

Fiscal Year 1997 Statement of Work

StreamNet:

The Northwest Aquatic Resource Information Network

(October 1, 1996 - September 30, 1997)

Introduction

Project Summary. The combined Coordinated Information System (CIS) / Northwest Environmental Database (NED) was renamed StreamNet in Fiscal Year 1996. The project provides data services and other technical support for activities associated with the Northwest Power Planning Council's Northwest Conservation and Electric Power Plan and Fish and Wildlife Program and for related planning, policy, and management activities at the state and regional levels. StreamNet consists of a series of databases and reference materials concerning anadromous fish, resident fish, wildlife, and related aquatic resources in the four state Pacific Northwest region. Included are data on fish production (both natural and hatchery), fish and wildlife distribution, habitat characteristics and condition, source material references, stream hydrography, and other environmental factors. A project data plan identifies additions and enhancements planned for the future. Tabular information can be accessed through custom PC-based interfaces and much of the data is also available using Geographic Information System (GIS) technology. The StreamNet home page on the World Wide Web of the Internet debuted in July 1996, showcasing samples of tabular and graphic data contained in StreamNet. (The home page continues to be refined and enhanced; in FY 97 the sample data will be replaced with a far more detailed and comprehensive set of tabular and graphic data.) Source materials are available through a library housed and maintained at the Columbia River Inter-Tribal Fish Commission in Portland, Oregon, a StreamNet partner organization.

StreamNet Goals and Objectives. The overall goal of the project is to create, maintain, enhance, and provide public access to a regionally consistent set of fish, wildlife, and related resource data that is directly applicable to regional policy, planning, and management. Specific objectives include:

1. Fish and Wildlife Program. Serve as the primary mechanism for coordinating fish and wildlife data related to the Northwest Power Planning Council's Fish and Wildlife Program by maintaining and providing public access to essential existing data, supplying Program projects with data and computerized maps, serving as a repository for data collected through these projects, and providing information services for tracking projects and, ultimately, evaluating their effectiveness.
2. Other Fish and Wildlife Initiatives. Provide data and services to activities within the region that are related to the conservation of fish and wildlife resources and that complement the Fish and Wildlife Program, including Endangered Species Act (ESA) activities, regional

environmental analyses, tribal resource management, state-level policy and planning, and federal land and resource management agency activities.

Project Organization. The StreamNet project is a cooperative effort on the part of many organizations involved in the management of fish and wildlife resources. The project is managed by the Pacific States Marine Fisheries Commission (PSMFC), under contract to the Bonneville Power Administration (BPA). The Northwest Power Planning Council (Council) provides policy oversight. Other agencies with a contractual commitment to the project include:

Columbia River Inter-Tribal Fish Commission (CRITFC)
Idaho Department of Fish and Game (IDFG)
Montana Fish, Wildlife and Parks (MFWP)
Oregon Department of Fish and Wildlife (ODFW)
Shoshone-Bannock Tribes (Sho-Ban)
U.S. Fish and Wildlife Service (USFWS)
Washington Department of Fish and Wildlife (WDFW)

Additional agencies that participate in certain aspects of the project and/or are significant beneficiaries of project products, include:

Bureau of Land Management (BLM)
Environmental Protection Agency (EPA)
National Marine Fisheries Service (NMFS)
U.S. Forest Service (USFS)
U.S. Geological Survey (USGS)

PSMFC's project management team includes a project manager responsible for overall project coordination, and a data manager responsible for overseeing development of the StreamNet data system. Each participating agency has designated a project coordinator who serves as the principal contact person within the organization and is responsible for ensuring that the agency meets its obligations regarding the project work statement. Much of the actual data development and compilation occurs at the state level. Project coordinators within each of the four state fish and wildlife agencies oversee this and ensure that appropriate state-level data services are provided. A Steering Committee, consisting of the regional project management team and coordinators from participating agencies, provides the principal means for interagency coordination and communication, and for ensuring the needs of each agency are being addressed. BPA has assigned a Contracting Officer's Technical Representative (COTR) to oversee the StreamNet contract. BPA has responsibility for ensuring that the project work statement adequately addresses Fish and Wildlife Program requirements in a cost effective manner, and that satisfactory progress is made toward producing work statement deliverables.

Funding. The project is a component of the Council's Fish and Wildlife Program and receives funding through the BPA. The project is also supported through contributed services on the

part of participating agencies and through limited contracts and other forms of financial support from participating agencies and others.

Currently, PSMFC is party to three interagency agreements that are directly related to the StreamNet project and that are funded from sources other than BPA. These include 1) a contract with the EPA (\$60,000) to conduct a “visual pass” on the soon-to-be-released National Hydrographic Dataset - a necessary step to make the new 1:100,000-scale Pacific Northwest river reach system fully operational and to integrate it with the national system, 2) a contract with the USFS (\$50,000) to assist in developing the technical foundation necessary for collection of regionally-consistent stream habitat data, and 3) a contract with the NMFS (\$250,000) to review a large volume of anadromous fish data compiled by NMFS contractors and integrate these data into StreamNet. Many of the tasks that will be undertaken through these contracts would have otherwise been integrated into the BPA work statement, either in FY 97 or future years. Work on these non-BPA funded tasks will, at least in part, be undertaken by StreamNet staff attached to PSMFC and participating agencies. Time allocations will be closely monitored to ensure that the proper project is billed for staff efforts.

Work undertaken through each of the contracts identified above will directly benefit the StreamNet project and help to accomplish StreamNet goals. Collaborative funding of this nature is consistent with the strategic plan being drafted for the StreamNet project and is particularly important if the project is to include data that is region-wide in scope. Project participants will pursue funding from these and other sources to support data development activities that complement overall StreamNet goals - especially for data development outside of the Columbia Basin.

PSMFC works with all west coast states on fisheries issues. By virtue of these relationships StreamNet will also be able to provide Northwest natural resource managers with some data from California, Alaska, and British Columbia. The StreamNet team intends to maintain active contacts with data development efforts in California, Alaska, and British Columbia in order to promote the development of StreamNet-type data coast-wide.

This statement of work addresses tasks that will be performed using BPA-administered Fish and Wildlife Program funds. StreamNet-related activities that will be undertaken using non-Fish and Wildlife Program funds are, with minor exceptions, not reflected in this work statement. The exception is Task 4.3, which is included in order to show how this task links to other StreamNet tasks.

Work Plan Summary

Overview of Tasks. The work plan which follows identifies six primary objectives that the StreamNet project will address in FY 1997. For each objective the work plan identifies a number of tasks that will be completed during the fiscal year. Tasks are divided into sub-tasks as appropriate. For each task one or more products are identified, as are timelines for product delivery. Attachment II identifies the professional staff who will be involved in the project and the amount of time that each will allocate to the project. Attachment III presents a

proposed budget for the project for FY 1997. Included are an overall budget and a budget for each participating organization.

The work plan is the product of a concerted effort on the part of participating agencies to target high priority data in light of current and projected needs. The work statement links directly to the StreamNet Data Plan, which identifies data currently in the system, data that should be compiled over the next five years, and, within this, data that should receive priority for FY 97. For FY 97, anadromous fish productivity trends will continue to be a priority, as will identification of resident and anadromous fish distribution and life stage use. Available anadromous fish age and population data will be incorporated as will biological data on resident fish. Additional areas that will receive attention are aquatic habitat, man-made stream facilities, and tracking of fish and wildlife planning and restoration projects. The 1:100,000-scale river reach system will be enhanced and made fully operational. Substantial effort will be given to enhancing the project's data management and data delivery services, with development of interagency data exchange formats and Internet access receiving significant attention. The StreamNet Library's ability to provide services to the fish and wildlife management community will likewise be enhanced.

Budgetary Changes for FY 97. Items that represent a significant change from how project funding was allocated in FY 96 are as follows:

1. Library Services. The FY 97 budget includes funds to lease additional library space and to provide the supplies and equipment necessary to make the library fully operational (Task 3.2(a)). The current library space, which is donated as an in-kind contribution by the Columbia River Inter-Tribal Fish Commission (CRITFC), will continue to be used as a closed stacks area. The new space will provide street-level access and its physical layout will more adequately meet the needs of the public user. It will also provide much needed space for an expanding collection of fish and wildlife-related documents. In particular, the expanded space will be used to house significant portions of the Council's existing Fish and Wildlife Program collection and documents associated with National Marine Fisheries Service ESA activities, including a copy of the NMFS administrative record (see Task 3.1(c and d)).
2. Tribal Fish and Wildlife Data. The budget includes funds to assist the four CRITFC member tribes in providing data to StreamNet. These funds will secure the services of a fisheries biologist from each tribe for approximately one-half time for FY 97. Tribal biologists will mostly participate in data development under Task 1.1, with responsibilities to include: a) reconciling StreamNet and tribal records, b) providing new data, and c) establishing mechanisms for smooth flow of data between the tribes and StreamNet in the future. Tribal biologists will also assist in securing tribal data associated with Tasks 1.2 through 1.7. Involvement of CRITFC member tribes will be facilitated by CRITFC staff and funded through CRITFC sub-contracts.
3. GIS Data Management. The work plan includes several tasks that will require the services of a GIS data manager. The addition of this position is a response to increased demand for data that can be compiled, displayed, and/or analyzed using GIS technology and

the associated need to expand the regional capability to address GIS-related data management issues. The GIS data manager will be a member of the regional data management team and will be located at PSMFC. During FY 97 the GIS data manager will work full time on the StreamNet project in close coordination with the Regional Data Manager and BPA's GIS team and will be responsible for both producing regional products and coordinating state-level GIS efforts aimed at producing regionally consistent products. Care will be taken to ensure a minimum of duplication with ongoing regional GIS work at BPA.

The GIS data manager will contribute to completion of the following work statement tasks:

- Task 1.1: Integrate spatial data related to anadromous fish into StreamNet.
- Task 1.2: Integrate spatial data related to resident fish into StreamNet.
- Task 1.3: Integrate spatial data related to habitat into StreamNet.
- Task 1.6: Integrate spatial data related to wildlife into StreamNet.
- Task 1.7: Integrate spatial data related to management and project tracking into StreamNet.
- Task 2.1: Design data exchange formats, formats for Fish and Wildlife Program projects.
- Task 2.3: General data management.
- Task 2.5: Develop GIS data catalog.
- Task 2.6: Establish GIS coordination protocol.
- Tasks 4.3, 4.4, and 4.6: Refine and maintain 100K river reach system.
- Task 4.7: Acquire data layers.
- Task 5.1: General data delivery services.
- Task 5.3: Internet access to GIS data.
- Task 5.6: Prepare GIS components of annual salmon and steelhead report.
- Task 5.7: Prepare regional GIS products.

4. Hardware and Software. The budget includes funds to acquire the hardware and software necessary to accomplish specific tasks. These include a GIS work station, plotter, and GIS software to support the GIS data manager described in # 3 above, and software required to implement Task 5.3. This task involves development of a system to provide StreamNet data (both tabular and spatial) to users via the Internet and to allow user-defined data query. Specific data delivery hardware and software requirements will be determined midway through FY 97 in accordance with a development strategy prepared during FY 96. The budget accompanying this work plan does not include funds to acquire these items as specifics are not yet defined. Probable hardware and software needs include an SQL server, operating system, SQL software and spatial data engine (SDE). When specific needs are known a contract modification will be initiated.

5. In-season Data. Discussion continues regarding StreamNet's role in packaging and delivering "real time" fish, hydrology, water quality, and dam operations data. The complexity of this issue, coupled with historic interagency sensitivities, indicate the need for interagency evaluation prior to making a decision. Task 1.10 calls for StreamNet to undertake a scoping project aimed at determining how best to meet in-season data needs for the 1997 migration season. The work plan does not include tasks nor budget for actually implementing the in-season data project.

Task 1.10 is independent of other tasks and decisions regarding that task need not affect decisions regarding the rest of the work plan.

Funding the items described immediately above will not involve an increase in the overall budget from what was expended in FY 96. Rather, these items represent a re-directing of project efforts to build upon past successes and respond to current needs. Collectively the proposed changes will significantly enhance StreamNet's ability to provide fish and wildlife data services and otherwise respond to Fish and Wildlife Program imperatives.

White Papers and the Project Record. In comparison to FY 96, the FY 97 work plan includes more tasks that involve the preparation of scoping or strategy reports. This increased attention to scoping and strategy reports is necessitated by 1) changing and expanding demands within the region for fish and wildlife data, 2) advancements in data management and delivery technology, and 3) the desire among project participants to make sound decisions regarding expenditure of funds and to provide documentation for these decisions. These reports - or white papers - are considered to be internal working documents that, due to their subject matter and volume, are not appropriate for wide circulation or formal review.

The procedure for preparing and reviewing project white papers will be as follows:

First, white papers will be produced according to the schedule defined in the work plan. Assignments for preparing these reports will be made by the project manager in consultation with the Steering Committee. They will range in length from a single page to several. To the extent possible papers will follow a common format with the most important component being a recommended course of action.

Next, draft white papers will be distributed to the Steering Committee and BPA's COTR for review and comment. Particularly important or complex issues will be discussed at Steering Committee meetings, others may be handled in a less formal manner. Steering Committee members and the COTR may, at their discretion, solicit additional review from others in their respective organizations. All draft products will also be made available to the public upon request. Depending on the issue, the Steering Committee may also wish to solicit comments from the Council, the agencies and tribes, or others.

Next, draft white papers will be revised and made final according to the timetable in the work statement. Typically this will be within one month of release of the draft. Again, final white papers will be distributed to the Steering Committee and COTR. Whenever possible draft and final white papers will be transmitted electronically.

Finally, in accordance with Task 6.9, all final white papers will be assembled into a "project record" that will be presented as a formal project deliverable, and made available to the public over the Internet. The project record provides both a convenient means for compiling white papers and an efficient way to allow for more formal review by BPA, the Council, and others wishing to do so. Upon completion, appropriate recommendations from the project report will be integrated into the project's strategic plan, data plan, and/or next year's work plan.

Work plan tasks that involve production of white papers are as follows:

Task 1.2(d): Procedures for compilation of resident fish hatchery production data (January 31).

Task 1.3(a): Draft (January 31) and final (February 28) strategy for interagency collection/compilation of stream habitat data.

Task 1.3(f): Draft (June 30) and final (July 31) strategies for estuary habitat.

Task 1.3(g): Draft (June 30) and final (July 31) strategies for watershed/aquatic health.

Task 1.4(c and d): Draft (January 31) and final (February 28) strategy and proposed data contents for diversions and fish passage facilities data.

Task 1.4(e): Draft (March 31) and final (April 30) NWHS recommendation.

Task 1.10: Draft (November 15) and final (December 15) recommendation for incorporating “in-season” data on dam operations, hydrology, water quality, and fisheries into StreamNet.

Task 2.1: Recommendation on integrating StreamNet formats into Fish and Wildlife Program projects (January 31).

Task 2.4: Draft (November 30) and final (January 31) strategy for future handling of data on the Council VAX.

Task 3.2: A strategy for providing access to library materials via Internet (December 31).

Task 4.1: Recommended course of action concerning use of the national 100K River Reach File product (due within one month of release of the national product).

Task 4.5: Draft (November 30) and final (January 31) recommended procedure for long-term maintenance of the 1:100,000-scale river reach system.

Task 4.8: Draft (November 30) and final (January 31) protocol for linking data collected at other scales to the 1:100,000-scale river reach system.

Task 5.1: Draft recommendation on a fee for services policy (June 30).

Task 6.5: Identify mechanisms for StreamNet to maintain and provide information that is critical to the Council’s Fish and Wildlife Program and regional Endangered Species Act programs (due dates not defined) .

- StreamNet FY 1997 Work Plan -

Overall FY 97 Goal: Provide the Fish and Wildlife Program, regional Endangered Species Act activities, and related regional and state programs with essential information on the region's fish, wildlife, and related aquatic resources for use in policy, planning, and management.

Objective 1 - Data Development: Increase the knowledge base concerning the region's fish and wildlife resources through the acquisition of new, high priority information, and the update and enhancement of existing information.

The geographic scope for data development will be the four state region, with the Columbia River Basin being the first priority. Data related to other geographic areas, including Alaska, California, or British Columbia, may be incorporated if this does not add to the overall cost and produces information that directly supports Fish and Wildlife Program activities.

The data elements described in Tasks 1.1 through 1.10 represent the range of resource data to be compiled in FY 1997. Within this range, the various project participants will identify specific data elements to be compiled, based on the availability of data and priorities. Specifics regarding data development responsibilities of each participating agency will be detailed in individual subcontracts and will be reflected in the project's data plan as described in Task 2.9. Data will be compiled and delivered to the Regional Data Manager using pre-defined regional data exchange standards. Data associated with a given site, stream, or watershed will be linked to the 1:100,000-scale river reach system.

ANADROMOUS FISH

- Task 1.1 Prepare and maintain standardized data on anadromous salmonids and, where indicated, other anadromous fish, to include:
- a) Ocean range and distribution.
 - b) Freshwater distribution, use, and barriers (for native salmonids where this has not previously been completed, Pacific lamprey, white sturgeon, and - where information is available - other significant anadromous species).
 - c) Adult abundance (escapement, redd counts, trap counts, dam counts).
 - d) Juvenile abundance (smolt monitoring, index of abundance, hatchery/wild ratio).
 - e) Harvest (ocean, in-river, terminal).
 - f) Natural production (survival, production factors, spawner recruit numbers).

- g) Hatchery production (Data elements include release numbers, exploitation, maturation and return rates. The Integrated Hatchery Operations Team (IHOT) and affected agencies and tribes will be consulted in defining additional refinements).
- h) Age (composition at return).
- i) Genetic origin, production type, stock and population identification (emphasis during FY 97 will be on compilation of existing information - for example, WDFW Salmon and Steelhead Stock Identification (SASSI) data and NMFS evolutionary significant units (ESUs) - and the identification of regionally consistent exchange formats for future data collection).
- j) Historic and potential range (areas previously used for spawning/rearing).
- k) Spawner recruit data prepared through the regional Process for Analyzing and Testing Hypotheses (PATH) project. (Other PATH data may also be incorporated. Decisions on this will be made in consultation with the PATH and StreamNet steering committees.)

Products: Regionally consistent data sets for salmon and steelhead gathered and forwarded to PSMFC in exchange format (delivered as completed, with July 31 as deadline) and incorporated (September 30).

RESIDENT FISH AND OTHER AQUATIC SPECIES

Task 1.2 Prepare and maintain standardized data on resident fish and other aquatic species, to include:

- a) Distribution and, when known, use for native salmonids - including cutthroat subspecies, bull trout, and rainbow - where not previously completed.
- b) Distribution for sensitive fish and other aquatic vertebrate and invertebrate species, including listed and candidate federal endangered species and listed and candidate state program species.
- c) Distribution for key competitor/predator species - examples include squawfish, walleye, non-native salmonids.
- d) Hatchery production (emphasis on salmonid releases and outplants; data on other species may be included as available. The initial phase will involve a scoping process that will determine the quality and availability of existing data. Realistic deliverables will be determined following this scoping process.)
- e) Natural production (survival, production factors, spawner recruit numbers).

- b) Incorporate historic anadromous data from the McIntosh project (Fish and Wildlife Program project #89-104). (Links to Task 1.1(j).)
- c) Identify existing GIS layers depicting factors that influence spawning habitat for native salmonids, including land use, forest roads, land ownership; acquire or otherwise ensure access to high priority data.
- d) Identify available GAP and National Wetlands Inventory products for states within the region. Acquire and incorporate applicable portions of these data sets into StreamNet.
- e) Incorporate applicable USFS and BLM eastside (and westside) assessment datasets; in consultation with the USFS and BLM determine the long-term role of StreamNet in maintaining these datasets.
- f) Incorporate locations of critical habitats for fish and aquatic wildlife proposed or listed in accordance with the Endangered Species Act.
- g) Prepare a strategy for future compilation of estuary and ocean habitat datasets.
- h) Prepare a strategy for future preparation of a watershed/aquatic health dataset and for rating habitat.

Products: 1) Draft (January 31) and final (February 28) strategy for interagency collection/compilation of stream habitat data.

- 2) GIS layers identified and appropriate layers incorporated into StreamNet (September 30).
- 3) Draft (June 30) and final (July 31) strategies for estuary habitat and watershed/aquatic health.

FACILITIES

- Task 1.4 Prepare and maintain standardized data relating to facilities affecting fish and aquatic habitat.
- a) Integrate data on existing dams from the Pacific Northwest Hydropower Data Base and Analysis System (NWHS) and the National Inventory of Dams into one consistent dataset that includes data on location and identification, physical and hydrological characteristics, licensing status, and other features that have a bearing on the management of fish and wildlife. StreamNet will receive assistance from BPA's NWHS contractor in completing this task.
 - b) Develop a strategy for adding data on irrigation diversions that might impact fish, including diversion location and character, screening status, and, if feasible, water allocation. Initiate compilation of relevant data that is readily available from other sources (e.g., state water resource agencies, model watershed projects). StreamNet will receive assistance from BPA's NWHS contractor in completing this task.
 - c) Develop a strategy for adding data on man-made blockages and fish passage facilities, including location, character, and status. Initiate compilation of relevant data that is readily available from other sources. (Links to Task 1.1(b).)
 - d) Develop and maintain a dataset on anadromous and resident hatchery facilities containing information on facility location, design, management, authorization, etc.
 - e) Prepare a recommendation regarding integrating the NWHS into StreamNet by FY 98.

- Products:
- 1) Draft (January 31) and final (February 28) strategy and proposed data contents for diversions and fish passage facilities data.
 - 2) Dams dataset (September 30).
 - 3) Draft (March 31) and final (April 30) NWHS recommendation.

WILDLIFE AND NATURAL HERITAGE DATA

- Task 1.5 Secure an annual update of natural heritage program data within the states of Idaho, Montana, Oregon, and Washington. Provide BPA with a electronic data file and, the most current data dictionaries/handbooks.

Product: Electronic data to BPA (June 30).

Task 1.6 Drawing from state heritage data bases or other available sources, prepare and maintain standardized point and polygon data on sensitive riparian-based vertebrate species (as defined by state and federal fish and wildlife agencies).

Products: Data compiled from participating organizations (July 31) and incorporated into StreamNet (September 30).

FISH AND WILDLIFE MANAGEMENT AND ENHANCEMENT PROJECTS

Task 1.7 Prepare and maintain standardized data relating to fish and aquatic management, to include:

- a) In consultation with BPA, and using data compiled by BPA, maintain and make available standardized data that tracks fish and wildlife enhancement projects funded through the Fish and Wildlife Program.
- b) Locate and prepare summary data on other habitat restoration, protection, and mitigation projects.
- c) Identify the location of Fish and Wildlife Program funded and other applicable watershed planning efforts.
- d) In consultation with the Council, devise a strategy for maintaining applicable data from subbasin planning, model watersheds, and other Fish and Wildlife Program funded watershed initiatives.
- e) Prepare a 1:100,000-scale dataset on federal wild and scenic rivers and state equivalents.

Products: Data compiled (July 31) and incorporated into StreamNet data base (September 30).

DATA REFERENCE

Task 1.8 Document data incorporated into StreamNet with reference number and source; collect applicable source documents and provide same to the StreamNet Library.

- Products:
- 1) References and sources in electronic format (July 31) and integrated into system (Sept. 30).
 - 2) Documents in physical possession at StreamNet Library (Sept. 30).

RIVER SYSTEM OPERATIONS

Task 1.9 Compile available historic data on mainstem hydro and storage dam operations including spill flow, turbine flow, screening and FGE, temperature, juvenile transport, and dissolved gases (including integration of data prepared through Fish and Wildlife Program project # 93-008, "Allowable Gas Supersaturation at Dams").

Product: Data incorporated into StreamNet (August 31).

Task 1.10 Prepare a recommended approach for incorporating available in-season fishery, hydrologic, water quality, and dam operations data into StreamNet. The approach will focus on the immediate issue of providing Internet data services during the 1997 migration season and will build upon related products prepared by Battelle's Pacific Northwest Labs (PNL) and the University of Washington Center for Quantitative Sciences (UW). Steps will include:

- a) Consult with UW and PNL and review related products prepared by these entities.
- b) Consult with the Fish Passage Center, the Army Corps of Engineers, the Technical Management Team, and others having direct involvement with development and/or use of these data.
- c) Identify technical considerations concerning transmittal of data from appropriate sources to StreamNet.
- d) Identify technical considerations concerning providing access to these data via StreamNet's Internet capability.
- e) Identify specific data to be included in FY 97.
- f) Prepare necessary data exchange standards and formats.
- g) Identify programming needs.
- h) Identify procedures and protocol for transmitting data from appropriate sources.
- i) Prepare a recommended procedure for development of a long-term plan for in-season data transmittal and user access.

Product: Draft (November 30) and final (December 31) recommended approach for incorporating 1997 migration season fishery, hydrologic, water quality, and dam operations data into StreamNet.

Objective 2 - Data Management: Provide high quality data management services, with specific emphasis on the creation of regionally consistent data sets.

Task 2.1 Design, develop, and maintain standard codes and data exchange formats for data being compiled as part of the StreamNet project. At the regional level, provide technical assistance regarding standard codes and exchange formats for Fish and Wildlife Program and ESA-related projects, and for applicable tribal data compilation activities. At the state level provide similar technical assistance for state agency data activities applicable to StreamNet. The extent of this technical assistance will be determined by data manager work loads. Prepare a recommendation regarding integration of StreamNet data exchange formats into Fish and Wildlife Program contract terms and conditions.

Products: 1) Proposed and adopted data exchange formats for specific data items (to be completed prior to commencement of data compilation activities).
2) Recommendation on integrating StreamNet formats into Fish and Wildlife Program projects (January 31).

Task 2.2 Update the existing data exchange format report.

Products: Data exchange format report containing formats for data types that are either components of StreamNet or in the process of being incorporated (ongoing, with a final product produced by September 30).

Task 2.3 At both the regional and state levels, provide database management and administration necessary for accomplishing StreamNet objectives, to include: 1) maintaining regional and state-level StreamNet tabular and graphic data sets, 2) processing exchange data into the regional database, transporting data to SQL environment, 3) enhancing StreamNet database structures and capabilities, and at the regional level, provide programming services to project participants to allow for efficient data entry and transfer.

Products: Summary of services (in quarterly status and annual reports).

Task 2.4 Evaluate Fish and Wildlife Program data currently stored on the Council's VAX computer and, in consultation with the Council and BPA, determine data sets to be stored, maintained, and/or enhanced. Port applicable files to StreamNet. The evaluation will specifically consider data related to: 1) the Hydro Assessment Study, 2) Subbasin Planning and 3) Protected Areas.

Products: 1) Draft (November 30) and final (January 31) strategy for future handling of data currently on the Council's VAX.
2) Applicable data transferred to StreamNet and/or archived (April 30).

- Task 2.5 Establish a protocol for compilation of a regional catalog of spatial data and, following these protocol, compile a regional/state catalog of applicable and available data.
- Products: Initial catalog report (December 31), updated quarterly thereafter.
- Task 2.6 Establish and implement procedures for coordination of GIS activities among participating organizations.
- Products: Brief report identifying procedures (by January 31).
- Task 2.7 Establish procedures for managing non-standardized datasets having significance to the Fish and Wildlife Program and/or Endangered Species Act activities related to aquatic species.
- Products: Management procedures (February 28).
- Task 2.8 Store and make available current and select historical version of each state's River Information System (RIS). (All four states have historical versions of their RIS. At a minimum, the 1986 version must be retained. Other historical versions to be retained will be determined by state fish and wildlife agencies. Current RIS contents vary by state. The long-term intent is to merge applicable RIS data sets into StreamNet.)
- Product: Selected historic datasets made available at the regional level (September 30).
- Task 2.9 Prepare and maintain a project data plan that identifies 1) current data holdings at the regional level, 2) data items to be incorporated in the current contract period and in future years, and 3) expectations for data development and delivery from participating organizations within the current contract period.
- Product: Data plan updates (quarterly). The initial list of expectations for data development and delivery from participating organizations will be completed and provided to BPA by October 31 for incorporation into this work plan.

Objective 3 - Library / Reference Services: Provide high quality library services targeted to meeting the needs of the region's decision-makers, planners, managers, and the public in the areas of fish, wildlife, and aquatic habitat. This includes continuing to acquire and catalog relevant research reports and other documents and providing open and efficient access to these materials.

Task 3.1 Continue to develop a collection of materials applicable to the mission of StreamNet. These include:

- a) Documents used as source materials for data compiled in Objective 1.
- b) Documents published by BPA under the Fish and Wildlife Program.
- c) Documents from the Council's Fish and Wildlife Program-related collection.
- d) Documents related to NMFS ESA activities, including source documents and a copy of applicable ESA administrative records.
- e) Additional books, journals, agency reports, gray literature, research reports, and documents that are applicable to management of the region's aquatic resources.

Products: A collection of relevant materials, with collection efforts summarized in quarterly and final reports.

Task 3.2 Provide improved user access to the materials described in Task 3.1, including:

- a) Provide an appropriate facility for the storage and use of the physical collection.
- b) Organize and maintain the collection for appropriate on-site use.
- c) Catalog the materials acquired by the StreamNet Library.
- d) Develop a strategy for providing access to the StreamNet Library Catalog via Internet, including an analysis of providing access to electronically-stored documents.
- e) Develop a plan for the construction of a useful keyword thesaurus/subject heading list.

Products:

- 1) An organization system conducive to locating materials (Dec. 31).
- 2) A strategy for providing access to library materials via Internet (December 31).
- 3) An outline of the structure and guidelines for a keyword thesaurus and/or local subject headings to be used for cataloging (March 31).
- 4) A facility that is conducive to collection access and use (March 31).

- Task 3.3 Catalog, index, and abstract materials acquired in Task 3.1a; catalog and index materials acquired in Task 3.1b; catalog materials acquired in Task 3.1c.
- Products: 1) Dataset uploaded to StreamNet (quarterly).
 2) MARC data for uploading into StreamNet (quarterly once catalog decision has been implemented).
- Task 3.4 Manage the StreamNet Library and provide library services to the StreamNet user community. Services will include reference and referral, document delivery, inter-library lending and borrowing, and on-line search services. (Some of these services may be limited by staff or legal constraints. Fees may be required for public use of some services, according to predefined and Steering Committee approved criteria.)
- Products: 1) Summary of activities (in quarterly and final status reports).
 2) Revised versions of the library access guide which includes descriptions of services and, when applicable, fees (updated as needed).
- Task 3.5 Engage in networking activities with other agency and regional library service providers in the following ways:
- a) Collect information about other regional fish and wildlife library collections and access policies.
 - b) Provide consultations for agencies and groups on ways to coordinate catalogs and services.
 - c) Coordinate with users, agencies, and regional libraries to improve services and avoid unnecessary duplication.
 - d) Facilitate communications between agency library service providers.
- Products: 1) File of information on agency fish and wildlife library collections and services (ongoing, completed by September 30).
 2) Summary of activities in quarterly and final reports
 3) E-mail discussion group between participating agency library staff (established by December 31).

Objective 4 - River Reach System / Hydrologic Referencing: Create and maintain the means to link StreamNet data to hydrologic units, streams, and specific locations and to analyze and display this information using database and geographic information system technologies. Work on the 1:100,000-scale river reach system will be undertaken in collaboration with the USGS/EPA development of the National Hydrographic Dataset and will meet national standards.

Task 4.1 Monitor progress of the National Hydrographic Dataset; provide comments and technical assistance as necessary. Evaluate the final product to determine if this product is appropriate for StreamNet uses. If so, integrate the Pacific Northwest 100K reach system with the national product.

Products: 1) Recommended course of action concerning use of the national product (due within one month of release of the national product).
2) Integration of national product and existing Pacific Northwest 100K system - if compatible with the recommendation (within 3 months of release of national product).

Task 4.2 Review the National Hydrographic Dataset product in terms of its treatment of lakes and reservoirs. As necessary, establish graphic links and provide regionally consistent unique numbers for each water body. Prepare a recommendation regarding if and how high mountain lakes should be integrated into the system.

Products: 1) Lakes and reservoirs in system (within 3 months of release of national product).
2) High lakes recommendation (by July 31).

Task 4.3 Complete a “visual pass” and make corrections to the National Hydrographic Dataset product. Note: Funding for staff to complete this task will come from the EPA, not from the BPA Fish and Wildlife Program contract.

Product: Corrected graphic files (four months after receipt of uncorrected files).

Task 4.4 Complete routing using regionally consistent protocol and establish a unique stream ID for each stream in the StreamNet hydrologic referencing system. Steps include:

- a) Establish regionally consistent protocol and procedures.
- b) Aggregate route and ID coverages into one library.
- c) Complete routing for named streams and assign unique stream ID.
- d) In accordance with protocol, assign names to unnamed streams, create routes, and add unique stream ID. (Protocol will establish the type and extent of unnamed streams to be included).

Products: Draft protocol (November 30). Routing and naming complete (February 28), integrated into regional system (April 30).

Task 4.5 Establish a recommended procedure for long-term maintenance of the 100K river reach system, either through StreamNet or some other means.

Products: Draft (November 30) and final (January 31) recommendation.

Task 4.6 Maintain the 100K river reach system, including making corrections, consistent with the recommendation in Task 4.5.

Products: 1) Error corrections (submitted quarterly).
2) Brief report describing maintenance protocols (June 30).

Task 4.7 Acquire computerized coverages that provide a means for referencing StreamNet data to hydrologic units (USGS cataloging units, Council subregions, USFS sub-hucs, etc.) and geographic referencing systems (ecological provinces, etc.). Provide necessary links to StreamNet data.

Products: 1) List of applicable coverages (November 30).
2) Acquisition of applicable coverages (March 31).

Task 4.8 Establish protocol for linking data collected at other scales to the 1:100,000-scale system.

Products: Draft (November 30) and final (January 31) protocol.

Objective 5 - Data Delivery / Information Systems: Provide StreamNet data to users in formats that meets their policy, planning, and management needs.

Task 5.1 Receive and respond to requests for data, source materials, and custom products, including providing BPA with electronic updates of StreamNet data and documentation as requested. Response to requests will be honored within the limits of available resources. Priority will be given to information requests having direct relevance to 1) the Fish and Wildlife Program, 2) implementation of the Endangered Species Act, and 3) natural resource management activities.

Products: Services summarized in quarterly and final status reports. Draft recommendation on a fee for services policy (June 30).

Task 5.2 Maintain and distribute the existing windows-based distributed system (DS) as needed. Maintenance will include 1) adding new data and references to existing data categories and 2) correcting software problems. New data categories may also be added if this can be accomplished with limited new programming effort and is approved by the Steering Committee and BPA. As necessary, update code and data documentation. Provide the capability to download the DS via the Internet and, when this is not feasible, via disk, CD, or other high density data storage products, depending on which is most effective at providing desired services at reasonable cost. The need for implementation of this task depends on the progress made in developing the Streamnet home page and user acceptance of that product. The Steering Committee and BPA will be consulted prior to work being undertaken on this task to determine if implementation is warranted.

Products: 1) DS beta release (March 31) and final version (May 31).
2) Draft (June 30) and final (August 31) revisions to documentation.

Task 5.3 Continue to develop, test, and document a functional client-server system to provide platform independent access to StreamNet data products through the world-wide-web (WWW) service of the Internet. Development will proceed collaboratively with BPA and participating organizations. Specific components of the development effort will include: 1) a Structured Query Language (SQL) data engine to host attribute data sets, 2) on-line linkage between the SQL host and the StreamNet geographic information system, and 3) a Hyper Text Markup Language (HTML) based WWW user interface.

Work will proceed in accordance with the StreamNet-produced report "Technical Applications Development and Implementation Plan to Provide Independent Access to StreamNet Data Products Through the World Wide Web Service of the Internet" dated 7/2/96 (as modified by correspondence dated 7/10, 7/17, and 7/26, and any future bilateral changes or contract modifications) and incorporated herein by reference.

- Products:
- 1) Draft (January 31) and final (February 28) phases I and II status report.
 - 2) Draft (April 30) and final (May 31) report describing findings for phases I and II and recommending a preferred alternative for development of spatial data query tools.
 - 3) Hardware and software necessary for system development procured, installed, and configured (June 30).
 - 4) Functional Internet-based data access system for all StreamNet data with documentation (September 30).

Task 5.4 Maintain and enhance other components of the StreamNet home page. Possibilities include but are not limited to educational materials, visual materials, links to related projects and activities, a project news function, information concerning project administration, and project participant communications.

- Products:
- 1) Draft (November 30) and final (December 31) enhancement strategy.
 - 2) Enhancements described in quarterly and final status reports.

Task 5.5 Provide training and orientation for users of the StreamNet data delivery systems upon request.

Products: Activities described in quarterly and final reports.

Task 5.6 Prepare an annual salmon and steelhead report for the Columbia Basin as identified in the Fish and Wildlife Program.

Products Draft (March 31) and final (May 30) Report on the Status of Salmon and Steelhead in the Columbia River Basin.

Task 5.7 Prepare map products (e.g., map atlases) in hardcopy and/or electronic format that depict the distribution and (potentially) other features associated with anadromous and resident salmonids.

Products: Map products for three to six species (May 30), with other activities described in quarterly and final reports.

Task 5.8 With Steering Committee concurrence, prepare topical reports that describe content, methods used, and sources of select large datasets compiled and incorporated into StreamNet databases (e.g., a spawner-recruitment report).

Products: Draft (July 31) and final (September 30) reports on at least one data type.

Objective 6 - Project Management / Coordination: Provide effective leadership that ensures the production of high quality products targeted at critical applications and the development of these products in a timely, cost-effective manner.

Task 6.1 Organize, facilitate, and/or participate in essential coordination meetings involving 1) the steering committee, 2) BPA, 3) staff and management of participating organizations, and 4) Fish and Wildlife Program and ESA officials. (Products described below constitute minimum requirements).

Products:

- 1) Four steering committee meetings, with minutes.
- 2) One on-site coordination meeting with each participating organization (by May 30).
- 3) Two coordination meetings with each of the Council and NMFS (by December 31 and June 30).
- 4) One briefing/coordination meeting with BPA fish and wildlife staff (by November 30). Additional meetings with BPA personnel as requested.

Task 6.2 Prepare project administration reports including:

- a) Quarterly reports that describe progress being made toward meeting work plan deliverables and summarizes the use being made of the project home page, library, and custom services. Quarterly reports will be suitable for posting on a Steering Committee home page on the WWW.
- b) A final report that describes project accomplishments.

Products:

- 1) Quarterly reports (January 31, April 30, July 31, October 31).
- 2) Final report (November 30).

Task 6.3 Produce public information materials including updated versions of the project brochure, computer demonstration materials, a paper summarizing the project suitable for use at conferences, and other applicable materials. Revision of existing materials will be on an as needed basis, as determined by the project manager and steering committee in consultation with BPA.

Products:

- 1) Revised brochure (November 30).
- 2) Draft (December 15) and final (January 31) computer demonstration.
- 3) Draft (February 28) and final (April 30) summary paper.

Task 6.4 Develop and maintain a communication link among StreamNet participants regarding participation in state, regional, and national educational and professional conferences. With concurrence from the Steering Committee, participate in, and as appropriate, make presentations or participate in poster sessions at suitable conferences.

Products: Attendance and presentation by project participants at four state-level conferences (one per state), one regional conference, and one additional state, regional, or national conference (by September 30).

Task 6.5 In conjunction with Fish and Wildlife Program and regional Endangered Species Act officials, identify mechanisms for StreamNet to maintain and provide information that is critical to these programs.

Products: When applicable, reports summarizing proposed actions.

Task 6.6 Maintain communications between StreamNet and other applicable regional and state-level fish and wildlife activities in order to identify means for collaborative data collection, storage, and dissemination. Collaborative data activities will specifically target 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 agencies. Collaboration with coast-wide and private data collection/compilation efforts will be pursued when this supports overall project goals.

Products: Summary of activities in quarterly and final reports and, if applicable, narratives summarizing interagency agreements.

Task 6.7 Participate in Fish and Wildlife Program advisory groups and other applicable regional and/or state forums.

Products: Activities summarized in quarterly and final reports.

Task 6.8 Update the StreamNet strategic plan based on evaluations of 1) the extent to which current data needs are being met, 2) emerging needs for data and StreamNet's capacity to meet these needs, and 3) legal, administrative, social, and biological trends that might influence future StreamNet activities. User surveys, focus groups, or other outreach techniques may be employed, as deemed appropriate.

Products: Draft (June 30) and final (August 31) revised strategic plan.

Task 6.9 Compile a project record consisting of final versions of all white papers and other significant written materials that are prepared during the contract period. Distribute this to BPA, the Council, and members of the Steering Committee for review and revise accordingly.

Products: Draft (June 30) and final (July 31) project record.

Task 6.10 In collaboration with BPA, prepare a proposed work plan and budget for FY 1998.

Products: Draft (June 30) and final (July 31) proposed work statement and budget.

Staff Time Allocations

Estimated Time Allocations by Objective / Person Months for FY 1997 StreamNet Activities.

(Note: These are approximations for planning purposes and are subject to change.) TBA refers to positions where a specific individual has not yet been identified.

Name	Obj. 1 (Data Dev)	Obj. 2 (Data Mgmt)	Obj. 3 (Library)	Obj.4 (RRF/Hyd)	Obj. 5 (Data Deliv)	Obj. 6 (Mgt/Coor)	Total Months
CRITEC							
Phil Roger	0.30		0.15			2.80	3.25
Gretta Siegel		0.40	6.80			0.80	8.0
Asst. Librarian (TBA)		0.40	7.20			0.40	8.0
Krista Schauer			12.00				12.0
Library Tech (TBA)			6.00				6.0
Biologist (TBA)	2.55			0.15	0.30		3.0
Nez Perce Tribal Biologist	6.00						6.0
Umatilla Tribal Biologist	6.00						6.0
Warm Springs Tribal Bio.	6.00						6.0
Yakima Tribal Biologist	6.00						6.0
IDFG							
Jerome Hansen	2.00					2.00	4.0
Doug Reece					12.00		12.0
Bart Butterfield	4.00			4.00	2.00		10.0
Daniel King	3.00	3.00			6.00		12.0
Terry Elms-Cockrum	5.00	1.00			2.00		8.0
Evan Brown	5.00	1.00			2.00		8.0
Lawrence Hartpence	3.00			6.00	3.00		12.0
Rec/Data Entry Clerk	5.00						5.0
Data Coord (CDC)	1.50						1.5
MDFWP							
Janet Decker-Hess	2.75	0.90		0.45	0.90	4.00	9.0
Jeff Hutten	2.10	2.10		1.70	2.60		8.5
Lydia Bailey	4.80	1.20					6.0
Angie Schmidt	7.20	1.20		1.80	1.80		12.0
Lisa Darlington	8.40			1.80	1.80		12.0
Sharon Sarver						1.20	1.2
ODFW							
Ray Beamesderfer	1.80		0.60		3.00	0.60	6.0
Brent Forsberg	5.40			0.60	6.00		12.0
FWB3 - TBA	7.80				3.00	1.20	12.0
Eric Tinus	4.50				1.50		6.0
Keith Hupperts	8.40			2.40	1.20		12.0
Gloria Bourne	9.60		1.20		1.20		12.0
Clerical					1.50	1.50	3.0

Name	Obj. 1 (Data Dev)	Obj. 2 (Data Mgmt)	Obj. 3 (Library)	Obj.4 (RRF/Hyd)	Obj. 5 (Data Deliv)	Obj. 6 (Mgt/Coor)	Total Months
PSMFC							
Stan Allen	0.15	0.15	0.15	0.15	0.15	2.25	3.0
Drew Parkin	3.60		0.60	0.60	0.60	6.60	12.0
Duane Anderson	2.40	2.00	0.40	0.80	1.60	0.80	8.0
GIS Data Anal - TBA	3.60	3.00		1.80	2.40	1.20	12.0
Liza Bauman	0.20				0.80	1.00	2.0
SHO-BANS							
Doug Taki	0.45				0.30	2.25	3.0
USFWS							
Steve Pastor	1.20				0.30	1.50	3.0
WDFW							
Dick O'Connor		0.20			0.20	1.60	2.0
Larry Brown	2.40	8.40			1.20		12.0
Leslie Sikora	6.30	0.90			1.80		9.0
Brodie Cox	10.20	0.60			1.20		12.0
Bob Woodard	7.20	1.20			3.60		12.0
Martin Hudson	1.80	0.90		5.40	0.45	0.45	9.0
Cindy Burns	4.80			4.80	2.40		12.0
Dao Tran	9.60				2.40		12.0
TOTALS:	172.00	28.55	35.10	32.45	71.20	32.15	371.45
	(46%)	(8%)	(9%)	(9%)	(19%)	(9%)	