Bonneville Power Administration
Fish and Wildlife Program FY99 Proposal Form

How this form is structured

There are ten major sections to this form. Sections 1 through 5 are database-style fields in which specific information is being sought, so your input is restricted to the gray boxes below. *The boxes are pointers to indicate where to type; they will grow as you type more text, and they won't print as gray boxes.* These sections include: General Administrative Information; Key Words; Objectives, Tasks and Schedules; Relationship to Other Bonneville Projects; and Budget.

In Sections 1 through 5, each field is briefly described on the form itself, and for some fields more tips are shown in the status bar (bottom of the screen). For tables where more rows may be needed than are provided, press Alt-R from within the table to add a row at the end.

Sections 6 through 10 accept a narrative format in which more open-ended questions are asked and you may respond at length in paragraph form. Descriptions are provided on the form. These sections include: Abstract, Description, Relationships to Other Projects, Personnel, Information/Technology Transfer.

Steps to complete the form

1. First, read the Guidelines to Proposals.
2. Second, save this form. For ongoing projects, use your project number.DOC (example: 8909900.DOC). For new proposals, use a filename other than BLANK.DOC, preferrably, your agency acronym and your initials (example: NMFSWS1.DOC).
3. Press Tab to move to the first field (Title of Project), and start typing.
   NOTE: When you exit the Project Title or Project Number fields, your screen may display a "Header" box briefly. The form is updating itself, and will continue normally.
4. Fill in all fields (gray boxes) pressing Tab to advance from one field to the next. Then fill in narrative input areas, pressing down arrow to advance.
5. Print the completed document.
6. Save the document to diskette and mail both paper and diskette to:

   Bonneville Power Administration - EW
   ATTN: Connie Little
   FY99 Proposals
   P.O. Box 3621
   Portland OR 97208-3621

Section 1. General administrative information

Title of project. 75 characters or less; do not include the contractor name or acronym; use abbreviations if appropriate; start with action verbs, i.e., "Evaluate Coho...", not "Evaluation of Coho".

Streamnet: The Northwest Aquatic Information Network

Bonneville project number, if an ongoing project 8810804

Business name of agency, institution or organization requesting funding
Pacific States Marine Fisheries Commission

Business acronym (if appropriate) PSMFC

Proposal contact person or principal investigator:

Name	Drew O. Parkin
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Subcontractors. List other agencies or entities that will receive funding under this project, either through sub-contracts managed by the project sponsor or, where multiple agencies are involved as joint sponsors, through primary contracts managed by Bonneville. If another entity will be responsible for the long term maintenance of the project, identify them here.

List one subcontractor per row; to add more rows, press Alt-R from within this table

Organization	Mailing Address	City, ST Zip	Contact Name
Columbia River Inter-Tribal Fish Commission	729 N.E. Oregon, Suite 200	Portland, OR 97232	Phil Roger
Idaho Department of	600 S. Walnut,	Boise, ID 83707	Jerome Hansen

Wildlife Service		98665	
Washington Department of Fish and Wildlife	600 Capitol Way, N.	Olympia, WA 98501-1091	Dick O'Connor
Yakama Indian Nation	PO Box 151	Toppenish, WA 98948	Lynn Hatcher
Nez Perce Tribe	PO Box 305	Lapwai, ID 83540	Silas Whitman
Confederated Tribes of the Umatilla Indian Reservation	PO Box 638	Pendleton, OR 97801	Gary James
Confederated Tribes of the Warm Springs Reservation	PO Box C	Warm Springs, OR 97761	Patty O'Toole

NPPC Program Measure Number(s) which this project addresses. Refer to 1994 Fish and Wildlife Program as amended in 1995; NPPC staff will proof this field and correct if necessary; separate multiple measure numbers with commas.
Primary: Sections 3.2 and 3.3 as follows: 3.2A.1, 3.2A.2, 3.2B.1, 3.2F.1, 3.2G.2, 3.3A.1, 3.3A.2, 3.3B.1, 3.3C.1, 3.3D.1, 3.3E.1
Additional: 2.2A, 2.2D, 4.3C.1, 5.0F.15, 7.0C.2, 7.1C1, 7.1C2, 7.1C3, 7.6D, 8.1, 8.5E.1, 10.8B, 10.8C, 12.2

NMFS Biological Opinion Number(s) which this project addresses. If the project relates to the Kootenai Sturgeon Biological Opinion, the NMFS Hydrosystem Operations Biological Opinion, or other Endangered Species Act requirements, enter the Action Number and Biological Opinion Title.
State of Oregon's Oregon Plan (Coho and Steelhead)
State of Idaho's Bull Trout Plan

Other planning document references. If the project is called for in the National Marine Fisheries Service *Snake River Salmon Recovery Plan*, or in *Wy Kan Ush Me Wa Kush Wit*, the Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs and Yakama tribes, in U.S. Forest Service or Bureau of Reclamation land management plans, or in local area subbasin or watershed plans, or in other planning documents, provide the name of the plan and reference citation where the need is identified.

If the project type is "Watershed" (see Section 2), reference any demonstrable

Wy Kan Ush Me Wa Kush Wit: pages 5A-4, 5B-5, 5D-1, 5d-2, 5D-3 (StreamNet will also provide data that supports vol. 2 subbasin plans)

CBFWA Annual Implementation Work Plan, Appendix A, June 1997: 2.2.3, 2.4.3, 2.5.1.4, 2.7.1, 2.7.2

ISRP Report to NWPPC, July 1997: III.A.1, III.A.4, III.B.7, III.B.13, III.B.14, III.B.15, III.B.20

NWPPC Annual Implementation Work Plan, September 1997: 2 (pages 10-12), 4.b, 9.a, 9.b

CBFWA Multi-Year Implementation Work Plan, 1997 review draft: 5.5.1.1, 5.5.2, 5.5.2.1, 5.9.4-1, 5.11.3.1, 6.4.1, 6.4.2, 6.4.3, 6.4.4, 6.4.5, 6.4.6, 6.4.7, 7.4.2, 8.3.1, 8.3.2, 8.3.3

ISG Return to the River (prepublication version): pages 353, 425, 426, 429, 430, 431, 443, 444, 445, 449, 511, 518

USFS and BLM Interior Columbia Basin Environmental Management Plan: Assessment of Ecosystem Components pages 2056, 2057

Subbasin. List subbasin(s) where work is performed. Use commas to separate multiple subbasins. Coordination projects or those not affecting particular subbasins may omit this field.
StreamNet is involved in data development throughout the Columbia Basin. StreamNet data reports are available at the subbasin level for all portions of the Columbia Basin.

Short description. Describe the project in a short phrase (less than 250 characters). Give information that is not in the title. If possible start this field with an action verb (protect, modify, develop, enhance, etc.) rather than a noun (this project protects). There is room for a more detailed project abstract later in the narrative section, so please keep this answer short.
Provide data and data services to the FWP by 1) compiling essential, regionally consistent

the **one** item that most applies to your project, and mark it with an X in the Mark column. If other items in the same heading also apply, mark them with a plus sign or asterisk.

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish		Construction	*	Watershed
*	Resident fish		O & M	*	Biodiversity/genetics
*	Wildlife	*	Production	*	Population dynamics
	Oceans/estuaries	*	Research	X	Ecosystems
	Climate	X	Monitoring/eval.		Flow/survival
	Other	*	Resource mgmt		Fish disease
		*	Planning/admin.		Supplementation
			Enforcement		Wildlife habitat en-
			Acquisitions		hancement/restoration

Other keywords. If there are other key words that would help identify your project, enter them below, separated by commas; example key words: DNA, stock identification, life history, sampling, modeling, nutrient dynamics, predation, hydrodynamics, gas bubble disease, disease names, hatchery-wild interactions, ecological interactions.
adult abundance, aquatic habitat, database, GIS, harvest, hatchery production, hydrographic data, Internet, juvenile abundance, library, life history, natural production, project tracking, river operations, species distribution, population identification

Section 3. Relationships to other Bonneville projects

Describe any interdependencies with other projects funded under the Fish and Wildlife Program. Don't include general relationships to other projects, but target those that depend on this project being funded, or vice versa. There is room in Section 7 below to comment on other relationships or to describe these more fully.

If you need more rows, press Alt-R from within this table.

Project #	Project title/description	Nature of relationship
8812001	Yakima/Klickitat Fisheries Project (and associated projects)	StreamNet will consolidate and provide Internet access to project data
9700400	Resident Fish Stock Status Above	StreamNet will provide technical

		projects would be mutually supportive.

Section 4. Objectives, tasks and schedules

This section has three parts: a) Objectives and tasks table, b) Objective schedules and costs table, c) other schedule fields. Instructions for each part follow the headings.

Objectives and tasks

Briefly describe measurable objectives and the tasks needed to complete each objective. Use Column 1 to assign numbers to objectives (for reference in the next table), and Column 3 to assign letters to tasks. Use Columns 2 and 4 for the descriptive text. Objectives do not need to be listed in any particular order, and need only be listed once, even if there are multiple tasks for a single objective. List only one task per row; if you need more rows, press Alt-R from within this table.

Obj 1,2,3	**Objective**	**Task a,b,c**	**Task**
1	Data Development -	a	Compile anadromous fish data including range, life history, adult abundance, juvenile abundance, harvest, natural production, hatchery production, age/sex composition for returning adults, genetics and populations, and index populations.
		b	Compile resident fish data (as available) including range, life history, adult abundance, harvest, natural production, hatchery production, genetics and populations, and index populations.
		c	Prepare a wildlife mitigation property dataset and incorporate it into an Internet product that presents data, digital maps, and site photos.

		f	Compile data on historic and current Columbia Basin mitigation projects.
		g	Compile historic (not in-season) data on mainstem operations including flow, quality, FGE, juvenile and adult indices.
2	Data Management and Delivery	a	Maintain and update the StreamNet data plan, and data exchange standards.
		b	Maintain and update the StreamNet database.
		c	Maintain and update the StreamNet GIS data system.
		c	Maintain and enhance the StreamNet Internet site.
		e	Maintain and enhance the 100K river reach and hydro unit system.
		f	Serve data requests made by FWP participants.
3	Library and Reference Services	a	Maintain and expand the StreamNet document collection.
		b	Catalog Streamnet source materials and other acquisitions.
		c	Provide professional library services to the FWP community.
4	Services to the Fish and Wildlife Program and Related Restoration Activities	a	Prepare a project database that displays information from the proposed and adopted AIWP.
		b	Provide data and data reports for use in FWP monitoring and evaluation activities.
		c	Provide technical database and GIS services to FWP watershed projects.
		d	Provide technical database and GIS

			projects as specified by NWPPC and CBFWA.
		h	Provide Internet access to project information and data from select FWP projects.
		i	Provide data and data reports for reports and plans as specified by NWPPC and CBFWA.
		j	Maintain the NWPPC protected areas dataset.
5	Project Management	a	Supervise and coordinate project activities.
		b	Coordinate project activities with other FWP and related activities.

Objective schedules and costs

Partition overhead, administrative, support, and any other common costs shared among objectives. The percentages for all objectives should total 100%. Enter just the objective numbers from Column 1 in the above table. Enter start and end dates for each objective using the mm/yyyy format (e.g. 05/2002 for May, 2002).

If you need more rows, press Alt-R. **Press Alt-C to calculate total.**

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	10/1998	9/1999	50.00%
2	10/1998	9/1999	15.00%
3	10/1998	9/1999	15.00%
4	10/1998	9/1999	15.00%
5	10/1998	9/1999	5.00%
			TOTAL 100.00%

Schedule constraints. Identify any constraints that may cause schedule changes. Describe major milestones if necessary.
If a primary data provider is unable to supply data, staff will need to identify other means to secure these data or shift to other data tasks. The breadth of the project ensures that no

Section 5. Budget

This section has two tables: 1) FY99 budget by line item, and 2) Outyear costs. Instructions for each part follow the heading.

FY99 budget by line item

List FY99 budget amounts for each category. If an item needs more explanation, provide it in the Note column. If the project uses PIT tags, include the cost ($2.90/tag). **Press Alt-C to calculate total.**

Item	**Note**	**FY99**
Personnel		$1,079,500
Fringe benefits		$307,500
Supplies, materials, non-expendable property		$218,000
Operations & maintenance		$ 0
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		$ 0
PIT tags	# of tags:	$ 0
Travel		$48,500
Indirect costs		$316,500
Subcontracts		$ 0
Other		
TOTAL		$1,970,000

Outyear costs

List budget amounts for the next four years, and the estimated percentage of those costs for operations and maintenance (O&M).

Outyear costs	**FY2000**	**FY01**	**FY02**	**FY03**
Total budget	$2,007,430	$2,067,653	$2,129,682	$2,193,573
O&M as % of total	0.00%	0.00%	0.00%	0.00%

Section 6. Abstract

A condensed description to briefly convey to other fish and wildlife scientists, managers

StreamNet seeks to create, maintain, and distribute regionally consistent biological information for use in monitoring Fish and Wildlife Program effectiveness as well as for a wide range of other FWP-related purposes. Data are delivered via the Internet and custom products. StreamNet also provides technical assistance and services to a range of FWP activities and projects. The StreamNet Library maintains original source materials for data in the StreamNet system and provides a full range of library services to Columbia River Basin fish and wildlife scientists, managers, and policy makers.

StreamNet is a cooperative venture of the region's fish and wildlife agencies and tribes and serves as a principal vehicle for coordinating data activities among these organizations. Data development targets critical FWP and related data needs. Data categories include anadromous species production and survival trends, anadromous and resident species distribution and life history, habitat, dams and other facilities, historic river operations, and mitigation projects.

In response to ISG and ISRP recommendations, the StreamNet data plan is being revised to include population and genetics, age and sex composition, and additional resident fish and habitat parameters. StreamNet is also intensifying efforts on support services for other FWP activities and projects. Services may include technical support, custom products, and data storage and delivery. Service will specifically target 1) tracking of FWP projects, 2) monitoring and evaluation activities, and 3) watershed, stock assessment, and research projects. Other services will include maintaining project records through the StreamNet Library and increased use of the StreamNet Internet site to deliver FWP-related information.

Section 7. Project description

This full description of the project should be in sufficient detail to include the following information under headings a through g **(maximum of 10 pages for entire project description)**:

a. Technical and/or scientific background. The overall problem should be clearly identified with background history and scientific literature review, if a research project. Location should be specific, if relevant. Goals and objectives of the 1994 Fish and Wildlife Program (FWP), NMFS Biological Opinion, or other plans in relation to the proposed project should be stated and described in some detail. Indicate whether the project mitigates losses in place, in kind, or if out-of-kind mitigation is being proposed.

foundation for scientifically-based action and the means to evaluate the effect of action. Information also provides the basis for educating decision-makers and the public as to the need for action. The issue at hand is not whether information is needed but rather what information is needed, how it should be developed, and how it should be made available. Each of these will be addressed in turn. Collectively they provide the rationale for StreamNet and for the continued inclusion of this critical data development activity in the FWP.

Data Needs. A central tenet of to the Council's FWP is the stated goal to double Columbia River Basin adult salmon populations without losing biological diversity (NWPPC, 1992). Measuring progress toward reaching this goal requires data on salmon production and survival. Natural and hatchery production, juvenile abundance, ocean and inriver harvest, hatchery returns, adult abundance, sex and age ratios for returning adults -- all are important factors that need quantification. Measuring progress toward the run doubling goal also requires that these data factors be compiled over time in order to identify both short and long-term "trends." It is also vitally important that the sources of these data be documented and that source materials be maintained over the long-term. In the 1987 and 1994 versions of the FWP, the Council specifically identified the need for compilation of data related to production and survival and for the creation of an information system to coordinate this activity (NWPPC, 1987; NWPPC, 1994).

Both the 1987 and the 1994 FWP also identified other types of data that should be included in this information system, including - among others - habitat, mitigation projects, and the results of applicable research. 1996 and 1997 saw the release of three major reports by the scientific community that expanded the scope of the FWP data development effort (NRC, 1996; ISG, 1996; ISRP, 1997). From an ESA perspective, the Snake River Salmon Recovery Team made similar recommendations (SRSRT, 1997). Collectively, these reports called for a FWP based on what the ISG termed a "normative" ecological foundation. From a management perspective, this means more emphasis on populations, life stages, habitat, watersheds, and the coordination of FWP and other restoration activities. These management needs translate directly to information needs. The StreamNet Steering Committee has reviewed the data plan in light of the recommendations offered in these reports and has revised it to conform with both the 1994 FWP and subsequent scientific guidance.

Coordinated and Consistent Approaches. In addition to identifying the types of data needed, the 1994 FWP also directed that these data be compiled through a coordinated

share existing data and work collectively to develop new data, and 2) compile both existing and new data using regionally consistent data exchange standards and formats.

Over the past year significant attention has been given to identifying ways that the FWP might be unified around scientific principles. The Council's draft Framework Report (NWPPC, 1997) and CBFWA's draft Multi-year Implementation Plan placed significant emphasis on this. Both suggested the need for information systems to support this more holistic and scientific perspective. Programs outside of the FWP have also called for a coordinated approach to aquatic data. The Proposed Snake River Salmon Recovery Plan made specific mention of this in Section 0.3.a, where NMFS, in agreeing with a proposal by the Snake River Science Review Team, called for the region to "consolidate regional efforts to develop a coordinated information and data gathering system" (NMFS, 1995). While providing obvious cross-program benefits, a coordinated data system is also likely to provide significant benefits to future Endangered Species Act listing and recovery activities. The National Research Council's evaluation of the relationship between science and the ESA called for a more "structured" approach to ESA evaluations and identified the need for accurate and consistent data as a critical component (NRC, 1995). The need for a coordinated approach to data was also recently identified in the Ecological Assessment component of the ICBEMP (Quigley and Arbelbide, ed., 1997).

Technological Advances. The increasing awareness of the need for coordinated approaches to data development comes at a time when there is a major explosion in data technology. Database management systems have become infinitely more powerful and flexible over the past five years. Geographic information system technology is making similar advances. Database and GIS technologies are beginning to merge, greatly increasing the utility of both. Hydrographic referencing systems are being made available at much higher resolution, and, of course, the Internet has opened up vast new opportunities for communicating with others and, especially relevant to the current discussion, for providing a vehicle to transmit critical biological and management data.

Conclusion. The three factors described above - data needs, data consistency and coordination, and technological advances - form the nucleus of the StreamNet project and the rationale for continuing to include it as a component of the FWP regional coordination strategy. StreamNet targets its data development on explicit FWP needs, both the core production and survival data that will arguably always be needed to perform FWP-wide monitoring and evaluation, and the emerging need for ecological and managerial data. StreamNet emphasizes consistency in data development, both across geographic areas and

StreamNet is also capable of providing substantial technical services to the Program and individual projects within it. This topic is treated in detail elsewhere in this proposal and so is not addressed here. In reviewing this proposal the reader should note that it does not address data needs associated with inseason river operations as this is covered by the Fish Passage Center.

b. Proposal objectives. Specific, measurable objectives or outcomes for the project should be presented concisely in a numbered list. Research proposals must concisely state the hypotheses and assumptions necessary to test these. Non-scientific projects must also state their objectives. Clearly identify any products (reports, structures, etc.) that would result from this project. For example, an artificial production program may state the species composition and numbers to be produced, their expected survival rates, and projected benefits to the FWP. A land acquisition proposal may state the conservation objectives and value of the property, the expected benefits to the FWP, and a measurable goal in terms of production. Methods and tasks (in heading e, below) are to be linked to these objectives and outcomes (by number).

Following is a summary description of the proposed FY 99 StreamNet work statement. The description will focus on Objectives 1 and 4 as these are most relevant to the project selection process. Objectives 2, 3, and 5 provide technical support for the objectives and will only be mentioned in passing. For a list of specific sub-tasks see Section 4 above.

Objective 1 - Data Development. *Increase the knowledge base concerning the region's fish and wildlife resources through the acquisition of new information that responds to emerging needs as well as the updating and enhancement of anadromous production and survival trends and other existing information.*

Except where otherwise noted, the product for each of these tasks will be specific, pre-defined data products compiled using standard exchange formats, integrated into the StreamNet data system, and made available via the StreamNet Internet site. Data will build on current StreamNet data holdings; these are summarized in Appendices A and B. StreamNet will actively look for opportunities to expand the region-wide dataset through coordination with stock assessment and watershed projects.

Task 1a. Anadromous Fish. This task focuses on the compilation of annual data related

species and life stage distribution. New initiatives for FY 99 include initiating work on population delineation and abundance data.

Task 1c. Wildlife. Activities will focus on the development of an Internet-based product that will display summary information about each FWP wildlife mitigation property. Properties will be located on hot-linked maps. GIS parcel maps and photographs will be included as will a brief summary report. A Program-wide database will be included. StreamNet will also seek to incorporate available data on distribution of sensitive aquatic species. This is a new task for FY 99.

Task 1d. Aquatic Habitat. Activities will include 1) incorporating appropriate data from the ICBEMP, 2) updating existing water quality and flow trend data, 3) compiling historic habitat records as recommended in Return to the River (ISG, 1996, p. 431), and 4) initiating a long-term effort to link field survey data to the StreamNet data system. Items 3 and 4 are new for FY 99.

Task 1e. Facilities. StreamNet will maintain and update existing dam and hatchery data. Work will begin on incorporating fish passage facility data and diversion/screening data.

Task 1f. Mitigation Projects. StreamNet will continue with an effort initiated in FY 98 to create a restoration project database. Both current and past projects will be included. First priority will be given to FWP projects, though ultimately other MOA, state, and federal land manager projects should be included. Implementation of this task will require an agreement on data exchange among participating agencies. Implementation of this task will require a substantial increase in the level of effort over what has been expended in past years (added staff time equivalent to $20,000).

Task 1g. River Operations. StreamNet proposes to create a historic mainstem river operations dataset, with emphasis on flow, water quality indicators including temperature, fish guidance efficiency, juvenile transport and index data, and adult survival. This dataset will complement inseason data compiled by the Fish Passage Center and will be coordinated with the FPC to ensure consistency.

Objective 2 - Data Management and Delivery. *Provide high quality data management services, with specific emphasis on the creation of regionally consistent data sets and the timely delivery of data to users in formats that meets their policy, planning, and management needs.*

and managers. This includes continuing to acquire and catalog StreamNet data source materials and other critical documents and providing open and efficient access to these materials.

Measurable objectives will include 1) cataloging of all StreamNet data system source materials as supplied by participating agencies, 2) successful completion of all appropriate service requests, and 3) continued increase in use of the StreamNet Library.

Objective 4 - Services to the Fish and Wildlife Program and Related Aquatic Resource Restoration Activities. *Provide substantive technical data services to Fish and Wildlife Program decision-makers and appropriate Fish and Wildlife Program projects.*

In the past, StreamNet technical services to the FWP have been provided on a case-by-case basis with the level of assistance dependent on staff availability and other priorities. Only a generalized statement about "providing technical assistance to others involved in the Fish and Wildlife Program" has been included in previous StreamNet work statements. However, the demand for services has grown substantially, as has the amount of staff time spent on this activity. For FY 99 StreamNet proposes to formalize the services provided to other FWP activities and projects. The technical assistance tasks identified here provide the range of available services. Services will be provided within the confines of the budget, with priorities and specific activities determined in consultation with NWPPC and CBFWA.

It is difficult to identify, before the fact, specific measurable objectives for these service-oriented tasks. StreamNet proposes to treat these activities as one would a consultant-client relationship. That is, the extent to which the objective is reached will be determined by the satisfaction of the client - in this case NWPPC, CBFWA, or specific FWP projects. (If formal evaluation is desired, a "client satisfaction survey" could be undertaken as a means to evaluate adequacy of services.) Proposed services include:

Task 4a. Project Tracking. StreamNet will incorporate data from task 1f. above into a computerized project tracking system that can be used by managers to target restoration resources and evaluate overall effectiveness. StreamNet will also prepare custom Internet products that display proposed AIWP projects and array these in a variety of ways that will help decision-makers evaluate projects (www.streamnet.org, click on Fish and Wildlife Program).

Task 4c. Watershed Projects. Actions that will be undertaken in support of watershed and habitat projects are described in Section 8 below.

Task 4d. Stock Assessment Projects. Actions that will be undertaken in support of stock assessment projects are described in Section 8 below.

Task 4e. Analysis. Actions that will be undertaken in support of analysis projects are described in Section 8 below.

Task 4f. Research. Actions that will be undertaken in support of research projects are described in Section 8 below.

Task 4g. Special Projects. This task is included in order to provide for special services as requested throughout the year. For example, the Council's FY 98 AIWP (NWPPC, 1997) references two mainstem habitat projects where StreamNet has been asked to provide GIS and other technical services.

Task 4h. Internet Access. StreamNet will provide Internet access for information about, and data from, select FWP projects. This task is described in Section 8 below.

Task 4i. Reports and Plans. StreamNet staff will be available to prepare custom data reports for use in applicable FWP reports and plans.

Task 4j. Protected Areas. StreamNet will maintain the official version of the Council's Protected Areas dataset. Data underlying this dataset will be maintained and/or archived in order to retain the historic record. StreamNet will also respond to requests for information concerning Protected Areas as requested by the Council.

Objective 5 - Project Management. *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.*

StreamNet spends a relatively small amount of project resources on project management. Both project managers and steering committee members actively participate in producing products as identified in objectives 1-4. Project management will be evaluated based on 1) success in delivery of products for each task, and 2) meeting the project budget.

other project proposals, and existing projects. Any particularly novel ideas or contributions offered by the proposed project should be highlighted and discussed.

StreamNet exists to provide data and data services to the FWP. While there are other projects that address specific data issues that are critical to the FWP - notable examples include the Fish Passage Center and Pit-Tag - StreamNet is the only regional entity that addresses FWP data needs from a multi-issue, Program-wide perspective. In this regard, it is not an exaggeration to suggest that StreamNet serves as the FWP's principal data service center.

StreamNet and its predecessor project the Coordinated Information System (CIS) derive their principal guidance from the 1987 and 1994 Fish and Wildlife Programs. The Council's 1987 Program directed that a "coordinated information system" be established in order to "facilitate effective exchange and dissemination of fisheries data." The Council provided the following guidance:

" This will entail the coordination of system-wide data collection programs; identification of data collection needs; and the development of standards for data reporting, storage and retrieval. It also will include coordination of the data collection activities of the program, especially those under Section 206(e) (i.e., a hatchery database and a natural production database), with other large-scale efforts, including those conducted by the Pacific Salmon Commission, the Pacific Fishery management Council, the North Pacific Fishery Management Council, the Pacific Marine Fisheries Commission, and the federal, tribal, and state harvest managers" (NWPPC, 1987, 206.d.2.C).

The Coordinated Information System (CIS) was formally established as a project in 1988. In 1991 the Integrated Systems Plan clarified the role of the CIS as follows:

"(CIS should) facilitate the collection of data and the development of new data bases so that the information they contain may be used in the monitoring and evaluation of Columbia River stocks. (Information will include) research results from past, ongoing, and future studies on salmonids from the Columbia River and elsewhere. A particularly important part of this information will be results of studies specifically designed to address critical uncertainties. Information on natural and hatchery production will be accessed as will information on ocean and inriver harvest. Finally, the CIS will use information from the BPA's Project Management Information System, which tracks all of BPA's research and enhancement projects." (CBFWA, 1991)

cost-effectiveness of research, monitoring and evaluation by ensuring that information produced by these programs is readily available to the region." (NWPPC, 1994, 3.3)

The Council went on to call for:

1. An annual program monitoring report based on CIS information (3.3A.2),
2. Creation of an anadromous fish database that would include data from the 1992 Stock Summary Reports and "other natural, hatchery and systems information" (3.3B.1),
3. A scientific information data base that would include "existing information from fish and wildlife program projects, other regional research efforts, and related national and international anadromous fish research" (3.3C.1),
4. A habitat data base (3.3D), and
5. A project accounting data base that would track FWP and other restoration activities (3.3E).

The StreamNet data plan and proposed FY 99 work statement responds directly to the above Program directives. The work statement also seeks to respond to data needs identified in other documents directly associated with the FWP, including the tribes' Spirit of the Salmon restoration plan (CRITFC, 1996), the draft Snake River Salmon Recovery Plan (NMFS, 1995), Return to the River (ISG, 1996), the draft Multi-year Implementation Plan (Fish and Wildlife Managers, 1997), the Independent Scientific Review Panel report to the Council (ISRP, 1997), Appendix A to the CBFWA's proposed FY 98 Annual Implementation Work Plan (CBFWA, 1997), and the Council's FY 98 Annual Implementation Work Plan Recommendations (NWPPC, 1997).

In preparation for this proposal, StreamNet staff conducted a detailed review of the above documents in order to identify references to data needs that relate to StreamNet. Correlations were drawn between these sources in order to identify overlaps and differences. Findings were then compared to the StreamNet data plan and the plan modified to incorporate these data needs. The data plan was then incorporated into the task list included in this proposal. The proposal for technical services to the FWP identified in Objective 4 - Services to the Fish and Wildlife Program - also responds directly to needs expressed in these documents.

The reader is directed to Appendix C which presents a summary of the relationships between StreamNet's proposed FY 99 tasks and important data and data service needs as contained in these documents. Having completed this exercise, the StreamNet Steering

- project reports and technical papers
- summary of major results achieved
- years underway (see attached spreadsheet)
- past costs (see attached spreadsheet)

Past Costs

Year	Amount
1996	$1,762,833
1997	$1,932,455
1998	$1,932,455

Past Project Numbers

Project #	Name
360	Regional Rivers
88-108	Coordinated Information System (CIS)

The FWP's biological data system (and StreamNet) had its start with the NWPPC-sponsored Hydro Assessment Study as directed in the 1984 version of the Council's Fish and Wildlife Program (NWPPC, 1984, 1200.C.1 and 2). That project had two components -- the Anadromous Fish Assessment and the Pacific Northwest Rivers Study. Together, these studies represented the first attempt to create a Basin-wide fish and wildlife data system. Data derived through these studies were the basis for the Council's 1987 Protected Areas designations, still recognized as one of the FWP's major accomplishments.

The Pacific Northwest Rivers Study evolved into the BPA-sponsored Northwest Environmental Database (NED). Through NED, BPA contracted with each of the four states to maintain and enhance data produced through that study. NED managed the EPA river reach system and development a significant GIS capability. NED also secured sensitive species data from state heritage programs and helped to support BPA's hydro facility database.

The Anadromous Fish Assessment became the foundation for the Council's Subbasin Planning initiative (NWPPC, 1987, 205.a and b). This initiative represented the first attempt within the Columbia Basin to systematically and comprehensively categorize anadromous fish production potential for each of the Basin's subbasins. Also compiled were data on habitat quality and the major issues that inhibit fish production. Subbasin

Columbia Basin anadromous salmonid stocks. In 1994 CIS released the first version of its Distributed System (DS), an anadromous fish database with query capability. The DS was distributed via diskettes to fish and wildlife managers throughout the region. Both the underlying data and the query system were subsequently enhanced, with Windows versions released in 1995 and 1996. (The 1996 DS is available for download through the StreamNet web site.)

In 1996 CIS and NED were merged into one project and given the name "StreamNet." This action was taken partially as a cost savings measure, and partially in recognition of region's evolving data needs. A Steering Committee was formed and charged with project oversight, and a long-term data plan was prepared to guide data development activities. Given that the new project was to be funded through the FWP, issues regarding funding of NED activities not directly related to the FWP had to be resolved. (Two items, the Northwest Hydro Site Database and funding for state heritage program data were subsequently removed from the StreamNet contract.) In 1996 StreamNet prepared a Report on the Status of Salmon and Steelhead in the Columbia River Basin (Anderson, *et al.*, 1996), relying on CIS datasets as the principal data source. In that year StreamNet also initiated its Internet data delivery system, including a query system to access anadromous fish data.

In 1997 significant energy went into updating anadromous fish datasets, integrating resident fish data into the system, creating a 1:100,000-scale fish distribution data layer, enhancing the 1:100,000 river reach system, and incorporating data into this system. The StreamNet Internet site was also significantly enhanced, both in terms of data and capabilities. Efforts were also increased to target StreamNet data and data services to meet specific FWP needs. One notable 1997 product in this regard was an Internet version of the FY 98 Annual Implementation Work Plan (www.streamnet.org, click on "Fish and Wildlife Program").

In 1998 StreamNet moved its data system to a new Internet server system offering greatly enhanced data, map, and library queries. The reader is directed to the StreamNet web site for a preview of these capabilities (www.streamnet.org, click on online data, maps, or library) . The scope of the StreamNet data plan was also expanded to respond to emerging FWP data needs.

e. Methods. How the project is to be carried out based on sound scientific principles should be described (this is applicable to all types of projects). Include scope, approach,

- any risks to habitats, other organisms, or humans
- justification of the sample size
- methods by which the data will be analyzed
- methods for monitoring and evaluating results
- kinds of results expected

Each proposer should complete the methods section with an objective assessment of factors that may limit success of the project and/or critical linkages of the proposal with other work (e.g., a smolt monitoring program, etc.).

StreamNet is a data service and coordination project. In contrast to most FWP projects, which emphasize scientific methods, StreamNet's principal methods are technical and managerial. Methods employed in StreamNet differ by project objective, as follows:

Objective 1 - Data Development. StreamNet focuses on compilation of biological and related data collected by agencies, tribes, and others. All StreamNet data meets accepted scientific standards; sources are referenced and source documents stored in the Streamnet Library. Data development activities proceed in accordance with the StreamNet data plan, which identifies data that will be targeted over the next few years and the highest priorities for the current year. Data priorities are selected by reviewing FWP data needs and assessing the availability and practicality of securing these data. Adding new data elements to the system typically proceeds in stages, including 1) a scoping process, 2) a test case in one geographic area, 3) development of data exchange standards, and 4) actual compilation. Compilation may proceed system-wide or be staggered depending on data availability, staff availability, and immediacy of need. Increasingly, StreamNet participants are focusing their data compilation efforts on smaller geographic areas and using GIS technology as a means to secure and display data.

Objective 2 - Data Management and Delivery. Data management involves efforts at both the regional and agency levels. At the regional level StreamNet employs a regional data manager and a GIS specialist. The regional team is responsible for establishing consistent data compilation practices, for incorporating data supplied by participating agencies into the regional datset, and for managing the StreamNet Internet site and other data delivery mechanisms. At the agency level, a database manager and GIS specialist are typically assigned to facilitate data compilation and transfer of data to the region.

Regional data exchange formats and standards are at the core of the StreamNet data

data exchange system. StreamNet data exchange formats can be viewed through the StreamNet Internet site (www.streamnet.org, click on online data and then on “contents”).

StreamNet uses the EPA river reach system as a means to geographically reference data. The reach system offers important hydrologic analyses opportunities including upstream-downstream tracking and the ability to query data at a variety of hydrologic scales from the watershed to the subbasin to the entire Basin. River reach system data and a description of the system are available through the StreamNet Internet site (www.streamnet.org, click on PNW reach system).

Another important element of the StreamNet data management method is the StreamNet Internet data delivery system and, in particular, the data query system that has been incorporated into that system (www.streamnet, click on online data). All elements of the StreamNet data management system are documented and subjected to extensive review prior to implementation.

Objective 3 - Library / Reference Services. The library objective is implemented through subcontract to the Columbia River Inter-Tribal Fish Commission and is overseen by a professional librarian. Collection development proceeds in accordance with an established plan, with highest priority given to gray literature and materials not readily available elsewhere. Cataloging of both StreamNet source documents and other materials is conducted according to an established process that is consistent with accepted library standards. The Library has a written policy concerning public access to and use of materials. Inter-library loans and other services are in accordance with accepted library standards.

Objective 4 - Services to the Fish and Wildlife Program and Related Resource Restoration Activities. StreamNet participants identify opportunities for providing FWP-related services through careful review of FWP documents and related guidance and coordination with FWP participants. StreamNet becomes involved in projects where there is an identified need and where project sponsors and FWP managers actively support this involvement. With regard to analytical services, it is StreamNet Steering Committee policy to draw a strong distinction between data development and data analysis. In StreamNet, data is viewed as being objective and value neutral. StreamNet only becomes involved in analysis activities when asked to do so and then only if another entity defines analysis criteria.

with PSMFC. These agencies have responsibility for assembling data from primary sources within their jurisdiction or geographic area. Each participating agency has a coordinator and a team of database and resource experts and technicians. Data development at CRITFC member tribes is coordinated through a data manager at CRITFC.

Decision Process. Project decisions are made through a Steering Committee consisting of agency coordinators and the BPA COTR. Decisions are made by consensus. NWPPC, CBFWA and NMFS staff are consulted on a regular basis. Having actual project participants on the Steering Committee has the advantage of bringing specific expertise and experience to the decision process.

Coordination with Others. Considerable emphasis is given to coordinating with other applicable activities. StreamNet participants regularly participate in work groups charged with developing data standards and strategies. Networking with others is accomplished through an agreed upon process whereby regional staff follow regional activities and agency coordinators follow activities within their state, agency, or geographic area.

Factors that Might Limit Success. StreamNet secures data from a variety of primary data collection sources. If these sources are unable to provide (or verify) data within the anticipated time frame, StreamNet may not be unable to meet contract requirements. When it is determined that a provider may not be able to deliver, StreamNet managers investigate the situation and decide whether to a) seek a contract modification to delete or postpone the deliverable, or b) as is more often the case, take steps to facilitate product completion by providing technical or data entry assistance.

The wide range of data in the StreamNet data plan provides considerable opportunity to shift work to a different data area in order to allow lagging data development activities to catch up. For example, if current year fish production data development is lagging due to factors beyond the project's control, it is often possible to shift to historic data not previously incorporated into the StreamNet system. Similarly, if species distribution maps are held up it is usually possible to shift to a different species or to a different subbasin. Thus the project continues to move forward with little if any staff down time.

An additional factor that might cause a change in project schedule is the need to respond to short-term requests for custom products. Maps or graphs for policy briefings, a custom dataset for research projects, or a custom Internet display product are typical requests that

minimize disruption by equipment failure; managers and technical staff are prepared for this contingency.

f. Facilities and equipment. All major facilities and equipment to be used in the project should be described in sufficient detail to show adequacy for the job. The proposal should indicate whether there are suitable (based on contemporary standards) field equipment, vehicles, laboratory and office space and equipment, life support systems for organisms, and computers, for example. Any special or high-cost equipment to be purchased with project funds should be identified and justified. Reference to other proposals is allowed but note that limitations of those proposals could effect the evaluation of the ones citing them.

The principal facilities and equipment required for successful implementation of this project are office work areas and computers and related technical equipment. Each participating agency maintains suitable office space for project staff. Costs for work space are included in agency indirect costs unless otherwise specified in the project contract with BPA. The StreamNet Library is housed in leased space on the main floor of the office building that also houses the Columbia River Inter-Tribal Fish Commission. This space is strategically located near several federal and state agency offices and within easy walking distance of public transportation. Its location on the street level next to the main entrance facilitates walk-in business. The library is an appropriate size to both house the collection and provide necessary services.

StreamNet acquired major new Internet server hardware and software in FY 97. Internet communications are made through a T-1 line shared with other PSMFC projects. States and PSMFC have appropriate database, GIS, and word processor equipment and software. Equipment included in the proposed FY 99 budget includes: 1 NT-based GIS machine, 4 PCs (to replace outdated equipment), a memory upgrade for the StreamNet Internet server, select development tools and office software upgrades, and renewal of GIS software licenses.

g. References. (Not included in 10-page limit for this section.) Provide complete citations to all publications referred to in Sections 6a-f. List in order: author(s), date, title, report number, publisher or agency, location. References will not be read by reviewers; the substance of any reference should be described in the text and the source cited. Sample citation:

Rondorf, D.W., and K.F. Tiffan. 1997. Identification of the spawning, rearing and

Anderson, D, R. Beamesderfer, B. Woodard, M. Rowe, and J. Hansen. 1996. Report on the Status of Salmon and Steelhead in the Columbia River Basin. DOE/BP-65130-1, Bonneville Power Administration, Portland, Oregon.

Bonneville Power Administration.1992. Stock Summary Reports. Bonneville Power Administration, Portland, Oregon.

Columbia Basin Fish and Wildlife Authority. 1997. Proposed FY 1998 Annual Implementation Work Plan (Appendix A). Columbia Basin Fish and Wildlife Authority, Portland, Oregon.

Columbia River Inter-tribal Fish Commission and Member Tribes. 1996. Spirit of the Salmon: The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs, and Yakama Tribes. Columbia River Inter-tribal Fish Commission, Portland, Oregon.

Fish and Wildlife Managers of the Columbia River Basin. 1997. Multi-Year Implementation Plan for the Protection, Restoration, and Enhancement of Columbia River Basin Fish and Wildlife Resources (draft). Columbia Basin Fish and Wildlife Authority, Portland, Oregon.

Independent Scientific Group. 1996. Return to the River: Restoration of Salmonid Fishes in the Columbia River Ecosystem (Prepublication version). Northwest power Planning Council, Portland, Oregon.

Independent Scientific Review Panel. 1997. Report of the Independent Scientific Review Panel Report to the Northwest Power Planning Council: Review of the Columbia River Basin Fish and Wildlife Program as Directed by the 1996 Amendment to the Power Act. Northwest Power Planning Council, Portland, Oregon.

National Marine Fisheries Service. 1995. Proposed Snake River Salmon Recovery Plan. National Marine Fisheries Service, Washington, DC.

National Research Council. 1996. Upstream: Salmon and Society in the Pacific Northwest. National Academy Press, Washington, DC.

National Research Council. 1995. Science and the Endangered Species Act. National

Northwest Power Planning Council. 1997. An Integrated Framework for Fish and Wildlife Management in the Columbia River Basin (draft). Northwest Power Planning Council Portland, Oregon.

Northwest Power Planning Council. 1994. 1994 Columbia River Basin Fish and Wildlife Program. Northwest Power Planning Council, Portland, Oregon.

Northwest Power Planning Council. 1987. 1987 Columbia River Basin Fish and Wildlife Program. Northwest Power Planning Council, Portland, Oregon.

Northwest Power Planning Council. 1984. 1984 Columbia River Basin Fish and Wildlife Program. Northwest Power Planning Council, Portland, Oregon.

Northwest Power Planning Council. 1992. Strategy for Salmon. Portland, Northwest Power Planning Council, Portland, Oregon.

Snake River Salmon Recovery Team. 1997. Comments on the ISG Return to the River. Letter to John Etchart, Northwest Power Planning Council, Portland, Oregon.

State of Idaho. 1996. Bull Trout Conservation Plan. State of Idaho, Boise, Idaho.

State of Oregon. 1997. The Oregon Plan. State of Oregon, Salem, Oregon.

Quigley, Thomas M., and Sylvia J. Arbelbide, editors. 1997. An Assessment of Ecosystem Components in the Interior Columbia Basin. USDA Forest Service, Pacific Northwest Research Station, Portland, Oregon.

Washington Department of Fish and Wildlife. 1997. Policy of Washington Department of Fish and Wildlife and Western Washington Treaty Tribes Concerning Wild Salmonids. State of Washington, Olympia, Washington.

Section 8. Relationships to other projects

Indicate how the project complements or includes collaborative efforts with other projects; put the work into the context of other work funded under the FWP. If the proposed project requires or includes collaboration with other agencies, organizations or scientists

StreamNet serves a coordination function within the Fish and Wildlife Program and therefore has significant links to a variety of FWP-sponsored projects. Establishing and implementing a more formal long-term working arrangement with other projects is a primary objective for FY 99. In summary form, the relationship between StreamNet and other FWP activities is twofold. First, StreamNet provides data to these projects, both via the StreamNet database system and the StreamNet Library. Second, StreamNet serves as a means to store and distribute data and documents produced through these projects. This relationship provides a cost-effective means for projects to access important background information and also helps ensure that project-generated data will be available for others in a timely and efficient way.

Among the major services that StreamNet can provide to FWP projects are:

1. Development of consistent data exchange standards, formats, and entry mechanisms,
2. Integration of data into a regionally consistent dataset,
3. Access to data via the Internet and custom products,
4. Library services through the StreamNet Library,
5. Technical database, GIS, and Internet assistance, and
6. Preparation of custom data products for special applications.

Relationships with specific types of FWP projects include:

Watershed and Habitat Projects. One of the emerging trends in the Fish and Wildlife Program is the increased emphasis on watershed-level projects as a means to address production and habitat issues. These projects offer the opportunity to produce a considerable volume of data that, if structured correctly, could significantly enhance the regional knowledge base and thereby increase the region's ability to both focus mitigation activities and conduct scientifically sound monitoring and evaluation. For FY 99, StreamNet proposes to place increased emphasis on services to watershed projects. These services include: a) providing baseline data to watershed projects, b) facilitating creation of consistent biological datasets across all watershed projects, c) providing technical assistance regarding tabular and GIS data development, d) providing access to watershed project data via the Internet, and e) providing a means to maintain data and reports prepared through watershed projects. StreamNet also has the capability to provide significant technical assistance to those involved in the annual watershed and habitat project selection process and proposes to do this starting in FY 99. This could be accomplished through a) preparing a summary of available watershed-level biological and

The direction for StreamNet involvement in this activity comes from the Council's FY 98 AIWP Recommendations (NWPPC, 1997). Section 2 of that report states "The habitat project evaluation and selection process should include provisions to ensure that StreamNet is used to coordinate, accumulate, store, and make available the relevant watershed information, assessments and projects." The Council goes on to suggest that approximately $100,000 should be allocated for this activity.

Fish Stock Assessment Projects. The Fish and Wildlife Program identifies a number of projects that will inventory and evaluate the status of fish, and in particular, resident fish, within specific subbasins. Two such projects are being initiated in FY 98, Resident Fish Stock Status Above Chief Joseph and Grand Coulee Dams (project # 9700400) sponsored by the Kalispel Tribe, and the Snake River Native Salmonid Assessment sponsored by the Idaho Department of Fish and Game (project # 5502000). StreamNet is cooperating with both projects, providing technical assistance and serving as a means to deliver data. StreamNet is also cooperating with MFWP in the development of a resident fish data system in Montana that has similar characteristics.

StreamNet can help to ensure consistency in approaches to data collection among these projects which, in turn, will result in data that is useful for monitoring and evaluation and other Program-wide applications. In its review of the draft FY 98 Annual Implementation Work Plan, the Independent Scientific Review Panel identified the need for a Basin-wide resident fish assessment (ISRP, 1997). The three projects referenced above, coupled with data from the ICBEMP (Quigley, 1997) and other available sources, could serve as the foundation for this evaluation. Inter-project consistency will be essential if the ISRP proposal is to become reality and this will only occur if StreamNet (or some other regionally-oriented program) is present to facilitate data compilation. Technical service to fish stock assessment projects can be accomplished within the regular data management budget; no additional funds were included in the FY 99 budget for this purpose.

Research Projects. The StreamNet Library is equipped to service the reference needs of a wide range of FWP research projects. The Library can provide documents, conduct searches, and facilitate inter-library loans. StreamNet also has an online publication reference system that can give researchers a quick summary of documents available through the StreamNet Library and the NWPPC document collection. The Library can help to ensure that the results of research projects are maintained and made available for other researchers, managers, and policy makers. StreamNet database staff are also

provide Internet access to spreadsheet data and word processor reports prepared through the Yakima-Klickitat project. StreamNet proposes to expand this to other appropriate FWP projects in FY 99. StreamNet is capable of providing these projects with a "mini" home page where project sponsors can post general project information as well as a query system to access project data files for view or download. This arrangement will provide project participants and others with access to data previously unavailable. It will also help to conserve limited FWP funds. Providing this assistance in a meaningful way will require approximately $20,000. This amount is included in the proposed budget.

PATH and Other Program-wide Analyses Projects. StreamNet has the capability to both provide data for FWP analyses projects and, in many instances, to store and distribute data generated through these projects. For example, StreamNet provided the PATH project with redd count data and has integrated spawner recruit data from PATH into the StreamNet data system. Technical service to analysis projects can be accomplished within the regular data management budget; no additional funds were included in the FY 99 budget for this purpose.

Fish Passage Center. StreamNet and the Fish Passage Center (project # 9403300) each provides a set of products and services that serve distinct FWP needs. These products are complementary and conscious effort is made to ensure that there is no duplication of data or services. The FPC provides "real-time" (e.g., daily/weekly) in-season data related to mainstem river operations and smolt monitoring. StreamNet places emphasis on production trends, often at the subbasin or watershed levels, and on other biological factors related to subbasins, watersheds, and individual streams. StreamNet is proposing to incorporate select river operations data into its data system. These will be restricted to historic trend data and will be undertaken in consultation with the FPC. Additional opportunities for cooperative efforts will be explored.

Non-FWP Activities. The StreamNet data and data delivery system can potentially be of significant help to projects and programs that, while not components of the FWP, do contribute to the protection and restoration of Pacific Northwest fish and wildlife resources. For example, the Oregon Plan, initiated by that state to restore salmon, makes extensive use of StreamNet date exchange standards, data query and delivery systems, and fish distribution maps (State of Oregon, 1997). The Oregon Plan is developing its project tracking system in tandem with StreamNet. Oregon Plan project tracking activities will therefore be consistent with that of the FWP, which should benefit both efforts. As the Oregon Plan expands its data development activities, StreamNet assistance with biological

is predicted as the Bull Trout Plan is fully implemented. Similar state-level initiatives are anticipated in the future in Washington as additional stocks are evaluated for potential ESA listing. Common data compilation procedures across these projects can only help the overall regional fish and wildlife restoration process.

StreamNet also maintains an ongoing relationship with the National Marine Fisheries Service's Endangered Species Act activities. NMFS has contracted with PSMFC (using funds outside of the FWP) to compile a wide range of anadromous fish production and survival data, both within and outside of the Columbia Basin. These data are being integrated into the StreamNet data system. This arrangement provides significant advantages to the FWP. For one, data from outside of the Basin (coastal CA, OR, and WA and Puget Sound) are being compiled in a format consistent with Columbia Basin data compilation, thus increasing opportunities for comparative analyses. For another, this more fully integrates NMFS ESA activities with those of the FWP.

Another related program is the wild salmonids policy recently released by WDFW and Western Washington Tribes (WDFW, 1997). StreamNet staff at WDFW actively coordinate with that initiative in order to ensure mutually supportive data strategies. StreamNet also maintains close ties with Bureau of Land Management and Forest Service Federal aquatic data collection activities. Recognition of the interrelationship between federal land manager and StreamNet data activities was formalized in FY 98 when a representative of the Forest Service joined the StreamNet Steering Committee. StreamNet has been a full participant in the development of the BLM/Forest Service-sponsored IRICC report that identified core habitat variables that all agencies should endeavor to collect as part of their regular stream survey activities. Adherence to these standards will help provide the FWP with a consistent set of habitat data for use in monitoring and evaluation. StreamNet is also cooperating with the BLM and Forest Service in making aquatic data compiled through the ICBEMP available to fish and wildlife scientists and managers via the StreamNet data system. No additional FWP funds will be required in order to coordinate and assist these non-FWP projects. Where additional staff assistance is required this will be secured through other sources.

Section 9. Key personnel

Include names, titles, FTE/hours, and one-page resumes for key personnel (i.e. principal investigator, project manager), and describe their duties on the project. Emphasize

Committee, the project manager, and the regional data manager are considered to be "key personnel." They are listed below. The number in parenthesis represents the number of months allocated to and funded by the StreamNet project. Note that Steering Committee members without a direct contractual obligation to the project Alan Ruger (BPA COTR) and Shaun McKinney (USFS) are not included in this list.

Duane Anderson, marine biologist/data analyst, StreamNet Data Manager (12)
Cedric Cooney, marine biologist, ODFW coordinator (12)
Janet Decker-Hess, fisheries biologist, MFWP coordinator (9)
Jerome Hansen, wildlife biologist, IDFG coordinator (4)
Dick O'Connor, fisheries biologist, WDFW coordinator (2)
Drew Parkin, natural resource planner/policy analyst, StreamNet Project Manager (12)
Stephen Pastor, fisheries biologist, USFWS coordinator (2)
Phil Roger, fisheries biologist, CRITFC and member tribes coordinator (3)
Doug Taki, fisheries biologist, SBT coordinator (3)

Resumes of key personnel follow.

DUANE A. ANDERSON - StreamNet Regional Data Manager

Education:
M.S. in Marine Biology, University of Oregon, Eugene, Oregon. June, 1985.
Thesis: *A Study in the Early Life History of the Striped Bass, Morone saxatilis, in the Coos River Estuary, Oregon*
B.S. in Zoology, Montana State University, Bozeman, Montana. June, 1981.

Current Employer and Responsibilities:
Pacific States Marine Fisheries Commission, StreamNet regional data manager

Previous Employment:
Fisheries Analyst - Northwest Power Planning Council,
Fish and Wildlife Division, Portland, OR. 1992-1994

Data base Development Coordinator - Northwest Power Planning Council,
Fish and Wildlife Division, Portland, OR. 1985 to 1991

Expertise:
1) Development and implementation of large scale natural resource databases, 2) Columbia River anadromous fish issues and modeling techniques, 3) Data development and analysis, 4) NWPPC Fish and Wildlife Program policies, 5) Computer systems and techniques in general, including database management software, communications software, programming tools, Geographic Information Systems (GIS), and tools and methods associated with development and maintenance of complex World Wide Web (WWW) applications.

Publications/Activities:
Database Development Coordinator - NWPPC's hydropower assessment study. Coordinated and supervised data gathering for the anadromous portion of the Council's Hydropower Assessment Study. Designed, implemented, and maintained the Council's Fish and Wildlife data base. Performed detailed analyses using the data base for the Council's Protected Areas rulemaking.

Database Development Coordinator - NWPPC's System Planning Process. Coordinated and supervised data gathering in the Council's System Planning Process, collecting and analyzing fisheries data from 31 subbasins within the Columbia Basin. Designed and developed computerized data gathering models, and maintained the System Planning Model data base.

Fisheries Analyst - NWPPC. - Performed analytic duties as necessary to support and improve the Council's Fish and Wildlife Program. Designed and performed detailed analysis for a recovery plan for ESA listed salmon stocks in the Snake River Basin, using a variety of tools and models, and prepared detailed results and reports for the Council.

Database Consolidation - NMFS. - Manage contract with the National Marine Fisheries Service to consolidate fisheries data collected by other NMFS contractors into the StreamNet database

CEDRIC X. COONEY - StreamNet Steering Committee Member, ODFW Coordinator

Education:

California State University, Long Beach, Bachelor of Science in Marine Biology, 1985

Current Employer and Responsibilities:

Oregon Department of Fish and Wildlife
Oregon StreamNet Project Leader

Previous Employment:

Assistant Project Leader, Coastal Salmon Spawner Inventory Project
Oregon Department of Fish and Wildlife, Corvallis, OR, 1990 - 1997

California Department of Fish and Game, Long Beach, CA
Marine Biologist Range B, Long Beach, CA, 1987 - 1990

California Department of Fish and Game, Long Beach, CA
Seasonal Aide, Long Beach, CA, 1985 - 1986

Expertise:

1) Techniques and methodologies associated with large-scale inventories and assessments of anadromous salmonids,
2) Marine artificial reef development and evaluation techniques,
3) Techniques and methodologies associated with at-sea inventories and assessments of marine pelagic species,
4) Aquatic data development and delivery,
5) Project management and coordination.

Publications/Activities:

State-level Natural Resource Inventory and Assessment:

Author of the *Oregon coastal salmon spawning surveys* summary reports from 1990 through 1995 which documents and summarizes Oregon coastal salmonid inventory results and analysis. Co-author of this same report in 1997.

Co-author of *Improvement of methods used to estimate the spawning escapement of Oregon Coastal Natural coho salmon* research progress report from 1990 through 1994. This progress report documented an experimental Stratified Random Sampling approach to survey site selection in order to more accurately

JANET DECKER HESS - StreamNet Steering Committee Member, MFWP Coordinator

Education:
University of Montana, Master of Science in Fisheries Biology, 1978
Thesis: *Impact on the Aquatic Ecosystem by Mining in the Mike Horse Area, Heddleston Mining District, Lewis and Clark County, MT*
Ohio University, Bachelor of Science, 1974

Current Employer and Responsibilities:
1985 - present
Montana Fish, Wildlife and Parks (MFWP), Kalispell, Montana
Fisheries Biologist and Project Manager for StreamNet in Montana and Coordinator for the MFWP GIS Services Unit - Responsible for gathering, compiling, and maintaining fisheries and wildlife information, providing GIS services to the department, and supervising a staff of 5

Previous Employment:
1986, Yellowstone National Park, Gardiner, Montana
A Biological Study and Instream Flow Assessment of Soda Butte Creek, LaMar Valley, Yellowstone National Park
1981- 1985, Montana Fish, Wildlife and Parks, Kalispell, Montana
Project Manager and Fisheries Biologist - Impacts of Kerr Dam on the shoreline spawning population of Kokanee Salmon in Flathead Lake
1985, American Fisheries Society, Bethesda, Maryland
An Inventory of the Spring Creeks in Montana
1979- 1981, Montana Fish, Wildlife and Parks, Dillon, Montana
Fisheries Biologist, Assessment of instream flow reservations and fisheries populations in selected waterways, of the Beaverhead, Big Hole and Red Rock drainages of southwest Montana
1978-1979, University of Montana, Missoula, Montana
Instructor, Biological Applications in Water Pollution
1976-1978, University of Montana, Missoula, Montana
Research Assistant, The effects of pollutants and heavy metals on algae development

Expertise:
1) Biological assessment and classification of aquatic resources, 2) Management, development and delivery of multi-disciplinary and multi-platform natural resource databases, 3) River protection and management, 4) Administration of multi-task, multi-staff operation

Publications/Activities:
Officer Montana Chapter American Fisheries Society, 1981-83.
President Montana Chapter American Fisheries Society, 1983-85.
1993 Award for Outstanding Achievement in the Management of Natural Resources, *Western Conservation Administrative Offices Association.*
Decker-Hess, J. and P. Clancey . 1982, 1983, and 1984. *Impacts of Water Level Fluctuations on Kokanee Reproduction in Flathead Lake*. MFWP, Kalispell, MT. 59 pp.

Fraley, J., B. Marotz, J. Decker-Hess, W. Beattie, and R. Zubik. 1989. Mitigation, Compensation and Future protection for fish Populations Affected by Hydropower Development in the upper Columbia System, Montana, USA. *Regulated Rivers: Research and Management*, 3, 3-18.

H. JEROME HANSEN - StreamNet Steering Committee Member, IDFG Coordinator

Education:
University of West Virginia - M.S. in Wildlife Management - 1982
Thesis: *Wildlife Use of Spring Seeps in Northern West Virginia*
Emporia State University - Emporia, KS. - B.S. in Environmental Biology - 1979

Current Employer and Responsibilities:
Idaho Department of Fish and Game
Interstate Resource Data Manager - 2/1993 to Present
Coordination of the Department's wildlife mitigation and StreamNet programs. Terrestrial Work Group Chair on Idaho Power FERC relicensing activities.
Wildlife Mitigation Specialist - 6/1986 to 2/1993
Developed wildlife impact assessments and mitigation plans. Evaluated potential impacts of salmon flow augmentation on resident fish and wildlife.

Previous Employment:
Kansas Fish & Game - District Wildlife Biologist 9/1985 to 5/1986.
U.S. Fish and Wildlife Service - Biological Technician - 4/1985 to 9/1985
Montana Cooperative Wildlife Research Unit - Wildlife Research - 6/1983 to 3/1985
Kansas Fish & Game - Research Assistant - 9/1982 to 5/1983

Certification:
Completed Habitat Evaluation Procedure (HEP) training (1985).

Expertise:
1) Evaluation of land use impacts on fish and wildlife resources, 2) development of mitigation and management plans, 3) habitat improvement techniques., 4) fish and wildlife data develop. and delivery.

Publications:
Hansen, H.J. 1983. *An evaluation of herbaceous and woody plantings on Marion Wildlife Area*. Final Res. Report., Kansas Fish and Game. Pratt, KS. 59 p.

Hansen, H.J., and R.C. Martin. 1989. *Phase II, Wildlife protection, mitigation, and enhancement plan, Dworshak Reservoir*. Final report, IDFG. BPA Proj. 87-111.107 p.

Martin, R.C., and H. J. Hansen. 1986. *Wildlife protection, mitigation, and enhancement plan, Palisades project*. Final report, IDFG. BPA Proj. No. 86-73. 109 p.

Meuleman, G.A., H.J. Hansen, and R.C. Martin. 1987. *Wildlife protection, mitigation, and enhancement plans for Anderson Ranch and Black Canyon facililities*. Final report, IDFG. BPA Proj. No. 86-73. 95 p.

Riggin, S.H., and H.J. Hansen. 1992. *Phase I water rental pilot project: Snake River resident fish and*

RICHARD J. (DICK) O'CONNOR - StreamNet Steering Committee Member, WDFW Coordinator

Education:

University of Washington, Master of Science in Fisheries Population Dynamics, 1977

Thesis: *Ocean Growth, Mortality, and Maturity of Columbia River Fall Chinook Salmon*

Ripon College, Bachelor of Arts in Mathematics and Science; Secondary School Teaching Certification, 1975

Current Employer and Responsibilities:

Washington Department of Fish and Wildlife (1977-present)

Manager, Fish Resource Data and Systems

Expertise:

1) Salmonid stock management techniques and issues; 2) Database design, construction and maintenance; 3) Computer program design, construction, and maintenance; 4) Computer hardware and software troubleshooting and repair; 5) Project management; 6) Staff supervision

Publications/Activities:

Data systems development. 15 years experience assessing user needs, designing, constructing, testing, and deploying computer systems for professional fish managers in WDFW.

Database development: 20 years experience assessing user needs, designing, constructing, and maintaining datasets and database systems for professional fish managers in WDFW.

Region-wide data sharing projects: 15 years experience developing fish data exchange formats and common systems for West Coast states and British Columbia through the PMFC/PSMFC Committee on Anadromous Fish Marking and Tagging, the Pacific Salmon Commission Data Sharing Committee's Standing Work Group on Data Standards, and the Northwest Power Planning Council’s StreamNet Project.

DREW O. PARKIN - StreamNet Regional Project Manager

Education:
University of New Mexico, Master of Community and Regional Planning, 1986
Thesis: *The Design of Natural Resource Policy: The Maine Rivers Study*
University of Utah, Bachelor of Science in Political Science, 1970

Current Employer and Responsibilities:
Pacific States Marine Fisheries Commission, StreamNet project manager

Previous Employment:
Chief, Division of Rivers and Special Studies
National Park Service, Boston, MA, 1992 - 1995

Partner, Natural Resource Consulting Firm
Land and Water Associates of Maine, Hallowell, ME and Cambridge, MA, 1984 - 1992

Natural Resource Policy Analyst
State of Maine, Augusta, ME, 1981 - 1983

Forestry Technician, Recreation Supervisor
US Forest Service, Logan, UT, 1975 - 1980

Expertise:
1) Techniques and methodologies associated with large-scale river resource inventories and assessments, 2) NWPPC Fish and Wildlife Program policies and procedures, 3) Federal and state aquatic resource management laws and policies, 4) Fish and wildlife issues and policies, 5) Aquatic data development and delivery, 6) Project management and coordination.

Publications/Activities:
State-level Natural Resource Protection Policy. Author of the *Maine Rivers Protection Act of 1983*, the nation's first comprehensive, state-wide rivers protection act. Among other things, the Act protected Maine's salmon run rivers from instream and shorelands development. Author of the *Maine Lake Shoreland Protection Policy*, which established shorelands protection zones on over 1,000 lakes and ponds.

Hydropower Policy. Leading role in establishing comprehensive hydropower plans and state use of 401 water quality certification to protect aquatic resources from inappropriate development. Author of the *Maine Comprehensive Hydropower Development and Resource Protection Plan*, the nation's first state-wide hydropower plan. Principal consultant to the *State of Washington Hydropower Plan*. Significant role in the design of the *NWPPC Protected Areas Policy*. Author of the *National Park Service Hydropower Mitigation Policy*.

Federal Water Resource Project Mitigation. Author of Federal Register rules that direct how the Utah

policies and procedures. Coordinated studies and designation of 7 wild and scenic rivers and contributor to several others. Major contributor to the designation of Oregon's Klamath River as a W&S River.

PHILLIP B. ROGER - Steering Committee Member, CRITFC and Member Tribes Coordinator

Education:
University of Washington, Ph.D. Candidate, emphasis in ecological modeling, 1976
University of Washington, M.S. Fisheries, emphasis in population dynamics, 1971
University of Washington, B.S. Fisheries, minors in mathematics and chemistry, 1968

Current Employer and Responsibilities:
Columbia River Inter-Tribal Fish Commission, 1980 - present
Manager, Fisheries Science Department

Previous Employment:
Quinault Indian Nation, Taholah, WA, 1975-1980
Biometrician, Harvest Manager

University of Washington, Seattle, WA, 1971 - 1975
Fisheries Biologist, Project Leader

Expertise:
1) Devising and evaluating strategies for salmon restoration, 2) Information management, 3) Pacific Northwest salmon policy issues, 4) Fishery harvest management.

Publications/Activities:
Salmon Restoration Issues:
Lead Author: *Wy-Kan-Ush-Mi Wa-Kish-Wit*, Chapter 5; *Multi-year Implementation Plan for thePprotection,Rrestoration, and Enhancement of Columbia River Basin Fish and Wildlife Resources*, Section 5.5; *Draft FY 1998 Annual Implementation Work Plan*, Appendix A.

Co-author: *An Annotated Compendium of Spawning Ground Surveys in the Columbia River Basin Above Bonneville Dam*, 1960 - 1984; *Observations on the Accuracy of Redd Counting Techniques Used in the Columbia Basin*.

Information Management:
1) Designed and created the "Bristol Bay Database" containing all available information on freshwater production of sockeye salmon in the Kvichak River system, Alaska, 2) Designed and implemented a realtime data acquisition and analysis system for Quinault fishery management, 3) Designed, acquired, and implemented a VAX/PC computer system for 50 users, 4) Coordinated Information System (now StreamNet) project manager.

Pacific Northwest Salmon Policy Issues:
1) Member, Northwest Power Planning Council Monitoring and Evaluation Group - a team responsible for evaluating the effectiveness of efforts to restore salmon runs in the Columbia Basin, 2) Member, Northwest Power Planning Council Genetics Workshop Steering Committee, 3) Expert witness in the U.S. v. Washington and U.S. v. Oregon treaty fishing rights cases

DOUG TAKI - StreamNet Steering Committee Member, Shoshone-Bannock Coordinator

Education:

Idaho State University, B.S. in Biology with emphasis in fish ecology

Current Employer and Responsibilities:

Shoshone-Bannock Tribes, Fort Hall, 1993 - present
Sockeye Research Program Manager

Previous Position:

Resident Fisheries Manager
Shoshone-Bannock Tribes, Fort Hall, ID, 1991 - 1993

Expertise:

1) Techniques and methodologies for evaluating stream and riparian habitats, 2) Techniques and methodologies for evaluating lentic habitats, 3) Fish sampling techniques (e.g. screw traps, weir operations, gill nets, electrofishers, etc.) and subsequent evaluations, 4) All phases of using PIT tags for evaluating migration performance of anadromous fish, 5) All phases of conducting and analyzing hydroacoustic surveys, 6) Statistics including biometry , 7) SCUBA certified.

Publications:

6 annual reports for Bonneville Power Administration-administered Fish and Wildlife Program projects.
4 annual reports for Bureau of Indian Affairs fish management projects.
2 annual reports for Idaho Department of Fish and Game fish management projects.

Activities:

Responsible for all aspects of the Shoshone-Bannock Tribes (SBT) Snake River sockeye research project. Specific responsibilities include: 1) staff supervision (one biologist, one full-time and one temporary technician, and a limnology subcontractor), 2) coordinating field work with the IDFG, 3) conducting all hydroacoustic analyses and PIT tag evaluations, 4) contract management (writing annual Statement's of Work and itemized budgets, tracking expenditures, ensuring completion of tasks, monitoring subcontractor performance, and preparing annual reports to the Bonneville Power Administration), and 5) coordination between this project and related activities.

Liaison between Tribal government and the IDFG, NMFS, BPA, IDEQ, and USFS for all sockeye-related management and research related issues. Represent the SBT on the Stanley Basin Technical Oversight Committee and share responsibility on the Fish Passage Advisory Committee and Anadromous Fish Managers forum.

Section 10. Information/technology transfer

How will technology or technical information obtained from the project be distributed or otherwise implemented? Methods can include publication, holding of workshops, incorporation in agency standards or facilities, and commercialization.

The principal means employed by StreamNet to transfer information are: 1) the Internet, 2) the StreamNet Library, 3) reports, and 4) custom products. These are discussed in order.

Internet. StreamNet - and hence the FWP - has made a considerable investment in developing a state-of-the-art Internet data delivery system. In FY 97 new hardware and software were acquired that greatly enhanced the project's Internet capability. In FY 98 StreamNet developed and released a powerful, flexible and user-friendly data query system that allows Internet users to access data, maps, and library references. All StreamNet datasets are readily available through this system. Significant features include 1) multiple approaches to query data depending on user needs, 2) ability to query for data at a broad range of geographic scales including watersheds, subbasins, subregion, and the entire Columbia Basin, as well as administrative jurisdictions, 2) creation of user defined maps, 3) extensive charts and graphs, 4) bibliographic references to all data, and 5) flexible data download options. A similar query system provides access to StreamNet library holdings. While the query system and the data underlying the system is the principal product, the StreamNet web site also contains a range of other features including fish and wildlife-related links, a glossary, a fish species database, and a variety of educational features suitable for the general public. Most features are designed to be readily accessible by novice Internet users. Some features, such as the 100K River Reach File focuses on a more limited, technical audience. StreamNet also maintains a "project management" feature that provides an effective means to distribute information among the several organizations involved in the project.

StreamNet is currently exploring creation of a "stand-alone" version of the StreamNet data query system that will be imprinted on CDs and made available via mail or hand delivery for use by those lacking Internet access or for specialized applications. This stand-alone product will also provide a means to archive data for historical and perhaps legal purposes. This will be of particular value to researchers who wish to reference a specific version of the database in publications.

range of FWP-related reports and literature. The reader will note that the ISG has expressed concern that FWP-generated research is not being made available in a timely fashion and that this hampers the region's ability to implement adaptive management strategies (ISG, 1996, p. 430). The Library is in a strategic position to respond to this concern. To do so will require establishment of necessary protocol by BPA, CBFWA, and/or NWPPC.

Reports. StreamNet participants prepare a variety of technical papers related to data development, data management, and electronic data delivery. These are principally of interest to project participants and others in the region involved in FWP coordination or related data activities. These products are available to the public both in "hard copy" and via the StreamNet home page where reports are posted for viewing and download in formats that meet the needs of a variety of users. The Report on the Status of Salmon and Steelhead Production in the Columbia River Basin (Anderson, *et al*., 1996) is an example of the type of report that StreamNet might prepare. (View this at www.streamnet.org, click on fish facts, then on the document name.) The project also maintains a frequently updated project brochure, computer presentations, and other materials that inform the public about the project. These are made available via the StreamNet home page, the StreamNet Library, and other forms of public distribution.

Custom Products. StreamNet participants prepare a variety of special purpose data and electronic map products. Both tabular data and GIS products are delivered via ftp, the StreamNet Internet site, on disk or CD, or as paper reports or maps.

Appendix A. Anadromous Fish Data Holdings for Version 98.1 of *StreamNet Online.* Table shows year range of available data and number of trends available in parenthesis. Blank cells indicate fewer than 10 available trends or no data available.

	Adult Data							
Geographic Area	**Species**	**Mainstem Dam Counts**	**Wier / Dam Counts**	**Redd Counts**	**Peak Spawn. Counts**	**Est. of Spawn. Pop.**	**Spawn - Recruit Est.**	**100K Distribu-tion Data**
Alaska	Salmon		1986-1995 (48)					
	Steelhead		1936-1995 (13)					
California	Salmon		1925-1996 (27)	1980-1994 (11)	1962-1993 (10)	1940-1996 (40)		
	Steelhead		1923-1996 (14)		1964-1994 (28)			
Idaho Col. Basin	Salmon		1928-1997 (34)	1952-1996 (78)			1957-1995 (5)	X
	Steelhead			1987-1997 (34)				X
Montana West Side	Various Resident							X
Oregon Coastal	Salmon		1942-1996 (19)		1946-1996 (367)			X
	Steelhead					1967-1993 (162)		X
Oregon Col. Basin	Salmon	1960-1996 (36)	1950-1996 (33)	1949-1996 (75)	1948-1996 (70)	1946-1996 (21)	1938-1995 (8)	X
	Steelhead	1938-1996 (6)	1950-1995 (22)	1959-1997 (147)	1951-1997 (16)			X
Washington Coastal	Salmon				1952-1991 (44)	1967-1992 (80)		X
	Steelhead					1972-1995 (27)		X
Washington Col. Basin	Salmon	1960-1996 (107)	1950-1989 (10)	1948-1992 (45)	1944-1995 (120)	1945-1996 (107)	1955-1995 (5)	X
	Steelhead	1938-1996 (14)				1962-1995 (42)		X
Washington	Salmon		1926-1991		1951-1992	1953-1992		X

		Hatchery Data		Harvest Data					
Geographic Area	**Species**	**Releases**	**Returns**	**FW Sport**	**FW Comm.**	**FW Treaty**	**Marine Sport**	**Marine Comm.**	**Marine Treaty**
Alaska	Salmon			1977-1995 (201)			1977-1995 (138)		
	Steelhead			1977-1995 (12)			1977-1995 (11)		
California	Salmon	1973-1996 (197)					1962-1990 (10)	1952-1990 (24)	
	Steelhead	1975-1996 (27)							
Columbia R	Salmon			1969-1994 (33)	1938-1995 (57)	1938-1994 (6)			
	Steelhead			1963-1994 (42)	1939-1995 (6)				
Idaho Col. Basin	Salmon	1976-1996 (150)	1961-1997 (35)						
	Steelhead	1975-1995 (156)	1965-1996 (30)	1954-1995 (38)					
Oregon Coastal	Salmon	1970-1995 (372) [A]	1962-1994 (59)	1956-1994 (307)			1967-1994 (66)		
	Steelhead	1981-1995 (247) [A]	1983-1993 (24)	1957-1993 (173)			1972-1981 (20)		
Oregon Col. Basin	Salmon	1971-1996 (503) [A]	1945-1995 (91)	1956-1994 (204)					
	Steelhead	1977-1995 (274) [A]	1966-1995 (39)	1956-1993 (157)					
Washington Coastal	Salmon	1960-1996 (1830)	1961-1991 (18)				1950-1994 (59)	1950-1994 (124)	1972-1994 (51)
	Steelhead	1973-1996 (201) [B]		1962-1994 (183)			1962-1994 (78)		
Washington Col. Basin	Salmon	1960-1996 (1326)	1948-1995 (211)	1980-1994 (101)	1970-1995 (79)	1980-1993 (7)			
	Steelhead	1973-1996 (212) [B]	1957-1995 (12)	1962-1994 (263)					
Washington Puget Sound	Salmon	1960-1997 (3540)	1938-1991 (47)						
	Steelhead	1974-1996 (201)		1962-1994 (450)					

A = Does not include untagged, unassociated releases prior to 1982

Appendix B. Non-Anadromous Data Contents for Version 98.1 of *StreamNet Online*.

Data Category	Description / Status
Dams Facilities	Complete for hydropower and dams 10ft and over in size for states of ID, MT, OR, and WA.
Hatchery Facilities	Complete for anadromous fish production facilities, partially complete for resident species for states of ID, MT, OR, and WA
Reference Library	8,644 references as of 12/97, includes bibliographic citations from Northwest Power Planning Council.
Mean Monthly Tributary Flow Data (USGS)	Complete through 1994 for most USGS gauging stations, daily data available from Regional Data Manager
Mainstem Dam Flow Data	Daily Flow and spill data by project from 1960-1993.
Protected Areas Data	Complete protected areas listings by stream from Northwest Power Planning Council Rulemaking in 1989.
Rivers Study Final Value Classes	Complete listings by reach of final values classes from Pacific Northwest Rivers Study.
Nearshore Ocean Upwelling Indices	Monthly Mean data for 11 west coast stations from 1946-1997. Request data from Regional Data Manager.
Sea Surface Temp and Pressure	Complete temperature, pressure, and wind speed from 1854 - 1992, entire Pacific Ocean. Request data from Regional Data Manager.

Appendix C. Relationship Between StreamNet and Regional Policy and Scientific Guidance. This table correlates proposed StreamNet tasks to action items in major guidance documents. References are to sections or pages. Included are both specific references to StreamNet and references to the types of data and data services that can be provided by StreamNet.

	1994 FWP	Tribal Plan	Snake R. Recovery Plan	Return to the River	MYIP	ISRP Report	98 AIWP
Overall Need for StreamNet	3.3A,B,D	5A-4	0.3,0.3.a	p. 430, 449	5.5.1.1, 5.11.3.1		CBFWA 2.5.1.4, 2.7.1
Proposed FY99 Tasks:							
1. Data Development	3.3C.1, 3.3A.1						
1a. Anadromous fish	3.3B.1, 5OF.IS, 7.1C.4	5D-2	0.3.a	p. 432			CBFWA 2.2.3, 2.7.1
1a1. Range, life history	2.2D, 3.3B.1	5D-1	0.3.a	p. 429, 449			CBFWA 2.4.3
1a2. Adult abundance	3.3B.1	5D-2	0.3.a	p. 429	5.5.2.1		CBFWA 2.7.2
1a3. Juvenile abundance	3.3B.1	5D-2	0.3.a	p. 429			CBFWA 2.7.2
1a4. Harvest	3.3B.1	5D-2	0.3.a		5.5.2.1		CBFWA 2.7.2
1a5. Nat. production	3.3b.1	5D-2	0.3.a	p. 429			CBFWA 2.7.2
1a6. Hatchery production	3.3B.1	5D-2	0.3.a				
1a7. Age/sex comp.	3.3B.1	5D-2	0.3.a		5.5.2.1		CBFWA 2.7.2
1a8. Genetics, populations	1b3. Juvenile abundance		4.2.d	p. 444&5, 511, 518	5.5.2.1		
1a9. Fish diseases							
1a10. Index	4.3C.1,	5D-3		p. 426	5.5.2.1		CBFWA

	1994 FWP	Tribal Plan	Snake R. Recovery Plan	Return to the River	MYIP	ISRP Report	98 AIWP
						III.B.15	
1b4. Natural production		N/A	N/A	p. 430	6.4.1	III.B.13	
1b5. Hatchery production		N/A	N/A			III.B.13	
1b6. Genetics, populations	2.2A, 7.1C.1&2	N/A	N/A	p. 444&5, 511, 518	6.4.2 to 7	III.B.14	
1b7. Index populations							CBFWA 2.7, 2.7.2
1c. Wildlife		N/A	N/A				
1c1. Mitigation areaa maps		N/A	N/A		7.4.2		
1c2. Mitigation areas database		N/A	N/A		7.4.2		
1.c3. Range of sensitive species		N/A	N/A	III.A.4			
1d. Aquatic habitat	3.3D.1		1.1.a		5.9.4-1		CBFWA 2.4.3, 2.7.1
1d1. Historic records				p. 431			
1d2. ICBEMP	7.6D		1.1.a	p. 353	5.9.4-1		
1d3. Survey records	7.6D	5B-5-9	1.1.a, 1.1b.3	p. 443	5.9.4-1		CBFWA 2.7.2
1d4. Important habitats	3.3D.1		1.1.a	p. 353, 518			
1d5. Flow			1.5.a				
1d6. Water quality				p. 443			
1e. Facilities							

	1994 FWP	Tribal Plan	Snake R. Recovery Plan	Return to the River	MYIP	ISRP Report	98 AIWP
1f. Mitigation projects						III.A.1	
1f1. FWP projects	3.3E.1					III.A.1	
1f2. Hist. FWP projects	3.3E.1					III.A.1	
1f3. MOA projects	3.3E.1			p. 449	7.4.2	III.B.20	
1f4. Other projects	3.3E.1			p. 449	7.4.2	III.B.20	
1g. River Operations (historic)	3.3C.1		2.1.d.5				
1g1. Flow			2.1.d.5				
1g2. Quality			2.10.a				
1g3. FGE							
1g4. Juvenile transport			2.3.d				CBFWA 2.7.2
1g5. Adult survival			2.1.d.5				CBFWA 2.7.2
2. Data Manage, Delivery	3.3A.1	5D-2	0.3.a				
2a. Data plan, standards	3.3A.1		0.3.a				
2b. Database	3.3.A.1, 3.3C.1		0.3.a				
2c. GIS	3.3D.1		1.1.a		7.4.2		
2d. Internet			0.3.a				
2e. Reach and hydro unit system	3.3E.1				5.5.2		CBFWA 2.2.3

	1994 FWP	Tribal Plan	Snake R. Recovery Plan	Return to the River	MYIP	ISRP Report	98 AIWP
4. Services to FWP							
4a. Project tracking	3.3E.1				8.3.2		NWPPC 9.a
4b. M&E	3.2A.1&2; 4.3C.1; 3.3A.2	5D-2	2.1.d.5	p. 425, 426	5.5.2.1		CBFWA 2.2.3
4c. Watershed projects	3.1D.2, 7.0C.2	vol. II	1.4.a	p. 444		III.B.7	NWPPC 2, p. 10-11
4d. Stock assess. projects	10.8.B&C					III.B.13	NWPPC 2, p. 12
4e. PATH, analysis projects	3.2F.1		0.3.b				
4f. Research projects	3.2G.2						
4g. Specific projects (TBA)							NWPPC 4.b
4h. Internet access	7.0C.2				8.3.1		NWPPC 9.b
4i. Reports and plans	3.2B.1, 3.3A.2		0.3.d		8.3.3		
4j. Protected Areas	12.2						
5. Project Management	N/A						
5a. Supervise project activities							
5b. Coordination with others							

note: In the above table, “98 AIWP” refers to both Appendix A of CBFWA’s AIWP proposal (June 1997) and NWPPC’s AIWP recommendations (September 1997).