.2** Prepare necessary documentation concerning the contents of the River Reach System. This will involve a review of existing documentation with refinement for StreamNet needs.

**Task 7.3** Produce a summary of the contents and uses of the River Reach System for general use within the region.

**Task 7.4** Develop and implement protocol for adding streams to the digital layer and other modifications which may be desirable.

**Task 7.5** Develop and implement procedures for maintaining River Reach System.

**Task 7.6** Establish and implement/maintain mechanisms for effective communication and cooperation among states and other project participants resulting in regional standardization of the PNW reach files.

**Task 7.7** Provide technical assistance to Fish and Wildlife Program and other appropriate regional projects that will use the Reach File System.

**Task 7.8** Maintain contact with USEPA national 1:100,000- scale effort. Provide comments and assistance to USEPA for incorporating the PNW Reach Files into the new national layer.

**Task 7.9** Cooperate with participating agencies to provide assistance to StreamNet initiatives. Services may include providing GIS expertise, when needed.

**Task 7.10** Participate in the development of mechanisms for providing digital data and other StreamNet products to the public via the WWW and other data transfer technologies.