StreamNet

Northwest Aquatic Information Network

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Fiscal Year 2001
Annual Progress Report

for

StreamNet

The Northwest Aquatic Information Network

BPA Project Number 198810804

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Introduction

This report presents accomplishments of the StreamNet project for Fiscal Year 2001 (FY-01). The report is organized by Task, rather than by participating agency, to clearly link accomplishments by all project participants to the individual Tasks and responsibilities detailed in the FY-01 Statement of Work (http://www.streamnet.org/about-sn/project_management.html).

Project members participating directly in the StreamNet project were Columbia River Inter-Tribal Fish Commission (CRITFC), US Fish and Wildlife Service (FWS), Idaho Department of Fish and Game (IDFG), Montana Fish, Wildlife and Parks (MFWP), Oregon Department of Fish and Wildlife (ODFW), Washington Department of Fish and Wildlife (WDFW), and the Pacific States Marine Fisheries Commission (PSMFC). These agencies not only conducted the work of the StreamNet project, but they also contributed directly to supporting the project. The specific kinds and amounts of contributed support varied by agency, but included salary support, in-state travel, office supplies, use of computers and computer services, and office space. The project was administered by the PSMFC. The central components of the project conducted by PSMFC staff are referred to in this report as the "Regional" portion of the project. Funding was provided by the Bonneville Power Administration (BPA) through the NW Power Planning Council (NWPPC) Fish and Wildlife Program. A significant change in participation occurred in FY-01. The Shoshone-Bannock Tribes (SBT) dropped out of the project after having been a participant for many years. This change represented a response to increased workloads rather than a lack of interest in the project. Data from the SBT are still being captured through the IDFG StreamNet project.

The StreamNet Project was somewhat hampered in FY-01 by a delay in final approval of the project budget. The effective project budget has been eroded by cost of living adjustments not keeping up with the actual inflationary cost increases. For example, the project was recently impacted by an unanticipated increase in the federal pay scales for computer technology personnel. This is significant because the project budget is primarily composed of personnel costs (84%). Resultant reductions in workforce have led to a consistent decrease in the

ability of the project to conduct its work. The budget request for FY-01 was initially proposed to make up for past differences, but the size of the requested increase caused additional review, and the final budget was not approved until approximately half way through the fiscal year. The increased request was not granted and only a 5% cost of living increase was approved. This resulted in some work beginning late and some work not being done. Several staff members at the Regional level could be funded for only 9 months, forcing those positions to do other work on other contracts for part of the year. A contract to develop data compilations for subbasin summaries through NWPPC helped bridged that gap this year. The ODFW StreamNet Project had significant job vacancies in FY-01, so they took the largest proportion of the budget shortfall of the project cooperators for this year. This allowed the other cooperators to function more at a normal level, but resulted in Oregon not being able to update as many data sets as planned. Oregon was able to fill its vacant database manager position later in the year, and this person has developed procedures and routines that will improve efficiency next year.

As in other years, the majority of effort (three fourths of expenditures) took place at the level of the StreamNet Projects in the subcontracting agencies. These projects focused primarily on acquisition and update of fish related data from the region's state and tribal fish and wildlife agencies, organizing and quality checking the data, conversion of data into the regionally standardized Data Exchange Format (DEF), and submission of data to the regional StreamNet database maintained by regional staff. Acquisition and development of the data are the indispensable first steps in providing data to the region in a consistent format. Without content, data delivery systems are of little value. Other activities at this level included data services within each agency's area of responsibility, response to requests for state or agency level data, management of the StreamNet Library, and participation in overall project direction through the StreamNet Steering Committee.

Regional StreamNet staff at PSMFC maintained the computer and GIS systems necessary to store and manage the data in the StreamNet database and to serve the information through the query system over the Internet at www.streamnet.org. Other activities included quality assessment of incoming data, loading incoming data into the database, overall project management, development of data management and data delivery tools and applications, long term planning, regional data services, and custom data delivery.

A primary focus of the project in the previous year (FY-00) was conversion of most data in the StreamNet database to utilize the Longitude Latitude Identification (LLID) system for tying data to the 1:100,000 scale hydrography layer. That major data conversion delayed some of the normal data update activities in FY-00, leaving a backlog to be addressed in FY-01. Some data sets still needed work with assigning LLIDs, adding to the work addressed in FY-01. In addition to these activities, specific accomplishments in FY-01 included: Development of summaries of all data and maps by subbasin to support the Subbasin Summaries prepared under the Rolling Provincial Review process; Completion of a compilation of data in response to a specific request from the NWPPC on the release of hatchery salmon that had been mass marked with an adipose fin clip in 2000; Initiation of a plan to improve the project's data delivery capabilities through acquisition of new software, including ArcIMS for interactive mapping and data access over the Internet and Cold Fusion for development of more flexible web interfaces; Development of an internal database to track responses to data and service requests; and, Adoption of a new Data Exchange Format (DEF2001.1), which ended a period of frequent change and which has now been stable for a year. Specific accomplishments are described in the four Quarterly Reports (http://www.streamnet.org/about-sn/project_management.html) for FY-01 and as summarized in the body of this report.

Progress was slowed by the lack of comprehensive data management programs within the region's fish and wildlife agencies. This makes data acquisition more difficult and slows data updates due to delays in official release of information from the agencies. Lack of comprehensive agency-wide data management systems also makes data standardization more difficult and time consuming.

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 production and survival trends and other existing information.

Data development (the acquisition of data from the state and tribal fish and wildlife agencies once it has been finalized, error checking, conversion of the data into the region wide Data Exchange Format and submission of the data to the regional database) represents the largest objective of the StreamNet project and takes the largest amount of effort. This work was carried out primarily by StreamNet staff located in the state and tribal partner agencies. Fiscal year 2001 represents a year of playing catch up, since 2000 was primarily focused on conversion of all data to use the new LLID georeferencing system. This year, residual problems with the LLID conversion were rectified, and then emphasis was placed on getting data prepared for submission to the regional database. Progress in data development is described below by data category.

Objective 1 Data Development

Task 1 Anadromous Fish

Acquire data sets related to salmon, steelhead and, where data are readily available, other anadromous fish populations from the multiple agencies, tribes and organizations within the Columbia Basin and compile and maintain them in standardized, consistent formats for the following categories:

Anadromous fish represent the highest value fish species, both sport and commercial, in the Columbia Basin. In addition, these species have suffered from declining populations and a number of populations are listed under the Endangered Species Act (ESA). As a result, developing data for these species has been the highest priority for the project. No anadromous fish occur in Montana, so work on this objective only occurred in the other states. Specific data development activities are described below.

Objective 1 Data Development

SubTask 1.a Distribution, Life History (use type) and Barriers, Anadromous

Document the occurrence, distribution and habitat use of anadromous species, related barriers to migration, and life history characteristics

Distribution, habitat use and barriers are primary data sets. This information receives the greatest amount of 'hits' on the StreamNet website of any data type. Actions related to this data type are as follows:

IDFG Anadromous distribution data remained unchanged during the year. However, some initial progress was made in developing related data sets for traps, weirs and diversions. The traps and weirs data were completed and are attached to LLIDs and measures. Work will proceed in 2002 to convert to the Data Exchange Format and deliver to PSMFC. The diversions data set is very sparse and can be considered preliminary at best. Much work remains, but diversions are currently considered a low priority data set at current funding levels.

ODFW Significant progress was made on development of several data types under this task during FY-2001. Generally speaking, progress was made on all components that were targeted.

New data entry interfaces were developed for the Oregon barrier database to address all required data related to barriers (including culverts), dams, and hatchery facilities. A number of barriers were added to the database, with particular focus on those in the middle and upper Columbia watersheds.

Fish distribution and documentation data sets were enhanced using information from various sources, including ODFW's Aquatic Inventory Project, BLM, and USFS. Distribution data at the 100K scale were enhanced by an effort to develop 24K fish habitat distribution data in Oregon, the results of which will be available during FY-2002.

Fish barrier data were improved for NE Oregon. We refined our automated approach for populating the fish barrier database using the distribution and barrier data sets.

New records were added to our Fish Presence Survey database, which is used to improve our distribution and documentation databases. This effort would benefit from additional funding, as it appears that we have close to 1,500 data forms left to enter but no resources with which to do it. Once the existing forms are entered, we will be able to provide replicate copies of the database to ODFW field staff who will then maintain and add new data to the database.

The structure of the Incidental Fish Observation Database, which is also used to enhance the distribution and documentation databases, was enhanced this year. However, efforts to submit new data to StreamNet were prevented by budget reductions. Fortunately, the Oregon Plan paid to have more field books produced that we hope will result in increased usage of the database during the next fiscal year.

WDFW In response to data needs stemming out of Corps of Engineers dredging project in the lower Columbia River, WDFW staff updated chum salmon and smelt distribution and use data, then provided maps for the final impact report. In addition, the Rolling Review process for the Columbia Plateau province unearthed gaps in the distribution/use data for Yakima steelhead and salmon runs. Regional WDFW staff worked with other province data sources to integrate new information. Final maps will be used to update the data we exchange with the StreamNet database at the Regional level once they are delivered by the Washington Conservation Commission.

Region Regional staff assisted with an ODFW barriers mapping project by creating maps that showcased information from the StreamNet barriers data set in conjunction with other barriers information from ODFW. This project resulted in an effort to consolidate all of the barriers information into the StreamNet database.

While working on a database for barriers to fish movements, we found that precise definitions were lacking for the terms "barrier" and "partial barrier." Because definition of these terms is central to the understanding of this data type and for creation of these tables, we researched the usage of these terms. We determined that the term "partial barrier" was used in a wide variety of ways, and that almost nobody defined the term as they were using it. We concluded that for the StreamNet database we would limit our codes to just "complete barrier," meaning no fish of the species ever passes, and "partial barrier." For partial barriers we will describe exactly what is meant in a comment field. In the future, a classification of these barriers may be possible based on the information in this comment field.

We attempted to reconcile the four states' fish and fish habitat distribution databases so that a regional database could be created. This data category, though on the face of it very simple, is proving instead to be a very difficult type of data to reconcile between agencies. While each state collects data related to fish distribution, habitat use, the probability that fish are present in a reach, unoccupied habitat, and other related information related to fish distribution, each state uses different definitions and has a different data structure. These differences are proving very difficult to reconcile, and we were unsuccessful this year in creating a unified database.

During this fiscal year, we also attempted to address the concepts and definitions related to where fish species were located in the past. Often referred to as "historic distribution" or "native range," we found that there are actually at least two concepts referred to. The first concept is that of original distribution before human influences affect species distributions. The other concept is a listing of where a species was ever present, even if placed there by humans. In addition to this issue, we were unsure of the scale at which to report the "range" that a species occupied by stream reach, by stream, by HUC, etc. Teasing apart these definitions and determining which are of most importance was dropped this fiscal year in favor of other work that was more pressing.

SubTask 1.b Adult Abundance, Anadromous

Escapement, redd counts, trap counts, dam counts, hatchery returns

Adult abundance data are key to determining population changes and survival. These data were a primary focus of data development efforts in FY2001:

CRITFC Staff assumed responsibility for updating the dam count data, since these can be obtained from one or a few central locations. As part of updating these trends, staff will evaluate additional products, which may be feasible to add to the StreamNet web site.

FWS Information for all National Fish Hatcheries in the Columbia River Basin was incorporated into USFWS CRiS database. Data was then transformed to the StreamNet data exchange format and sent to StreamNet in June.

IDFG Staff completed data entry into the internal IDFG data management system for the year 2000 redd count data from IDFG. We also transferred existing hatchery return data into the internal data management system. During this process, the data georeferencing was migrated from river reach number to LLID and measures. Using a custom computer program, we began error checking and correction of the migrated hatchery return data.

A thorough review of IDFG redd count transect locations on LLID was completed for 1989-1992 and 1996-2000 redd counts. This process involved the creation of a computer application that allowed side-by-side comparison of original location data with LLID-based locations. Each transect had to be viewed individually and adjustments were made as necessary. An ArcView application was created to add GIS support for locating transect locations.

One of our biggest milestones in the development of our internal data management system was accomplished with the implementation of SPAWN, our spawning ground computer program for use by IDFG field biologists. Researchers in the Idaho Supplementation Studies used SPAWN to start entering 2001 redd count data directly into the internal database. The next step will be to create the automated conversion to the StreamNet Data Exchange Format.

We made some initial progress in developing related data sets for traps, weirs and diversions. The traps and weirs are now complete and are attached to LLIDs and measures. Work will proceed in 2002 to convert to the data exchange format and deliver to PSMFC.

ODFW All Oregon Adult Abundance data trends (where updated data were collected and made available to Oregon StreamNet) were updated and submitted to the regional StreamNet database.

Abundance data trends were updated through 1999.

Many trends were updated through 2000.

A number of new trends were added this year.

Some coastal trends were also updated, but most were not. In prior years we were able to provide a few thousand coastal trends to StreamNet using funds from outside contracts, but those funds are no longer available. This makes it appear that the StreamNet database is out-of-date and not being maintained. If support to maintain and update these trends is not identified soon, these trends may have to be removed from the StreamNet system, or at least footnoted that no efforts are being made to maintain trends outside the Columbia Basin.

Oregon hatchery return data were updated and submitted to the StreamNet database late in the year. Progress was delayed because our database manager position remained vacant for much of the year. Fortunately, we were able to hire a very capable person who quickly learned Oregon's Hatchery Management Information System (HMIS) and was able to automate a process to extract the necessary data from the System.

WDFW While compiling hatchery returns data across the years, WDFW StreamNet staff discovered that Hatchery Division staff had failed to modify their main data set when errors were discovered, modifying only a derivative table that went into their annual report. This required a major review of past years' Washington hatchery returns data, as well as an in-depth assessment of existing processes and potential improvements. WDFW StreamNet staff have offered programming and data management assistance to the Hatchery Division in order to permanently improve their processes, but no official agreement has been reached yet. Hatchery returns data were exchanged with StreamNet in Oct. and Dec. 2000. Re-worked 1995-2000 hatchery returns data will be ready to exchange with StreamNet early 2002.

Natural escapement data compilation work focused on entering 1999 and 2000 updates for lower river salmon species, filling data gaps in other years and correcting data contradictions or format discrepancies for all anadromous Columbia river species. For the first time, data gaps for mid-Columbia stocks were filled with receipt of "new-to-us" data from regional biologists. We also began work to migrate steelhead information from the complex Steelhead Resource Inventory system of spreadsheets into StreamNet exchange formats to improve the process for steelhead data exchanges. It is more complex than anticipated and our steelhead manager could not commit to any support at this time. The effort may be renewed next year.

Region The responsibility for maintaining mainstem Columbia River Dam Count data in StreamNet was taken on by the Columbia River Intertribal Fish Commission and several years of Dam Counts were appended.

Objective 1 Data Development

SubTask 1.c Juvenile Data, Anadromous

Sample records, abundance indices (as available)

Data on juvenile anadromous salmonids, including smolt outmigration data and population surveys, are scattered throughout the fish and wildlife agencies in the basin and are not readily available. While this is seen as an important data type, progress toward obtaining and standardizing these data has been slowed by the unorganized and scattered nature of the data and by other work priorities. Work accomplished this year includes:

IDFG Another major milestone for us was the development and implementation of JTRAP, a computer program and database for juvenile trapping operations in IDFG. Initial implementation and testing was by Idaho Supplementation Studies during their 2001 field season. Our StreamNet data manager assisted in the error checking and summarization of these initial data.

ODFW Oregon was forced to drop this task due to project budget cuts. Some juvenile data were identified, catalogued, and filed in the event StreamNet is able to address this data type in the future. StreamNet will also need to finalize a data exchange format for any juvenile data to be provided to the regional system.

Objective 1 Data Development

SubTask 1.d Harvest, Anadromous

In-river, terminal, and other harvest, as available

Sport harvest data are primarily obtained from catch card data in each state, while marine harvest data are obtained primarily from regional management groups. Specific efforts this year included:

CRITFC Staff assumed responsibility for updating marine harvest data since these can be obtained from one or a few central locations. As part of updating these trends, we will evaluate additional products, which may be feasible to add to the StreamNet web site.

ODFW No work was performed on this task during this year. ODFW's Fish Division has been slow to update it's harvest records and therefore we are forced to wait for these updates to occur before any new data can be submitted to StreamNet.

WDFW Work was done to standardize and share spatial codes for the polygons that comprise recreational and commercial salmon fishing areas in Washington state. In addition, mark recovery data from lower river tributary sport salmon and steelhead fisheries were compiled, standardized, and provided to the staff who generate the final sport harvest estimates. As we help the freshwater sport harvest estimate team to standardize the attribute codes they use (such as location), their database will become easier to convert and exchange in StreamNet formats. We hope to pursue this further next year.

Objective 1 Data Development

SubTask 1.e Hatchery Production, Anadromous

Releases and disposition

FWS Fish release information was received from National Fish Hatcheries in the Columbia River Basin and incorporated into the USFWS CRiS database. Coded-wire tag records were used to add information and produce a data file in PSC format 032. This file was sent to the USFWS Western Washington office in August.

IDFG Work on this subtask was inappropriately placed here in the Statement of Work. Refer to Task 1.b for work on hatchery returns. We conducted no work on hatchery releases and disposition this year.

ODFW Oregon's new database manager was hired during the latter part of the third quarter. We were able to download the required data and submit it to StreamNet, but more importantly, we were able to develop a means of accessing and retrieving data from HMIS without having to rely on other agency staff. In past years, data delivery to StreamNet has been delayed because other non-StreamNet ODFW staff have not been able to respond in a timely manner to requests for information. Return data were submitted but disposition and egg-take information were not included because StreamNet needs to agree on a new data exchange format for this information.

WDFW Staff (not StreamNet) provided 2000 and 2001 hatchery release data to PSMFC in PSC format. Staff worked together internally to cross-reference PSC release location codes to the LLID-plus-measure approach StreamNet is using. We also made progress toward our future goal of providing "unrolled" release records directly to StreamNet. We will accomplish this by modifying the same system we now use to generate PSC "rolled-up" release data. Initial assessment has taken place, and we hope to test this new capability early in 2002.

Region In the past the Regional Mark Information System (RMIS) hatchery production database was acquired, modified into Trends and mapped to EPA River Reach Codes. Routines built to convert the Pacific Salmon Commission's Data Format 032 into StreamNet's DEF 99.1 don't work to produce data in the current StreamNet DEF 2001.1 based on LLID (stream identification codes derived from the Longitude and Latitude of the stream's mouth). A PSC Location Code to LLID conversion table needs to be created. Many PSC combined-location supercodes are required by the Coded-Wire Tag release data in the RMIS system. The PSC Code to LLID conversion process will be more accurate and the resulting information much easier to map if unrolled release data can be provided to StreamNet either in PSC Data Exchange Format or in StreamNet DEF. This was proposed in this fiscal year, but the state agencies that provide data have not all agreed to accomplish the additional unplanned work to convert the last major data category from River Reach codes to the LLID coding system.

Objective 1 Data Development

SubTask 1.f Natural Production, Anadromous

Survival, production factors, spawner recruit

Despite the apparent value of this kind of data, the state fish and wildlife agencies do not routinely calculate them. The StreamNet project is dependent on the data developing agencies for their information, so little work was done on this data category this year.

IDFG We coordinated with IDFG personnel regarding survival/recruitment data. It was determined that other key data sets had higher priority to make them current in support of this category.

ODFW Progress was made to compile hatchery-wild fraction information for spring and fall chinook populations in the Columbia Basin, but no natural production data of any kind were submitted to StreamNet during this contract year.

Plans to acquire and submit spawner-recruit data were postponed due to budget cuts. It appears at this point that no one in Oregon is generating spawner-recruit data beyond what is already in StreamNet. As resources become available, efforts will be made to capture any remaining data that were developed by PATH but are not yet included in StreamNet.

Objective 1 Data Development

SubTask 1.g Age, Anadromous

Age/sex composition for returning adults

Even though attempts are being made to refine the format of age data and improve the mechanism for relating age data to Hatchery Returns data, the first age data were loaded into the StreamNet database this year.

FWS Age composition information by both age and sex was added to the USFWS CRiS database. These data were transformed into the StreamNet DEF and submitted to StreamNet in March.

IDFG In conjunction with our hatchery return data, Task 1.b, we filled in data gaps and transferred our existing age data to our internal data management system. During this process, the data georeferencing is migrated from river reach number to LLID and measures. Using a custom computer program, we began the error checking and correction of the migrated age data.

ODFW This task was dropped due to budget cuts.

WDFW While some of the age data sets were updated this year, exchange of age data with StreamNet was stalled by the discovery of some format inconsistencies and unforeseen issues raised by USFWS staff while attempting to exchange data. The issues are on track to be resolved next year.

Objective 1 Data Development

SubTask 1.h Genetics, Anadromous

Areas where genetics data exists and the sources of these data

Genetics data are of interest in the region, but so far have not been acquired or standardized region-wide. These efforts are still preliminary.

CRITFC Staff obtained existing genetic databases from NMFS and CRITFC for review and database design. After talking with several researchers in the field we determined that the genetics field and lab techniques are evolving very rapidly. This presents two problems for sharing this information in a regionally consistent manner. First, databases are evolving rapidly with new types of genetic data being developed almost daily. A single database format will not fit all data and will be obsolete in a short period of time. Second, because the field is rapidly evolving, interpreting the data requires a significant amount of explanation by the researcher before data can be properly used by another person. These problems make sharing primary genetic sampling data impractical through the StreamNet system.

A second approach, providing a catalog of available genetic data, was evaluated. A prototype application was developed and circulated to interested Steering Committee members. This prototype allowed users to search for genetic information by fish species, life stages, location, types of genetic analyses performed, and researcher. Contact information was provided for users interested in obtaining the associated primary genetic information. Maintaining a catalog of genetic studies and available data does seem like an approach which can be maintained on the StreamNet system.

Finally, the prototype catalog database was linked to primary genetic data owned by CRITFC. A user can locate data of interest in the catalog and display the primary data by clicking on the link. This was a "proof-of-concept" application for future consideration should there be significant demand for this type of service.

IDFG The SPAWN program for redd and carcass counts in part of our internal data management system (see Objective 2, Task 1) was designed to link to the genetic sampling data in the IDFG genetics database.

ODFW No work was planned for Oregon regarding genetics data during this fiscal year, but progress was made to develop genetic origin and present production standards and definitions as part of Oregon's 24K fish habitat distribution development effort. These standards and definitions will be submitted to StreamNet for consideration once they are agreed upon within Oregon.

Objective 1 Data Development

SubTask 1.I Populations, Anadromous

Population delineation, as determined by others

No work was done on this subtask this year. ODFW dropped this task due to budget cuts.

Objective 1 Data Development

SubTask 1.j Historic Range, Anadromous

As available at the watershed-level. Compilation at the reach level is an option if these data are available

Oregon reviewed and commented on several proposed definitions of historic distribution, including definitions currently being used by others outside of StreamNet. Resolution of an agreed upon historic distribution definition was delayed as the discussion broadened into a larger discussion regarding overall distribution-related definitions. The issue of standardizing distribution definitions will be addressed next year.

Task 2 Resident Fish and Other Aquatic Species

Acquire data sets related to resident fish species, and where specifically identified other aquatic species, from the multiple agencies, tribes and organizations within the Columbia Basin and compile and maintain them in standardized, consistent formats for the following categories:

In the past, data on resident fish species have been of a somewhat lower priority than anadromous fish due to lesser sport/commercial interest and the fact that funding for the StreamNet project came from the anadromous fish placeholder. Montana Fish, Wildlife and Parks has been the primary state working with resident fish data. Interest in these species is growing, however, due to the recognized sport fishery value and increased ESA concerns. Later in this fiscal year the NW Power Planning Council gave the project direction to increase emphasis on resident species. As a result, we began to place greater emphasis on resident species toward the end of the year, and are increasing emphasis next year.

SubTask 2.a Distribution and Life History, Resident

Document species occurrence and distribution and life history characteristics

Development of resident fish distribution information was elevated in priority based on the increasing regional interest on resident fish species. In addressing this data type, however, it became apparent that habitat use and occurrence definitions for anadromous species were not completely adequate for use with resident species. We began work on developing a standard list of definitions for all species, but found that there are significant and important differences in how these data are defined and managed in the individual states. As a result, more effort will be required next year to resolve the definition issues before we will be able to present seamless regional distribution information for these species.

IDFG Using the Fisheries Reference Package and the Collecting Permit Program developed by IDFG/StreamNet, IDFG Fisheries staff continued to enter fish distribution information from historic collecting permit reports into our internal data management system. Once a fish distribution data exchange format is agreed upon by StreamNet, these data will be ready for transfer to PSMFC.

We provided support by development of data entry interfaces and GIS applications to a joint BLM/IDFG project compiling existing data from regional and district offices. IDFG personnel visited several regional offices this year and collected existing electronic and paper records of fish occurrence. These data are being input into our IDFG/StreamNet internal data management system and will be incorporated into future StreamNet submissions. The project is funded for at least one more year, and eventually each regional office will be visited.

MFWP Staff completed the conversion of distribution data for all fish species to measures using the routed hydrography from PSMFC in western Montana and the NHD in eastern Montana. These data were collected from biologists in FY2000 and had been waiting for the hydrography conversion to take place to enter in MRIS. Bull Trout and Westslope Cutthroat Trout distribution were updated from genetic maps and from table edits sent to biologists in 2000. We completed fish survey edit/entry for Federal and consulting biologists to provide for easier incorporation of their fishery data. We provided all distribution data in the proposed DEF to StreamNet for inclusion on the StreamNet website. Although the Origin field is not currently part of the DEF, we began to populate it from data collected from FWP biologists. We determined that distribution and survey data need to be updated annually and will begin the next update in December 2001. A major effort this year was to relate references to each distribution and survey record in the database. The FWP Fisheries Division Library was used extensively and we also collected new reports from biologists in the field as we updated the data. The data are now current for all of Montana except for the southwestern part of the state.

We collected and cataloged supporting references to document distribution and connect distribution to reference. We still need to attach data to a DJ report when possible. References were associated with distribution for records that were reviewed in 2000

We explored the development of a standard field survey form to be used by state and federal biologists to record occurrence information. We completed the database structure for Federal and consulting biologists that will be required as a condition of a state collector's permit. This might make a survey form a moot point for these biologists as we will then get the data in our required format.

We continued to work with regional StreamNet staff and the Steering Committee to develop/modify/add to a resident fish data exchange format. We decided to use the current Distribution DEF and Montana will continue to modify their existing data structure to better fit the StreamNet existing DEF.

ODFW Work was completed or significant progress was made in all work elements that were targeted. Oregon resident fish distribution layers were created (Redband, resident O. mykiss) or updated (Bull trout). Development of fish distribution and documentation data sets was initiated for coastal and Lahontan cutthroat trout.

WDFW The statewide bull trout distribution and use data update was completed in late spring, 2001. This update involved more WDFW staff than ever before in reviewing and extending existing bull trout data. Dozens of biologists from tribal, federal, and local entities participated as well. Extensive data review and correction took place, and documenting of both main data contacts and "others" who participated in the mapping exercises was formalized to the greatest extent ever. Problems arose during attempts to convert the data to the existing StreamNet Dist_Use and Dist_Presence formats. This led to a Project-wide review and update of the fish survey and fish distribution/use data exchange formats, one that for the first time incorporated nuances from both anadromous and resident populations. Format drafts went through several revisions and were a key topic at three of the Steering Committee meetings. Finalization of the formats is expected in early 2002, with data exchange to follow immediately afterward.

Objective 1 Data Development

SubTask 2.b Adult Abundance, Resident

Escapement, redd counts, trap counts, dam counts

Abundance data for resident fish species are often collected differently than for anadromous species. While some abundance data are being captured from the fish and wildlife agencies, more work is needed on developing regionally standardized data exchange formats for all such data.

IDFGD The Fisheries Reference Package, Collecting Permit Program, and the joint BLM/IDFG data compilation projects discussed in Task 2.a are obtaining abundance data when available. We will continue to compile these data until we have a StreamNet data exchange format.

MFWP We entered 2000-2001 stream fisheries survey data collected from the biologists in FY-00 for population trends including genetics and escapement, redd counts, trap count and other counts. We completed data entry for the entire state except southwestern Montana. We collected a reference for each survey but still need to attach these to the DJ reports when they become available. We were not ready to provide these data in data exchange format to regional StreamNet staff; and will complete that task early in FY-02.

ODFW All Oregon Adult Abundance data trends (where updated data were collected and made available to Oregon StreamNet) were updated and submitted to the regional StreamNet database. Abundance data trends were updated through 1999. Many trends were updated through 2000. A number of new trends were added this year through a directed effort to acquire data associated with BPA funded resident fish projects.

Objective 1 Data Development

SubTask 2.c Angler Use, Resident

Fishing pressure, creel census

MFWP was the only project to work on this subtask this year. They added the FWP 1999 angler survey data collected by MFWP mail survey to MRIS and updated the website with the information. They reviewed all the available creel census data on Montana's waters and determined that these data are infrequently collected and that a DEF is not necessary from their viewpoint. ODFW dropped this subtask due to the budget cuts experienced by the project this fiscal year, and it was not reinstated when the budget was adjusted later in the year.

Objective 1 Data Development

SubTask 2.d Hatchery Production, Resident

Hatchery production (releases and outplants) for salmonids

Hatchery production for resident fish represents a large amount of data that are currently not included in the RMIS database, which has been the primary source of anadromous production data in StreamNet. Thus, development of these data requires new work to obtain and location code the data and complete a data exchange format (DEF) among the states. Work is beginning on this, but it will take some time under currently available staff and budget to fully develop these data.

FWS Current resident fish planting information was added to the USFWS CRiS database.

IDFG Idaho Fish and Game has historically used a water body identification system called Catalog Numbers to which all past stocking data are tied. In past years, IDFG/StreamNet identified the Catalog Numbers for all lakes. In 2001, we began to identify Catalog Numbers for streams and build a cross reference to LLID and measures. We completed approximately 90% of the work before budget limitations and higher priorities forced us to shift to other tasks. The remaining Catalog Numbers are typically numbers that were difficult to locate or otherwise did not match up with our current hydrography.

MFWP Staff began the update of the Montana Hatchery Facilities database during this fiscal year but were delayed by a very slow review process. Outplant data are available for Montana on an annual basis and will be on the MRIS website; there has been discussion of these data but there was not a request from the Region for the information. There is not a DEF completed for resident fish outplants.

ODFW Oregon was forced to drop this task due to project budget cuts.

WDFW Work to standardize historical and current resident fish stocking data was stalled by the amount of work needed to address location code issues, especially the completion of a 24K lakes layer. The water body codes used for lakes have to be coordinated with the Washington Departments of Ecology and Natural Resources, and the slow pace of that work led us to postpone significant progress on our lakes database (and thus these data) until next year.

Objective 1 Data Development

SubTask 2.e Genetics, Resident

Areas where genetics data exists and the sources of these data

Genetics of native populations is growing in importance for determining species or subspecies distribution and for determining purity. At present, only MFWP is working with genetics data. While all states recognize the value of having a primary source of genetic information, there is no regional DEF yet, so progress on developing these data will be slow.

MFWP For this fiscal year, MFWP kept the genetic spatial and tabular databases that contain the results of genetic analysis of populations of Montana's species of special concern up-to-date. Records were updated quarterly. They had created an edit/entry program to assist the University of Montana's Wild Salmon and Trout's Genetics Lab with data entry, and modified the program during the year at the lab's request. Even though there have been personnel changes at the lab, the cooperative relationship has been a total success and only gets better with time as the procedure becomes more a part of the way they do business. As data were received from the lab MFWP StreamNet staff checked and entered them. Distributions changed as a result of the genetic analysis. We have provided the data and the data structure to Phil Roger who is working on a regional genetics database. This is exciting news for Montana and we look forward to exchanging our data with the region.

Objective 1 Data Development

SubTask 2.f Population, Resident

Population delineation, as determined by others

MFWP was the only state StreamNet project to work with population data this year. They maintained and updated the spatial delineation of bull trout populations, core and nodal habitat, and finalized westslope cutthroat trout priority areas as part of the Westslope Cutthroat Conservation Agreement. They provided both of these layers to the StreamNet database. They discussed enhancing the layers with a population risk field but have abandoned the idea. A field such as this would have to be continually updated as conditions change in the field; and they do not have the ability to do that level of field monitoring. They will delete this task from next year's work statement.

Objective 1 Data Development

SubTask 2.g Historic Range, Resident

As available at the watershed-level

Determination of historic range for resident species has been a low priority. Recently, The Nature Conservancy (TNC) developed information on native range for native species for each state by Hydrologic Unit Code (HUC). StreamNet intends to use this information as a starting point. This year, MFWP reviewed the TNC historic distribution of Montana's native species by reviewing maps of each species that included the TNC data, MRIS current distribution, and data from a review of historic documents. They made modifications to the layer based on this review and further refined the layer by documenting MRIS current distribution through a literature search of documents in the FWP Fisheries Library. They have coordinated development of a Data Exchange Format for StreamNet by working with a Steering Committee subcommittee with the decision made by the Steering Committee to abandon the dissemination of Nature Conservancy's database by StreamNet and the maintenance of this layer as part of StreamNet. Montana will continue to maintain their coverage at the HUC level and will go to a finer resolution where data allow.

Objective 1 Data Development

SubTask 2.h Status, Resident

Population stability index

No work was done on resident fish status data this fiscal year

Objective 1 Data Development

Task 3 Habitat

Acquire data sets related to fish habitat from the multiple agencies, tribes and organizations within the Columbia Basin and compile and maintain them in standardized, consistent formats for the following categories:

The growing focus on watershed based management and restoration is increasing emphasis on fish habitat related information. There is a growing need for this diverse data category. However, there are no consistent habitat monitoring programs or protocols among the basin states so far. Thus, our data development efforts for this data category are still in the early development phase.

Objective 1 Data Development

SubTask 3.a Stream / Watershed Habitat

Incorporate applicable stream and watershed level habitat and stream survey data, as these become available

Stream habitat survey approaches differ in intensity and approach among the basin states. Initial efforts with these data involve simply capturing, understanding and georeferencing what data are available. These data are complex, and there needs to be regional agreement on what parameters should be measured, basic methodologies, and data standards. Until then, our efforts will focus on making what data do exist as available as possible.

IDFG With StreamNet coordination, IDFG personnel began to tie General Parr Monitoring locations to LLIDs and measures. However, budget limitations and higher priorities prevented us from completing the migration of GPM habitat data to StreamNet.

MFWPWe have standardized the collection form for genetic samples in the field and created and standardized several sets of codes that have been integrated into the regional level survey forms. We have been working with the Bozeman office of the Fisheries Information Services Unit to see where we can standardize other coding. These data end up in a variety of databases so we have not needed/encouraged a data exchange format.

Region Staff georeferenced the ODFW Aquatic Inventory Project reach-based habitat stream survey data to the 1:100,000 scale LLID hydrography as an exploratory step to including this information in the StreamNet database. They did not conduct further work on this due to higher prioritization of other tasks.

Objective 1 Data Development

SubTask 3.b Habitat: Water Quality

Incorporate existing Clean Water Act 303(d) data and other water quality data as applicable

Water quality is generally under the purview of agencies other than the fish and wildlife agencies. StreamNet has focused on capturing water quality data from those other sources and making them available so they are georeferenced and compatible with fisheries data in the same areas.

MFWP 303(d) (TMDL) data and the Army Corps of Engineer (ACE) stream permitting database for Montana was made available on line through the Natural Resource Information System Thematic Mapper as well as it's own stand alone database through the Department of Environmental Quality and NRIS, respectively. The NRIS Thematic Mapper allows TMDL data and the ACE database to be viewed with Fisheries data and be queried for sub-basin planning.

Region Staff finished conversion of 303(d) information to the 1:100,000 scale hydrography and posted this information as downloadable data on the StreamNet web site. They used this data for overlay with fish distribution data to depict where water quality impaired stream reaches directly relate to individual fish species.

Staff developed a structure for stream nutrient data and incorporated the PSMFC nutrient data into the database in this new structure.

Under separate funding, we continued work from the previous fiscal year to incorporate water temperature data into the draft StreamNet water temperature database. We concluded data capture for water temperature, completing our proof-of-concept work for this data type. We found that, if logistical constraints could be addressed (mainly related to sampling locations), it would be relatively easy to create a queriable water temperature database. The remaining issues to address would be how to coordinate collection of data from across the region, and how to provide data source (reference) information for this data type.

Also under separate funding, we continued work with Oregon Department of Environmental Quality (ODEQ) to use their data to refine a regional macroinvertebrates database structure. ODEQ's data were obtained, errors were detected and corrected, sites were tied to the 1:100,000 scale hydrography, and the data were pulled into the regional database, making changes to the regional database structure as needed. ODEQ subsequently made a tentative decision to use the regional StreamNet data structure for their own database due to its ability to prevent errors. It is hoped that this effort will soon lead to creation and use of a region-wide macroinvertebrate database that will be useful for research into macroinvertebrate-habitat quality research and for management.

Objective 1 Data Development

SubTask 3.c Miscellaneous Habitat Data

MFWP Staff organized two meetings to discuss the Montana GAP Land Cover Type spatial layer with other members of the GIS community during the fiscal year. We discussed the creation of data layer, participants provided feedback concerning the value of the layer in various analyses and the weaknesses in the layer were identified which included riparian/wetland, sagebrush, and prairie types. The meeting concluded with assignments for participants to report back and the ball was dropped by all. The Montana Geographic Information Council is picking up the ball for all GIS layers in the state and getting "I-Teams" established that would essentially oversee each of the major data layers in the state. Work will continue in FY02. We have worked with NRCS staff to determine usability of derived slope, aspect, gradient, sinuosity data for several project areas but have not completed an analysis of their techniques on a statewide basis.

ODFW Staff provided technical support and tracked the progress of efforts to identify and/or prioritized important salmonid habitat and management area designations.

Plans to update StreamNet’s stream management area designation information were dropped due to project budget cuts.

Objective 1 Data Development

Task 4 Facilities

Acquire data sets related to fishery-related facilities and structures from the multiple agencies, tribes and organizations within the Columbia Basin and compile and maintain them in standardized, consistent formats for the following categories:

The subtasks under this task involved updating data related to facilities and structures of importance to fishery resources.

Objective 1 Data Development

SubTask 4.a Dams and Fish Passage Facilities

Enhance the existing StreamNet dams data set by updating relevant data from the Pacific Northwest Hydropower Database and Analysis System (NWHS) and the National Inventory of Dams

IDFG In previous years, we combined the National Inventory of Dams data set with the Idaho Department of Water Resources dam data set. This greatly multiplied the number of dams in the database. We also tied all these dams to LLIDs and measure. Many of the dams are located on streams not in the 1:100,000 scale hydrography database and did not get tied to LLID. We moved this basic data set into our internal data management system, but much work remains to describe and coordinate the codes from the two different sources. Budget limitations and higher priorities prevented us from proceeding further on the dams layer.

MFWP We began work on combining the StreamNet dams data set with dams named in the GNIS and the National Inventory of Dams, and nearly completed the project in the 4th quarter. Will exchange Montana's data early in FY2002.

ODFW Progress was made in several areas related to dams, including:

Staff enhanced the existing dam records with geographic location information and populated a new field that allows identification of dams that exist in 1:24K streams.

New records were added to the dam facility database.

Improvements were made to forms and other data entry features within the barrier database that are associated with dams.

WDFW Washington state dams information from StreamNet (National Inventory of Dams) and WA Department of Ecology sources were brought together and staged for comparison in order to generate a single, complete, spatially-enabled dams data set congruent with the 100K hydrography. Urgent regional need for other data sets lowered the priority of this work, postponing the comparison work until next year.

Region Staff improved location information for most Oregon dam facilities by determining the stream-based coordinates for these facilities. These results were returned to ODFW for verification.

Objective 1 Data Development

SubTask 4.b Hatchery Facilities

Update and maintain a data set on anadromous and resident hatchery facilities containing information on location, design, management and authorization

FWS Staff updated the hatchery facilities database to accommodate personnel changes.

IDFG Staff developed an initial hatchery data set and migrated it into our internal data management system. All hatcheries were tied to LLID and measures. Geographic coordinates were also calculated. The attributes, including managers, were brought up to date. Submission to StreamNet is waiting completion of higher priority data sets.

All related traps and weirs were located and a new data set developed. This data will be submitted with the hatchery data.

MFWP Staff began an update of the spatial and related ACCESS database and at the end of the fiscal year was at the MFWP Hatchery Bureau for final review. We will exchange early in the FY2002.

ODFW Progress was made in several areas related to hatchery facilities:

A significant number of hatchery-related aerial photographs were provided to Regional StreamNet during this fiscal year. We hope to provide photos for all remaining hatchery facilities during FY-2002.

Staff updated existing hatchery facility records with new information.

ODFW and WDFW worked together in an effort to resolve lingering hatchery facility data exchange format issues.

Data updated to new exchange format standards were submitted to the Regional StreamNet office.

WDFW A careful review of the May 2000 exchange of Washington hatchery facility data with StreamNet uncovered many incorrect LLID codes, revealed only by the availability of more refined spatial layer tools to identify the stream codes nearest the facilities. Previously "unknown" facilities in the Yakima River basin were discovered during data assimilation for the Rolling Review - Columbia Plateau province; these sites have been identified and incorporated into the facilities layer for the first time. The exchange of this much improved data set is delayed until early next fiscal year to confirm site locations and finalize begin foot measures.

Region The StreamNet hatchery committee created an updated exchange format for hatcheries with better georeferencing of hatchery locations and a more robust set of information for each facility.

Staff captured hatchery locations in the Yakima subbasin for a mapping request for the Yakama Tribe and submitted this information to the WDFW StreamNet project.

Objective 1 Data Development

SubTask 4.c Diversion/screening

Develop a data set for water diversions and screening

MFWP We have not done any work on this task because the Department of Natural Resources with web support from NRIS are responsible for this data set. StreamNet can access it over the web in a Water Rights program on the web.

ODFW A new database structure was developed for ODFW's fish screening and passage data and technical support was provided to Oregon Fish Screening and Passage staff as they populated the structure with new and existing information.

Plans to develop a data exchange format for fish screening and passage data were dropped due to budget cuts. If funding is available, a DEF will be developed and proposed to StreamNet during FY-2002.

Task 5 Habitat Restoration/Improvement Projects

Acquire data sets related to habitat restoration / improvement projects from the multiple agencies, tribes and organizations within the Columbia Basin and compile and maintain them in standardized, consistent formats for the following categories:

This task was broken into two subtasks in the Statement of Work, split between the Council's Fish and Wildlife Program and other agencies/programs. This distinction proved unnecessary, however, so both subtasks are combined here. Initial review of data availability indicated that, although recognized as important, most agencies are not yet developing detailed tracking of habitat projects. Efforts by StreamNet have centered around developing a draft Data Exchange Format for habitat related projects. Future efforts will focus on contacting the various agencies and entities that fund or conduct such projects to determine the most effective means of obtaining the data so that the total amount of habitat restoration and improvement, regardless of funding source, can be tracked and evaluated.

IDFG Working with regional StreamNet staff, we helped finalize the data exchange format and data entry interface for restoration project data. We performed a series of updates on the latest database and interface to update codes and values in the existing data.

We collaborated with BLM staff to obtain NEPA logs describing restoration projects. We also coordinated with the Boise and Payette National Forests to help them develop a compatible database that they will use and will provide future data to StreamNet. Within the limits of the specific funding for this task, we entered some IDFG and The Nature Conservancy project data and submitted it to PSMFC.

MFWP StreamNet staff has created and maintains an edit/entry program for restoration data that was updated by the Fisheries Division's program staff during FY-01. The location of each project is also being reviewed by Division staff. Jeff Hutten created a conversion program between MFWP data structure and the DEF and the data were exchanged to the Regional StreamNet database.

ODFW Plans were successfully addressed related to this task during FY-01.

We successfully designed and developed a database structure and user manual for Oregon's nutrient enrichment (carcass placement) effort. The structure should be used for data input during FY-02, at which time data may be provided to StreamNet.

Oregon responded to questions and issues related to restoration project data.

Examples of California's restoration project mapping and data effort were reviewed for applicability to the region, and distributed to people in Oregon who work with restoration data to solicit feedback.

Oregon was prepared to assist with the development or enhancement of StreamNet's restoration data maps, but assistance was not required during FY-01.

WDFW StreamNet staff updated documentation we maintain concerning Columbia Basin habitat restoration projects with a further review of CBFWA projects and some additional exploration of Web sites purporting to contain such data. A database (with reports) summarizing the "Internet Guide" information we compiled was provided to Stan Allen of PSMFC for review and comment. Staff also worked more closely than before with Washington state IAC staff, who maintain the largest database of habitat restoration projects in the state (PRISM). Advice was given to PRISM managers concerning changes that would facilitate our working with the database, and draft ideas for changes to StreamNet's habitat restoration formats were documented for future discussions.

Region Primary emphasis was on developing the draft DEF for this data category. We worked with the related project in California as they implemented this data category, and helped them convert the existing data input tool to Access 2000. The new edition was delivered to Nez Perce Tribe biologists for their use and eventual data submittal to StreamNet via CRITFC.

Task 6 Sub-basin Planning

Develop consistent data sets and information that are particularly suitable and useful for regional sub-basin planning and make them readily available for planners

This task (originally divided into two subtasks for providing data to the planning effort and for capturing new information generated by planning) was hampered by Subbasin Planning not being implemented in FY-01. StreamNet did develop data summaries by subbasin for use in the Provincial Review / Subbasin Summaries. We also participated in various data related meetings that addressed regional data needs for planning.

CRITFC Subbasin planning received much discussion last year but little movement toward initiation. Consequently, we did little toward providing information to subbasin planners (who weren't identified yet) and focused on getting ready to provide data services when planning begins. We led or participated in three efforts to prepare for subbasin planning. First, the Library scanned and provided, through the library web page, the reports from the 1990 round of subbasin planning. These will be primary references for the next subbasin planning effort. Second, CRITFC staff participated in development of watershed assessment and subbasin planning manuals for use by subbasin planners. These documents identify and described data management needs and services at several places in the planning process. Finally, CRITFC convened a one-day workshop with ODFW, NWPPC, NMFS, and City of Portland staffs and NGO representatives to discuss integrating OWEB and EDT tools into a single subbasin assessment methodology. Integrating these tools will lead to integrated databases.

IDFG Idaho Fish and Game personnel were deeply involved in development of subbasin summaries. In addition to the data supplied by the regional StreamNet staff, IDFG StreamNet worked closely with other IDFG staff to develop subbasin assessments. We provided fishery data in addition to the regional data, especially resident species, from our internal data management system. StreamNet staff and equipment also supplied GIS services, especially map production and analysis, although they were paid by other funds.

MFWP No requests were received. Staff contacted Montana's CBFWA representative, but he was not in need of anything more.

ODFW Oregon's participation in Subbasin Planning support primarily consisted of attending coordination meetings and providing GIS support to Columbia Gorge and Columbia Plateau Subbasin Summary efforts. Plans to review and evaluate Subbasin Summaries for applicable data for StreamNet were dropped due to budget cuts.

WDFW StreamNet staff from the Lower Columbia Regional office assisted office biologists in compiling and analyzing chum and chinook data to support the Rolling Review for the Lower Columbia province.

Region GIS staff revised BPA subbasin boundaries to fit correctly with the 1:100,000 scale hydrography and to comply with the NWPPC subbasin definitions. They used this revised GIS layer to develop cross-reference tables for delivery of StreamNet data by the new subbasins. GIS staff developed packages of StreamNet maps and GIS data for each subbasin for the Subbasin Summaries. GIS staff also produced custom subbasin planning maps for various requests from subbasin summary writers, and produced custom maps and information related to subbasin planning to the NWPPC upon request.

StreamNet produced packets of custom spreadsheets, maps and GIS layers for each subbasin under the Provincial Review/Subbasin Summary program. Each packet contained all StreamNet data for that subbasin. These packages were delivered directly to subbasin summary writers in paper and CD formats and also made available in digital format through a web-based interface on the StreamNet web site. Staff also created a map showing the differences between the 1990 subbasin boundaries and the 2001 subbasin boundaries, and posted it on a web page. This work was done partially on supplemental funding from NWPPC.

Staff began the process of modifying the database to accommodate the new Provinces and Subbasins as defined by the NWPPC.

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 meet their policy, planning, and management needs

Data management refers to the storage and manipulation of data. This occurs at the individual project level during the data development phase and to serve individual agency needs, and it is the primary effort conducted at the Region level at PSMFC. Once data development is complete and the data are provided to the Region in Data Exchange Format, Regional data management entails loading the data into the StreamNet database, managing the structure and function of the database itself, application and maintenance of various data tools (GIS, query system, website, etc.), and dissemination of the data through the StreamNet website and query system, as well as through customized data products. Major efforts in FY-01 include enhancing data delivery through acquisition of new software (ArcIMS, Cold Fusion), hiring a project programmer, and finishing up work related to the LLID data conversion.

Objective 2 Data Management and Delivery

Task 1. Database Management

Maintain functional database programs at the state and regional levels to make consistent data sets for anadromous fish, resident fish and to a lesser extent wildlife available through the StreamNet online database system. At both the regional and state levels, provide database management and administration necessary for accomplishing StreamNet objectives, to include: 1) maintaining regional and state-level StreamNet data sets, 2) processing exchange data into the regional database, 3) transporting data to the SQL environment, 4) enhancing StreamNet database structures and capabilities, and 5) providing programming services to project participants to allow for efficient data entry and transfer.

Use and maintenance of the database systems continued at all levels of the project. Staff at the Region loaded data submitted by the cooperating projects into the StreamNet database or worked with project staffs to assure that data would load smoothly Other specific activities included:

IDFG Idaho Fish and Game StreamNet staff made major progress in 2001 on our internal data management system called the Fish Information System, or FIS. The work proceeded along three lines:

First, we made good progress in migrating our legacy StreamNet data into the FIS. This required development of data tables and interfaces for data management. We also began work to enter data that has not been entered for several years because of our focus on initial system development. All data are being carefully checked for completeness and accuracy. Part of this checking included an interface and methodology to validate and correct problems in the hatchery return and redd count data. Errors included inconsistent river reach numbers, inability to georeference locations based on percent of reach, misidentified StreamNet reference numbers, and assignment of redd counts to incorrect trends based on location, species or time. We also attached LLID and measures to many of the actual redd count transacts, not just StreamNet trends. We developed a tool to view and analyze StreamNet trends. This pointed out a number of problems in trend definition which we will consider in the future.

Second, we have continued to administer the Collecting Permit and Reference modules. The Reference Module was enhanced to allow entry of redd count data. These modules have been used by non-StreamNet IDFG personnel to enter data from fisheries records. These data tables are growing fast and are proving to be valuable sources, as demonstrated in data queries for subbasin summaries.

Third, we developed a close working relationship with the Idaho Supplementation Studies (ISS), a major source of Idaho redd count data. We have developed two systems for them: 1) SPAWN, a redd and carcass count system, and 2) JTRAP, a system for juvenile salmonid trapping operations. ISS used these tools in the field during their field season and successfully transferred data via XML into the FIS.

Additional efforts resulted in development of a new database and interface for tracking our data requests. Another database and interface was developed for a joint IDFG/BLM project compiling historic fish data. While most of our work was focused on the above data development, we also began work on the administrative programs that will convert our data into StreamNet data exchange format. This focus will increase in effort as our data sets become complete.

MFWP During the fiscal year, the Information Services Unit, of which StreamNet is a part, received 1.75 permanent FTE for the GIS Services within the agency. With StreamNet, GIS and now Web Services administered by the same unit, there is even more opportunity to provide well coordinated data management services at the state level. GIS services are provided to the entire agency and allow for standards to be put in place for spatial and associated tabular data. ISU staff serves and represents MFWP on all pertinent data management committees, standing and *ad hoc*. Staff attended various meetings for coordination purposes.

ODFW Oregon StreamNet engaged in numerous efforts to modify user interfaces that aid in converting Oregon data to StreamNet format, thus creating easier data entry processes and enhancing report and query capabilities. Oregon also created new tools to increase efficiency in data capture and to centralize many of our commonly used database functions. Staff spent a great deal of time working with Regional StreamNet to resolve problems with the abundance data entry interface tool. Ultimately, a new 'interim' interface was developed to mimic the functions of the StreamNet interface so data capture and exchange could continue.

WDFW This year we took a more macro-view to assess weak areas in internal processes and StreamNet's support resources and plan to correct them. We staged some improvements or began research vital to greater efficiency, although some of these efforts will not yield benefits until next fiscal year. In general this included creation of internal tools to assess, convert or compile tabular or spatial data, engage efficiently in future exchange format discussions and sort through the pros and cons of various technology. A few specific examples are:

We now have a new internal Hatchery Returns database to link more easily between the way Hatchery Division organizes their information and the StreamNet exchange format. We also have a new internal escapement totals database. The three different spawning ground survey data sets in use by WDFW regional office staff are being analyzed right now to determine how to assimilate their most crucial attributes into a single data set, coupled with a Windows-based data entry/verification front end. This new database will be ready for trial next year, and, once fully implemented, should speed annual updates of survey data and coordination with the escapement totals database.

One of our staff spent some time in self-education on the uses of ArcView as a tool to import field sampling data, generate points based on GPS or LatLong field readings, and create simple plots that combine field data with statewide standard reference layers. Instructions for using ArcView in this way have been documented, and some handy template projects have been built to simplify the process for other staff.

Region Several database errors were reported to or discovered by StreamNet personnel. These errors were corrected as soon as possible in the central StreamNet database, with the errors also reported back to the originating agencies so that the source databases could be corrected. No major errors were found in the database this fiscal year.

The StreamNet database structure was extensively modified in order to move from the River Reach Code based data system to an LLID based system. An LLID is a simple stream identification code derived from the Longitude and Latitude of a stream's mouth and data are mapped to each LLID using the beginning and end position relative to the mouth of the stream, in feet. We also began the process of modifying the StreamNet database to accommodate the new Provinces and Subbasins defined by the NWPPC.

Failure of another hard disk in one of the old servers led to replacement of the primary server. Significant improvements in performance were obtained immediately.

Task 2. Data Plan

Update and maintain a project data plan that identifies 1) current data holdings at the regional level, 2) data items to be incorporated in the current contract period and in future years, and 3) expectations for data development and delivery from participating organizations within the current contract period

In the past, a specific data plan was developed. However, in the past two years, the detail contained in the annual work statement included more precise information on what specific data were to be developed each year. This more precise work statement, and the fact that current data holdings information is available on the StreamNet site as part of the query system, has removed the need for a specific data plan. During FY-01 a new organization of data development priorities was devised for the FY-02 work statement, which will serve as the 2002 data plan.

CRITFC Staff kept Steering Committee appraised of several regional discussions, issues and developments with implications for regional data management. These included the work of the Regional Assessment Advisory Committee, the Regional Data Management Committee, and development of the Ecosystem Diagnosis and Treatment tool. There was a lot of discussion and process surrounding these topics, but not much movement in FY01 that affected the content of StreamNet databases or data delivery services. Nevertheless, these issues will come together with better focus, one expects, when the subbasin planning effort begins.

IDFG During StreamNet Steering Committee meetings, we developed a current list of data types we are currently working on. The scope of our work was surprising to participants and we all quickly realized that we needed to prioritize specific items and push others back or even off the work plan. The result was a refocusing on traditional, long-term StreamNet data categories such as production, escapement, and distribution. Although everyone would like to have them and throughout the region they are gaining importance, data categories such as barriers, diversions, and restoration projects had to be pushed back. This is due to the finite resources provided and the inability to make them meet all needs.

MFWP We reviewed several contracts/documents that regional staff were responsible for.

ODFW Oregon's data plan was modified during the year in order to responded to a request from NWPPC to enumerate the rate at which hatchery fish are marked in Oregon. Any further activities at the state level were limited by budget shortfalls.

Task 3. Data Exchange Standards

Establish and maintain data exchange standards that ensure consistent format and content of data that originated from the multiple agencies and data sources in the basin. Included will be proposed and adopted data exchange formats, metadata and location look-up tables for specific data items as described under Objective 1. At the regional level, this task will provide technical assistance regarding standard codes and exchange formats for Fish and Wildlife Program and ESA- related projects, and for applicable tribal data compilation activities. At the state level, this task will provide similar technical assistance for state agency data activities applicable to StreamNet.

The Data Exchange Format (DEF) is the primary means used to standardize fish related data among the basin fish and wildlife agencies and enter them into the StreamNet database. Following many years of frequent changes, the DEF adopted in FY-01 now appears stable.

CRITFC Staff reviewed DEF issues as they were presented to the Steering Committee. We evaluated the Harvest DEF issues and determined they should be updated. A report will be sent to the Steering Committee after reviewing PSC, PFMC, ODFW, and WDFW harvest data collection and reporting protocols, but this may run into the next fiscal year. We presented draft genetics data DEF's to the Steering Committee for comment.

IDFG StreamNet worked on developing a new fish distribution data exchange format that would allow members to submit standardized fish distribution data. We also produced a new version of the exchange formats that contained various minor adjustments to a number of data categories. Idaho StreamNet participated in these exchange formats.

MFWP Montana StreamNet participated in development and maintenance of standard codes and data exchange formats through involvement on the Steering Committee and technical work groups. We reviewed Historic Distribution, Hatchery Facility and Barriers and developed a fish distribution DEF after much sweat and tears.

ODFW Oregon contributed to the development and review of several proposed data exchange format modifications and participated on two work groups established to address data exchange issues specifically related to references and hatchery facility data.

WDFW Washington StreamNet led the effort to improve the existing data exchange formats for fish distribution and use (Dist_Use and Dist_Presence). The new proposal was built as a team effort by Steering Committee members from Idaho, Montana, Oregon, Washington, and PSMFC. It captures the results of fish sampling in a fish survey table, while storing extrapolated fish distribution (present, presumed, potential) and use-type (spawning, rearing) information in a fish distribution table. The decisions accommodate a wide variety of information the states are expected to manage these days, particularly for stocks of fish listed under ESA. The Steering Committee is poised to make final changes and approve these new formats early in 2002.

WDFW led the effort that finalized the hatchery facility data exchange format. WDFW also drafted a revision of the hatchery returns format, and guided that draft through the comment period. Final responses from StreamNet participants for the hatchery return proposal were in conflict with each other, so some additional fact-finding was done late in this fiscal year and an improved proposal is due out early in 2002.

Basic research to support assignment of LLIDs (location codes) and Begin Foot measures was conducted for both ready-to-exchange data as well as for sites on our standard PSC site code list (for future data exchanges). Early data records which used so-called "supercodes" are being re-examined to try to tease out the specific areas involved in an attempt to provide specific LLID coding, rather than continuing the use of "invented" area codes.

Staff discovered and verified any flawed routing or stream names in both the Washington state 100K streams layers and the data set supporting StreamNet's EventMapper application. Staff will repair the stream issues next fiscal year when we organize and enable an effort to correct the stream layer.

Improvements to the "metaform" document that accompanies all exchanged data were proposed to StreamNet Regional staff, following the discovery of issues with the current document, found while preparing to exchange data. Future exchanges of spatial data will involve exchange of FGDC-Compliant metadata; we feel that clarification of the roles of formal metadata and "metadata-like" information are important to both data providers and data users, and hope to guide these proposals to successful conclusions next year.

Region The StreamNet data exchange format is no longer undergoing the significant updates and corrections that occurred during the previous several years. The document is now very stable, with only minor improvements being made to existing data types. Of course, when new data types are adopted a significant change is required in this document. During this fiscal year, Data Exchange Format version 2001.1 was adopted. It has remained in effect through the time this report was created, though small changes such as code additions are pending. We expect the next significant update to occur once the table structures used to house fish distribution data are completed. While creating version 2001.1, we did significant comparisons between the exchange format document, the SQL database tables on the StreamNet servers, and the GIS tables. A number of discrepancies were found and addressed. As a result, the exchange format document has been very stable since that time.

Task 4. GIS Data System

Establish and implement procedures for coordination of StreamNet-related spatial data activities among participating organizations, to include regular meetings and or other communication links among participating GIS specialists. Designate and maintain metadata format for spatial data to be used by StreamNet participants. Prepare map products in hardcopy and/or electronic format for use in Program-related aquatic resource policy, planning, and management. Provide for distribution of spatial data in GIS and tabular format and as GIS products.

Data in the StreamNet database are location coded (LLID) so that they can be tied and mapped to the 1:100,000 scale hydrography. Some of the data are distributed specifically as GIS layers. Each of the state StreamNet projects and the Regional office maintain GIS systems for internal data development and for data dissemination, and these systems were utilized and maintained throughout this fiscal year.

IDFG Idaho Fish and Game purchased for us a new, large file server. We moved our core GIS layers to this file server providing access to our GIS data to not just our StreamNet staff, but also the entire IDFG headquarters.

We hired a new GIS analyst to work at IDFG. Although funded by IDFG and not StreamNet, this position contributes valuable services and products that benefit StreamNet. One of the first products was an ArcView application that simplifies filling data requests. By entering locational information, ArcView automatically conducts a spatial query of our fish distribution data and creates a species list. Another application, called Fish Tools, is being used by IDFG fisheries biologists to locate and attach GPS coordinates to the StreamNet hydrography, capturing the LLID and measure. A third application is being used to identify streams that are not yet routed in the StreamNet hydrography. A list of arc numbers and stream name are saved and sent to our StreamNet staff. We then are able to add the specific routes, add names, and create new LLIDs.
We also updated our fish distribution shapefiles to include more complete and explanatory material in the attribute tables.

MFWP We completed the conversion from Unix to NT for the Kalispell office of ISU, which includes StreamNet. This was funded completely by the State. Two surplus Unix boxes were left that had been purchased with state and BPA funds. We surplused one Unix box to BPA; the other to State of Montana. We received 1.75 permanent FTE from the legislature for MFWP's GIS program which will be split among ISU staff that is also responsible for StreamNet. We had temporary FTE for the last two years for the GIS work. We reviewed current data layers that ISU staff maintains and updated the database that stores the information; we provided information to MFWP Management Team and prioritized needs for the FY. We filled 60 Fisheries related GIS map and data requests during the year.

ODFW Oregon StreamNet continued general maintenance activities associated with their GIS data system during FY-01 and began transitioning to a more Windows based approach to managing it's GIS system. We successfully incorporated new custom tools into routine data collection, development and maintenance efforts to increase efficiency. We coordinated with the Oregon Geographic Information Committee Hydro Subcommittee, the Oregon / Washington Hydrography Framework group and Regional StreamNet staff regarding 100K / 24K hydro & National Hydrologic Data set compatibility issues. Functionality of ArcView / Access was tested, refined and implemented in order to address data development needs and improve data development efficiency. Updated FGDC compliant metadata for newly created or updated 100K fish distribution data were submitted. Technical assistance and hard copy maps were provided to address several planning, management and policy development efforts.

WDFW Washington state spatial layers for 100K hydro, barriers, hatchery facilities, lakes, anadromous fish distribution/use, bull trout distribution/use, and resident fish distribution were refreshed and all event tables regenerated after a major overhaul to the agency data storage systems. Program code with path dependencies was updated and all menu choices on the data release menus were tested.

Staff began to build a database of contacts for the bull trout distribution/use data update project as the first stage in developing FGDC-compliant metadata for that layer. A formal request came from EPA for the bull trout data, accompanied by such metadata. We expect the data set and metadata will be ready early in 2002.

Region We upgraded the regional GIS software to ArcInfo 8.1. We installed and configured ArcIMS 3.0 and ArcSDE 8.0 and designed a pilot application to demonstrate Internet mapping capabilities with ArcIMS. We upgraded the primary GIS workstation to a new computer and reinstalled GIS software on primary and secondary computers after the upgrade.

The regional lakes layer was updated to include revised information from Washington and new information (previously not included) for western Montana. We added this updated layer to the StreamNet database and online system and posted it as a downloadable GIS layer to the site with updated documentation.

A GIS/Data Technician was hired to assist with the subbasin summary project and targeted projects to be completed with available funding.

We rewrote all anadromous distribution and other metadata (documentation) to the Federal Geographic Data Committee (FGDC) format for better utility and to comply with federal metadata standards. We submitted these metadata for inclusion at the USGS National Biological Information Infrastructure (NBII) clearinghouse so that StreamNet data will be available for use through this national clearinghouse.

We continued to make improvements to the spatial component of the StreamNet database.

GIS data and map products were prepared from StreamNet data, as needed. Staff responded to all requests from the public and prepared GIS data, maps, and other information or products for 133 public map or GIS-related requests.

Staff revised the online map catalog to remove outdated maps and added 323 new StreamNet maps to the catalog.

Staff finished determination of stream flow information for all 1:100,000 streams in order to improve online identification of streams.

We reviewed and incorporated updated ODFW anadromous distribution data into the StreamNet database, online system, and as downloadable GIS files with revised documentation. We also reviewed and added a new data set of fish distribution sightings from ODFW to the database and revised a database application for use in aggregating total fish distribution in selected areas.

New resident fish distribution data from MFWP for 18 species were reviewed and added to the StreamNet database, online system, and as downloadable GIS files with accompanying documentation. An update of Lahontan cutthroat trout and redband trout distribution data from ODFW were incorporated into the StreamNet database, online system, and as downloadable GIS files, along with updated documentation.

Objective 2 Data Management and Delivery

Task 5 StreamNet Internet Site

Continue to maintain and enhance the existing client-server system to provide access to StreamNet data products through the Internet. The StreamNet home page will continue to be recognized as the project's primary data delivery vehicle. Priority will be given to incorporating data developed through Objective 1 and providing access to reference materials secured through Objective 3. Appropriate training on the use of the system will be provided through a combination of on-line help and in-person training sessions.

This task included two subtasks for enhancing the web site and maintaining the client server system. This is an ongoing responsibility and was addressed throughout the year. While largely a Regional responsibility, the individual projects also maintained their respective computer systems and assisted the Region through input and review of improvements to the main StreamNet web site.

CRITFC Staff developed and implemented a library web page to improve and expand services to library patrons. This feature allows patrons to search the library catalog online and retrieve electronic copies of a growing number of documents. Web page implementation continues to evolve as it is integrated into the entire StreamNet system.

Staff met with Drew Parkin to determine the library information needs for the NPPC's subbasin planning efforts. The primary need was for a core set of technical documents that provide basic technical information for each subbasin. Laurie Nock and Lenora Oftedahl reviewed bibliographies and began assembling target lists of materials to be digitized. We also jointly determined the order that the 1990 subbasin plans would be scanned and turned into PDF files. These plans were scanned and were added to the Library web pages on Subbasin planning. We began capturing and storing the new plans and documents from the CBFWA website so that all the relevant documents on a subbasin can be linked to from one page. We also began developing pages for each subbasin to list the documentation. Full implementation of these features will require additional funding for a technician to do the scanning and create pdf files for the web page.

IDFG Staff participated, primarily via Steering Committee meetings, in the review and design of the StreamNet website.

MFWP Staff reviewed the new website for StreamNet regional staff.

ODFW Staff provided feedback on several StreamNet website changes / enhancements. They surveyed people who download GIS layers from the ODFW web site on how they use the data and how to improve service. Fish distribution data is used for ESA-purposes, education, watershed / biological assessment / analysis, determining harvest locations, and conservation site selection / prioritization. Suggestions include making fish origin (hatchery vs. native) available and to allow download of all anadromous species distribution at once. Users commended the thoroughness of metadata and available data field categories.

WDFW Washington StreamNet staff regularly provided written feedback to Regional staff at PSMFC regarding changes to the Online Database System, including Query System improvements, the new Online Users Document, and the "new look" of the Web site. Extensive use of the EventMapper tool resulted in a series of proposals for changes sent in writing to PSMFC StreamNet staff.

Region A number of web site improvements were made during the year. We created a user's guide for the on-line query system. The user's guide will allow people to follow along with a pre-made example query, letting users see all aspects of the query system from start-up through data download.

A large number of web pages on the StreamNet web site were updated and corrected for minor errors or incorrect hypertext links.

The on-line query system was improved during this fiscal year. Difficulties related to the switch from RRNs to LLIDs were still occurring, and these were identified and addressed. By the end of the fiscal year the query system was very stable and all of the most significant errors were corrected.

We researched possibilities for creating "StreamNet News," an email list that would allow us to inform StreamNet users of significant changes in StreamNet. Although several options were scrutinized, none offered the features we desired. We continued to search for other options for this functionality to the StreamNet web site.

A full-time programmer was hired this fiscal year. Having a full-time programmer will allow for improved functionality of the query system, much shorter response times in fixing problems, and improved flexibility and programming capabilities for a variety of needs. This person was hired late in the fiscal year and was still being trained when the year ended.

A new database server was obtained and configured, and the StreamNet database was moved onto it. This computer is a significant upgrade from the failed server it replaced, and StreamNet on-line queries now run significantly faster. In addition, the query system is now significantly more stable, making it more available with less down time.

Task 6. 1:100,000-scale Hydrography

Maintain the 1:100,000-scale PNW hydrography for purposes of attaching StreamNet data. Coordinate with efforts to prepare a National Hydrographic Dataset (NHD). Develop a standardized method for incorporating lake hydrography and attribute information.

The StreamNet project is the primary entity responsible for maintaining the regional 1:100,000 scale hydrography, and the project was also involved in providing data to complete the NHD. In FY-01 efforts to maintain and update the hydrography continued.

IDFG We collected a small set of additional routes to add to the StreamNet hydrography as well as a few needed corrections. These changes have not yet been made.

IDFG StreamNet GIS staff performed a comparison of StreamNet hydrography to the National Hydrography Dataset (NHD). Using our own data, we attached fish distribution events to each and plotted out the results. We found that we got almost identical results. The major difficulty was in lakes and reservoirs that have connector arcs to tributaries. In StreamNet, the tributaries are routed all the way to the centerline in the lake, resulting in the measures starting at the centerline. In the NHD, tributaries are identified starting at the shoreline. As a result there is some mismatch. A solution can probably be found with further work, but this provided an adequate test for now.

We participated in meetings to develop 1:24,000 scale hydrography in Idaho. No work has actually begun, but the meetings are laying the groundwork for eventual new hydrography.

MFWP NRIS received a grant to provide the maintenance/enhancement to the NHD for Montana. We have coordinated closely with NRIS staff in its work on the NHD and the lead person has changed from Jeff to Steve since he is here in Helena. NRIS staff has quality checked all stream names in the coverage. We have completed the conversion of Montana hydrography to NHD with eastern Montana built on NHD and western Montana still based on the PNW. We have enhanced the layer with LLID and stream level routing and converted all MRIS data to routed hydrography. StreamNet regional staff has assisted in the process of assigning LLIDs and other quality checking. We have also coordinate with NRIS in the QA/QC of the NHD for Montana including the development of a lakes layer (funding provided by the BOR for lakes). NRIS is QA/QC stream naming; StreamNet staff helped set up ArcView project to accomplish the task. As part of the BOR contract, a lakes coverage is being created using the USFS 1:24 K coverages initially and then 1:100 000 K NHD where we don't have USFS property. The spatial component of the statewide lakes layer was completed with the next phase being synchronization with the MRIS lakes database.

ODFW Oregon StreamNet continued to maintain and update the Oregon 1:100,000 hydrography, including addressing inconsistencies with the Pacific Northwest hydrography and the hydrography of neighboring states. Staff also kept abreast of the emerging regional hydro data model and it's relationship to the PNW system. Technical assistance on hydrography-related topics and issues was also provided upon request.

WDFW In our lakes layer, we discovered discrepancies in the original water body ID code assignments made by Department of Ecology staff. We decided to carry both their “older” codes and our "newer" codes until the issue can be resolved. WDOE staff do not share our sense of urgency on the issue, which has delayed resolution. However, their approach has (inadvertently) assigned water body ID codes to certain lakes that exactly match legitimate LLID codes for streams in the 100K hydro layer. We feel this must be fixed, and continue to press WDOE for their support in this. Steering Committee members expressed a moderate-to-low interest in lakes layer development this year (given other emerging priorities), so this issue awaits full resolution next year.

Our internal GIS system was improved to allow compilers to see the stream names or LLID codes. Before this improvement, our tabular compilers had to switch to other resources to verify the stream.

The statewide 100K hydro layer was re-built based on Washington-defined basins (WRIAs) for greater flexibility in responding to in-state data requests. The HUC-based statewide tiling is also being maintained, for compatibility with regional efforts (like StreamNet).

Some issues concerning Washington data submitted to StreamNet with End Foot measures purportedly greater than the length of the stream were raised by PSMFC StreamNet staff; all involved are working to confirm and resolve the issues, which may require adjustment of the endpoints of certain data events.

Region We continued to maintain and distribute the 1:100,000 scale PNW Reach File (hydrography) through cooperation with state GIS personnel. We completed addition of LLID stream-based routes to all of Western Montana and incorporated an update of LLID stream-based routes for Idaho. We performed a complete update of all 1:100,000 scale PNW Hydrography files to the StreamNet web site. We also created a log file to track changes to the PNW Reach File and made it available via the StreamNet web site.

Staff participated as a contributor to the Hydro Framework Review process to develop a national hydrography standard format by reviewing and commenting on initial proposals.

Staff coordinated with efforts to prepare a National Hydrographic Dataset (NHD) by attending an NHD symposium and NHD training, and meeting with NHD project coordinators. Regional staff developed a cross reference application for transferring data between the PNW LLID-based stream referencing system and the NHD reach-based referencing system and created an internet site to deliver this application, related GIS files, and complete documentation for the application. The application is available at http://www.streamnet.org/nhdllid/index.html.

Objective 2 Data Management and Delivery

Task 7. Data Requests

Receive and respond to requests for data, source materials, and custom products. Response to requests will be honored within the limits of available resources, with priority given to information requests having direct relevance to the Fish and Wildlife Program. Other priorities will include implementation of the Endangered Species Act and federal, state, and tribal natural resource management activities.

In addition to providing data through the StreamNet website, project participants at all level responded to numerous specific data requests received directly from data users.

CRITFC Most of the data requests for CRITFC come through the StreamNet Library. See Objective 3, Task 4, for greater details. Responses to requests were honored within the limits of available resources, with priority given to information requests having direct relevance to the Fish and Wildlife Program. Other priorities included implementation of the Endangered Species Act and federal, state, and tribal natural resource management activities.

IDFG Idaho StreamNet filled 219 requests for data or information in 2001. The majority of these were species lists for specific locations by private consultants for use in environmental assessments. These requests are largely part of our association with the Idaho Conservation Data Center (part of the Natural Heritage Program). All information requests to the ICDC that may include fish are referred to IDFG StreamNet. We also filled numerous requests for GIS files of our salmonid distributions. A lesser number of requests were filled for redd count data and other miscellaneous GIS layers, such as wetlands and GAP Analysis data.

MFWP We filled 60 fisheries related GIS requests using StreamNet staff and have a log of all other requests filled by MFWP funding. We have supported FWP Fisheries Division Native Species Management, Westslope Cutthroat Trout Priority Areas and Yellowstone Cutthroat Trout Data Collection.

ODFW Oregon StreamNet answered a total of 22 data, 16 map/GIS related, and 41 'other' direct requests during the year. Almost 10,700 indirect requests are estimated to have been satisfied through the ODFW FTP site. The number is estimated because total downloads for one quarter of the year are not available, so an average of the other three quarters was used to cover the full year.

WDFW All Washington StreamNet staff participated in response to data requests, creating and delivering over 400 maps, dozens of data sets and ArcInfo layers for more than 30 distinct entities, including state, federal, local and tribal agencies, consultants, volunteer groups, and schools.

Significant requests this year included copies of the newly-updated bull trout distribution/use layers, the summary of mass-marked chinook from year 2000 released in the Columbia Basin, and maps of individual lakes displayed over a back layer of USGS topo map features. Significant data compilation and analysis support work was provided to the Rolling Review participants in the Columbia Plateau and Lower Columbia River provinces.

By popular demand, our GIS data release menu was updated to provide push-button access to JPG images of maps built using the menu system. Demand for map images that can be used in the PC environment is skyrocketing. The growing interest in using ArcView as a map-producing tool and in allowing direct access to our large-format plotters from networked PCs are indicators of this trend.

Region In response to a request from the NW Power Planning Council, staff compiled data and created maps of the number and percentage of salmon mass marked with an adipose fin clip and released during calendar year 2000. The intent was to determine the progress toward marking all hatchery fish for selective fisheries as recommended by the governors. The data were presented during a Council meeting and to a meeting of CBFWF managers. Internet web pages were created to disseminate the information through various means, including a set of maps illustrating mass marking during year 2000, a source spreadsheet of the mass marking numbers, and a summary report on mass marking. Following initial presentation of these data to the NWPPC, errors were detected in the initial data compilation. These were subsequently corrected and all maps were updated. Final submission of these data will be made to the Council early next fiscal year.

During the year we responded to 239 requests for data and/or assistance. In January we implemented a database to track data requests received and log the information that was provided. The log provides information on the nature of the request and the nature of the person making the request. Federal agency, state agency and consultant were the top three groups, respectively, requesting information.

Objective 3 Library / Reference Services

Provide a full service regional library for fish (and to some degree wildlife) literature (published and gray), including documentation of all data in the StreamNet database.

The StreamNet Library, located at the Columbia River Intertribal Fish Commission, is a full service library specializing in fish and wildlife related information and related agency gray literature. One of it's principal missions is housing references for all data contained in the StreamNet database. All of the individual agency StreamNet projects contribute reference materials to the library. ODFW also maintains an agency library that is partially supported by StreamNet.

Task 1. Collection Development

Develop a collection of materials applicable to the mission of StreamNet. Collect, catalog and organize materials to document data source materials, Fish and Wildlife Program activities and reports, and other gray literature for access by regional scientists, agencies, interested parties, and other libraries.

CRITFC Library staff received and cataloged literature supporting the StreamNet databases as submitted by Project members. Integration of StreamNet documents into the Library of Congress system continued. This will make all holdings available to all users through a single catalog system. Standards for document submissions were reviewed and discussed with the Steering Committee.

The StreamNet Library manages most of the library material for the Northwest Power Planning Council. Several times each year, the Council sends additional material to the Library. Staff completed cataloging the books in the original collection and began working on new documents received that include memos, notices and other internal documentation.

The Library actively acquires additional material relevant to its primary mission of serving the reference needs of the NWPPC Fish and Wildlife Program and within available budgets. Material was acquired through inter-library donations (free), at the suggestion of patrons, and at the Librarian's discretion. A total of 1,508 additional records was added to the general online catalog. These included new materials, as well as older, donated materials.

IDFG All of the new data entered into our internal data management system has complete reference information. However, because we did not submit data to PSMFC this year (in deference to system development) we did not submit reference materials to the StreamNet library.

MFWP The Fisheries Division support staff and a small contract are responsible for keeping the electronic version of the Fisheries Division Library updated. They send a CD to StreamNet library annually at the request of the librarian. StreamNet staff coordinated with the contractor who entered records into the library to add a species lookup and LLID lookup. We began assigning library references to species level data in MRIS. We requested the Fisheries Division continue funding of contractor to maintain Fisheries Division library.

ODFW Oregon provided reference data to the StreamNet Library for new data developed under Objective 1. The anticipated utility of the library software purchased during FY-00 was not realized because our Database Manager position remained vacant for much of the year and there was no one available to customize the new system. Staff maintained and added to library holdings, and continued to perform numerous maintenance, update and correction activities to the Oregon bibliography in preparation for migrating it to the new system. They also received 57 donations ranging in size from a single small box of documents to several boxes during FY 01. These donations came from a number of different sources including state, federal and private donors.

WDFW Staff continued to collect documents to support data set exchange with StreamNet. In addition, we are discussing expectations and drafting plans for documentation standards for spatial layers and for data sets that have both spatial and tabular components. FGDC-compliant metadata will be one of the components of our strategy, but decisions on what to provide for data sets with both spatial and tabular data are best left to the Steering Committee.

Objective 3 Library / Reference Services

Task 2. Provide Access to Collection

Provide user access to the materials described in Task 3.1 by providing facilities for storage of paper and electronic copies of documents, an online catalog of all documents in collections, and staff to answer location questions and respond to requests.

CRITFC The basic library facilities were maintained, enhanced and were available to users during regular business hours. All books and a backlog of material stored offsite were consolidated into the main collection. Some additional space was created for periodicals and new donations. Available space is nearing capacity (presently at 90% of existing shelf space), however, and new options are being evaluated. These include compact shelving, condensed storage of material (e.g. all electronic files), expansion of the present facility, or moving to a new location. Each option has its own advantages and disadvantages, but the easiest, least disruptive, and one of the cheapest is to expand the present facilities. Early discussions with the landlord indicate shelving space could be roughly doubled for about $40,000 per year.

The primary library catalog is now maintained to Library of Congress standards using InMagic library software. Library users can access the catalog remotely, via the Internet, or locally from one of two computer stations. Staff worked with Regional staff to develop a data exchange format between the StreamNet reference table and the new library catalog.

ODFW Plans to migrate all library tracking capabilities from the existing database into the new system were delayed because our database manager position remained vacant for much of the year. Lack of space has become a hindrance at both StreamNet supported libraries. The decision was made this fiscal year to move the ODFW StreamNet library to a larger room where all materials could be consolidated into one single location. The move should occur during FY-02.

Objective 3 Library / Reference Services

Task 3. Improve Electronic Access

Enhance the online capabilities of the StreamNet Library, including catalog access via the internet and an electronic archive of key Columbia Basin documents.

CRITFC The library catalog was converted to Library of Congress standards and installed on a separate server, which was integrated into the StreamNet system. This provides greater functionality, range, and standardization for library users.

A two-pronged effort was begun to expand electronic access to reference material. A high-speed scanner was acquired as a CRITFC in-kind contribution to the StreamNet project. The scanner was used to create electronic copies of several sets of documents including the 1990 subbasin plans, habitat monitoring protocols, and a few older reports which are in limited supply and/or fragile condition. The method works well but is time consuming and will require dedicated staff to make real progress.

The easier method of providing electronic documents is to capture them in electronic form as they are produced. Some professional journals and abstracts are provided as funds allow. Library staff also cooperated with the BPA and other organizations to link electronic documents to the Library web page and catalog.

Objective 3 Library / Reference Services

Task 4. Library Services

Manage the StreamNet Library and provide library services to the StreamNet user community and the general public.

CRITFC The Library maintained regular contact with users to inform them of new information and solicit suggestions for future improvements. Library staff maintained regular e-mail contact with users to publicize new acquisitions and other sources of information available through the Internet. In addition, users were occasionally surveyed to determine problems encountered and suggestions for new services. A variety of library services were provided last year:

Approximately 700 requests for information were answered, plus innumerable "directional" requests (e.g. Where is…, How do I…, etc.) which were not counted. In addition, we received several email requests for information from the library website, although it had been operational for a relatively short time. We also received a number of requests for literature searches on fisheries in specific rivers.

Users included researchers locating material for administrative records, technicians developing bibliographies on specific anadromous populations, and watershed managers searching for historic surveys and inventories.

At least two people per day visited the library to use the collection in person.

An access guide was added to the library web site as a page titled Services.

We lent 84 books to other libraries.

Off-site users were located at the NWPPC offices, Enterprise, OR, Pendleton, OR, Chile, Idaho, and other locations.

We maintain a brochure explaining library resources and services and make this available to users through the Internet and hardcopy distribution.

ODFW During FY 2001, the ODFW StreamNet library provided library services to over 300 StreamNet-related users, including providing almost 1,100 documents to patrons. Other information requests that could not be satisfied using library holdings were forwarded to appropriate responders around the state or other libraries. The library facility itself was often used as a meeting place for several Columbia River research and management meetings. A website established in FY-00 by ODFW StreamNet to provide direct access to electronic documents available from ODFW now has 11 documents available . We anticipate making more documents available once we're able to identify the ones that are most often requested. Electronic documents were also provided directly from the library to those users who didn't have Internet access.

Objective 3 Library / Reference Services

Task 5. Inter-library Coordination

Engage in networking activities with other agency and regional library service providers to provide better access to other collections that will enhance the StreamNet Library and to avoid unnecessary duplication of effort and materials

CRITFC Effective coordination with and use of the existing library resources allowed the StreamNet Library to develop faster than would have happened operating alone. There are two aspects of these benefits. First, libraries trade a lot of material among themselves as collections evolve. Documents on the Columbia Basin, anadromous fish and related issues can be obtained in these trades for only the cost of postage. Because the StreamNet Library has developed a network of collaborating libraries, we are often given first choice when material is surplused from other libraries. In this manner, we have filled in gaps in our periodical collection and obtained many significant out of print or rare materials that we could not have obtained otherwise. In the last year we worked directly with the WDFW Vancouver office, the Yakama Nation, and the Montana State Library to coordinate collection development and resolve cataloging issues.

The second benefit of coordination with other library resources was through the sharing of technology and experience with other professionals. We maintained memberships in professional organizations such as IAMSLIC, SLA, Cyamus, PNLA, NRIC, and OFWIM, and often shared insights from StreamNet at professional conferences of these organizations. In this way we learn more about the advantages and disadvantages of different methods of improving library services. StreamNet users benefited from improved services and fewer disruptions.

ODFW General inter-library coordination with the main StreamNet Library as well as other libraries around the world occurred on a regular basis throughout FY-01. Inter-library loan transactions were also processed during the year.

Objective 4 Services to Fish and Wildlife Program Activities

Provide technical data services to Fish and Wildlife Program decision-makers and appropriate Fish and Wildlife Program projects

StreamNet is funded as a regional data dissemination project under the NWPPC Fish and Wildlife Program. As a result, a primary objective is providing data and data services to the Fish and Wildlife Program and projects that are part of the program. In addition to the primary objectives of data development and data management and dissemination, StreamNet dedicates a portion of its capabilities toward responding to these needs each year.

Objective 4 Services to Fish and Wildlife Program Activities

Task 1 Monitoring and Evaluation

Assist in the development of products that contribute to the monitoring and evaluating (M&E) of Fish and Wildlife Program effectiveness. Specific area of involvement will include:

Monitoring and evaluation remain primary activities within the Columbia Basin, and the need for routine fisheries data useful for these activities remains strong. However, specific activities related to M&E during FY-01 were somewhat overshadowed at the basin level by efforts to develop and initiate Subbasin Planning. As a result, less activity for M&E was requested of the StreamNet project this year. This task was originally divided into three subtasks for general M&E participation, evaluation, and reporting, but all activities related to this task are presented together below.

CRITFC We reviewed OWEB monitoring protocols with ODFW staff. Their approach provides a stratified, statistically-sound approach to tracking changes in the condition of some habitat conditions. Further work will be needed to determine whether they are tracking appropriate parameters from the NWPPC and multi-species framework perspectives. Monitoring protocols still need to be developed for fish and wildlife populations, which are not covered by the OWEB habitat methods.

We conducted a one-day workshop with ODFW, NWPPC, NMFS, tribal, and City of Portland staffs to explore the feasibility of coordinating OWEB and EDT subbasin assessment methods. This appeared feasible after the first workshop and follow-up meetings were scheduled to address specific issues. When the methods are coordinated, we will attempt to extend the OWEB habitat monitoring approach to fish and wildlife populations during the subbasin planning process.

Presentations were made regularly to the Steering Committee when new information or action occurred at the regional level. Steering Committee prioritized data updates based upon regional monitoring needs.

MFWP Data needs were discussed at Steering Committee meetings and conference calls. Additional players were brought into the meetings to try and address regional needs.

ODFW Oregon's efforts this year consisted of reviewing data needs-related documents, and participating in discussions related to restoration projects and population viability analyses.

Oregon staff reviewed a single monitoring and evaluation plan related to the Columbia Basin, and provided various data and maps to support evaluation efforts including development of coho priority areas. Staff work plans were adjusted slightly in order to provide support for NMFS's Viable Salmonid Population analysis.

Objective 4 Services to Fish and Wildlife Program Activities

Task 2. Watershed Projects

Provide data and data services to Fish and Wildlife Program-sponsored watershed planning and assessment projects

Watershed level projects are anticipated to be a primary means of mitigating for habitat losses in the basin and for enhancing fish populations under various state programs. StreamNet activities in this area in FY-01 involved development and dissemination of data and map packages containing all StreamNet data by subbasin for the Subbasin Summaries. In addition, data were provided to watershed projects through the StreamNet website and through direct data requests. These requests were addressed under Objective 2, Task 7, Data Requests.

CRITFC Subbasin planning activities have yet to begin. StreamNet staff worked with Council and NMFS staffs to develop methods of coordinating watershed assessments and data management when this effort begins.

ODFW Oregon StreamNet assisted in efforts to identify potential anadromous salmonid habitat above specific barriers in the Lower Columbia that contributed to the Northwest Oregon Forest planning process.

Objective 4 Services to Fish and Wildlife Program Activities

Task 3. Stock Assessment Projects

Provide technical assistance to the Upper Columbia Basin and Upper Snake River Basin resident fish stock assessment projects, including a) identification of regionally consistent data exchange standards and b) Internet access to project data and other information. Specific actions will be defined in consultation with stock assessment project managers

IDFG Idaho StreamNet has contacted the Upper Snake River Resident Salmonid Stock Assessment Project to discuss data management and data delivery to StreamNet. Agreement was made to work together, but because of budget limitations and higher priorities no action has been taken.

ODFW Oregon was forced to drop this task due to Project budget cuts.

WDFW O'Connor and Burns continued to assist the Joint Stock Assessment Project for resident fish in Northeast Washington. Data records for this area from the WDFW historical Stream, Lake and Fish database were submitted, and guidance given about using them. O'Connor also began a review of current JSAP partner sampling data formats, in order to better inform the current StreamNet data exchange formats for Fish Survey data. This will enable simpler conversion of JSAP fish and habitat data to StreamNet formats next year.

Objective 4 Services to Fish and Wildlife Program Activities

Task 4. Service to Other Fish and Wildlife Program Projects and Activities

In consultation with CBFWA, the Council, and BPA StreamNet will provide technical assistance and data services to select Program projects

CRITFC Staff discussed possible StreamNet services with NWPPC and NMFS staffs for subbasin and recovery planning efforts. Although specific services were not fully defined, NWPPC staff expect StreamNet to provide fishery information to the subbasin assessment process and provide other as yet undefined services to subbasin planners. The project has particular strengths in the areas of 1) providing existing information, 2) providing data management tools and assistance to planners, and 3) capturing new information developed during the new round of subbasin planning. We also attended one Regional Data Management Committee meeting. As with subbasin planning, movement on this issue was slow in FY-01.

IDFG Idaho StreamNet provided technical assistance to a variety of FWP projects. Most notably, we have collaborated with the Idaho Supplementation Studies (ISS), to provide data management services in the form of databases and interfaces for redd count, carcass count and juvenile trapping data. These systems are described in more detail in earlier portions of this annual report.

ODFW Oregon StreamNet developed a summary of tagged and untagged Oregon hatchery release data for the NWPPC. We also provided information support for all Columbia River Compact hearings, including producing fact sheets, action notices, and joint staff reports. Progress was also made toward modifying an existing ODFW web site to provide real-time information related to Lower Columbia and Willamette River fisheries. This site would be linked to StreamNet and would provide access to Compact produced documents associated with StreamNet data.

Region Bonneville Power Administration may begin requiring all projects funded by them under the Fish and Wildlife Program to submit the data collected by these projects. The intention is to prevent loss and make all these data available to everyone. Associated with this effort, they wish to make the data amenable to combination with other projects by contractors using standard techniques when possible. As an initial effort in this quest, BPA asked StreamNet to work with the Shoshone-Paiute Tribes to code their locations using the standard LLIDs from the 1:100,000 scale Pacific Northwest hydrography GIS layer. StreamNet staff worked with a Shoshone-Paiute biologist to describe how to code locations in this manner. It is hoped that this small pilot project will be successful and be a model for the larger and more diverse work that is done under BPA funding.

Objective 4 Services to Fish and Wildlife Program Activities

Task 5. Protected Areas

StreamNet will a) maintain and provide access to the Council's Protected Areas data set, b) archive the official version as a historic record, and c) in consultation with the Council, respond to requests for information concerning Protected Areas

The Protected Areas database was maintained on the StreamNet website. We also responded to requests for this information. During the year we developed a plan to update this data set by tying the protected areas to the 1:100,000 hydrography with LLID location codes. This will allow protected areas to be depicted along with other relevant fish data. Most of this work will take place early next fiscal year. The Montana StreamNet project sent the Montana Protected Areas data to the Regional staff updated with LLIDs and measures

Task 6 Basin Data Needs

StreamNet will provide information and assistance to regional reviews of data management projects and data management needs conducted by the NWPPC, ISRP, ISAB and other regional entities

The StreamNet Project allocates time each year to participate in regional efforts to define long term data and data management needs These efforts continued in FY-01, as described below.

Task 6.a Data Management Needs

Work with regional entities to develop an analysis of regional data management needs, challenges and capabilities

CRITFC Phil Roger was named as a member of the Council's Regional Data Management Committee (RDMC) and Regional Assessment Advisory Committees (RAAC). He advised these groups on the accomplishments and challenges of data management and the role StreamNet can play in regional data management. The RAAC committee agreed on key data and analyses needed to validate the EDT method of subbasin assessment. These data needs and activities were reported to the Steering Committee.

IDFG The IDFG StreamNet project coordinator was one of the founding members of the Regional Data Management Committee (RDMC), organized by members of CBFWA. The vision of a coordinated, comprehensive regional data management system envisioned by RDMC was quickly taken over by the Northwest Power Planning Council and NMFS. The efforts continue in that venue.

ODFW Oregon StreamNet assisted in a number of ways to advance the understanding of data needs associated with the NWPPC Fish and Wildlife Program. The amended Fish and Wildlife Program document was reviewed for implicit or implied data needs. We provided preparatory assistance and project direction/supervision in support of NMFS's Viable Salmon Population analysis, and we coordinated with NMFS, Council staff, and ODFW staff to secure funding and cooperation in support of the VSP effort.

WDFW Washington StreamNet staff participated in several activities in support of the NWPPC Fish and Wildlife Program. We provided specific comments on the feasibility of compiling data to support salmonid run reconstruction, offered insight into competing models for basin-wide data management, tracked goals and progress of the SAIC contract in order to be prepared to respond at interview time, participated in discussions instigated by NWPPC and NMFS staff regarding the creation of a Regional Data Management Committee, and described StreamNet products and capabilities to Council members, Council staff, and CBFWA representatives from Washington.

Region Staff participated in regional data management efforts, such as attending Regional Data Management Committee meetings. Staff worked with NMFS and NWPPC on data needs for the Viable Salmon Population analysis and assisted development of a contract for ODFW StreamNet to conduct a pilot project to locate and obtain VSP relevant data in the Willamette and Lower Columbia. Staff also worked with NMFS on data needed for the Salmon Watershed Assessment Model and provided NMFS with an inventory of redd count data contained in the StreamNet database.

Task 6.b Data Needs Workshop

Promote organization of a regional 'data needs workshop' to establish regional data / information needs and priorities and to develop recommendations for roles and responsibilities for acquiring and providing the needed data / information

Work on a regional data needs workshop was put on hold in deference to the Regional Data Management Committee and the plan by NWPPC to hire a contractor (SAIC) to conduct a region wide data management needs assessment. The StreamNet project supports these efforts and will contribute to them as much as possible next fiscal year.

Objective 5 Project Management / Coordination

Provide effective leadership that ensures the production of high quality products targeted at critical applications and the development of these products in a timely, cost-effective manner.

This objective relates to project administration at both the Regional and the cooperating agency level. All project members participated.

Task 1. Manage Project Activities

Administer all aspects of the project at the regional and sub-contractor levels, including oversight of budget, personnel, work statement preparation and implementation, coordination among participating agencies, active participation in steering committee work, and project reporting

All project participants conducted regular project management functions, including staff supervision, training, budgeting and reporting.

CRITFC Normal administrative functions were provided and performed in FY-01. All CRITFC contract and personnel policies were completed, including annual staff performance evaluations and salary adjustments. All steering Committee meetings were attended and we worked with the Steering Committee to identify data and information priorities and to incorporate these into the work plan. Budgets and work plans were adjusted as required by the NWPPC and BPA.

FWS Staff participated in each of the quarterly Steering Committee meetings, reviewed email, and commented when appropriate. Quarterly reports were prepared and submitted throughout the year.

IDFG The IDFG StreamNet project coordinator completed all required quarterly and annual reports in FY-01. Budgets and work statements were prepared in accordance with the proportion of total StreamNet budget received by IDFG. He also participated in Steering Committee meetings, helping to set both technical and strategic direction for StreamNet. The IDFG StreamNet coordinator provided personnel supervision and direction to IDFG StreamNet staff. IDFG StreamNet is part, albeit a large part, of the IDFG GIS and data management program, and other efforts were leveraged to build on the foundation provided by StreamNet. Within IDFG StreamNet, we established a full-time StreamNet data manager for the first time. We have two people full-time on StreamNet, a programmer/database analyst and the new data manager. GIS staff are only part-time on StreamNet, but their work provides numerous benefits to StreamNet.

MFWP Staff provided coordination and administration to the project through meeting attendance, staff supervision, etc.

ODFW All aspects of the Oregon StreamNet project were successfully administered, including budget oversight, hiring, maintaining and evaluating personnel, staff work plans and training, project implementation and coordination, Steering Committee and technical issues meeting attendance, and development of FY-00 Annual Report and quarterly progress reports for FY-01.

WDFW Staff managing the StreamNet Project in Washington went beyond standard administrative activities and began focusing on "branding" StreamNet-provided functions and products to showcase the contributions of the Project to WDFW staff and other data users in Washington state. Vacant positions have been filled, training has been completed, and the WDFW StreamNet team is functioning at its highest level in years. WDFW staff continue to be actively involved in Steering Committee duties, including taking the lead on improving and extending current data exchange formats to accommodate the challenges of the data we compile.

Region All routine project management activities were completed, including personnel management, budget preparation and tracking, project proposal submission, and reporting. PSMFC staff participated in training on Preventing Harassment in the Workplace conducted by PSMFC. Additional work was done to improve the Access database based internal project reporting system. This will speed report preparation in the future. Delays in finishing the database system delayed reports in FY-01.

Objective 5 Project Management / Coordination

Task 2. Participate in Fish and Wildlife Program Development Activities

Organize, facilitate, and/or participate in appropriate coordination meetings with BPA, CBFWA, the Council, ESA officials, ISAB/ISRP, and/or staff and management of participating organizations aimed at identifying ways that StreamNet might more effectively contribute to the Fish and Wildlife Program (FWP). Participate in advisory groups, task forces, and other groups whose purpose is enhancing the effectiveness of the Fish and Wildlife Program and its data development activities.

StreamNet project members participated in a variety of regional program development activities, as requested.

CRITFC Staff had several intense discussions with NWPPC staff and contractors regarding management of EDT data and other services the project could provide to regional fish and wildlife restoration efforts. At one point, Council staff did not see any more than a limited role for StreamNet in updating existing data sets. Discussions regarding StreamNet's role under the Fish and Wildlife program continued with NWPPC staff and contractors and with the RAAC group. These issues are moving slowly and no specific conclusions were reached, although Council staff saw a limited role for the project.

Discussions regarding StreamNet's role under the Fish and Wildlife program continued with NWPPC staff and contractors and with the RAAC group. Battelle Northwest Labs made a pitch to the CBFWA Anadromous Fish Committee to provide significant information management services in the form of a regional "collaboratorium" hosted on the Battelle mainframe. The proposal was not fully formed and the reception was lukewarm. Battelle would like a large role in regional information management. The WDFW representative indicated it may be a choice between Battelle or StreamNet. NWPPC staff is more receptive to a significant role for StreamNet in subbasin planning efforts. Specifics were not completely specified, and discussions will continue

Phil Roger is a formal member of the Council's RDM and RAA Committees. He is also a key member of the *ad hoc* subbasin assessment development discussion group composed of NMFS, ODFW, and NWPPC staff. Many formal and informal meetings with these people were held in FY-01. He participated in meetings as scheduled and worked with group members outside of meetings to prepare material for group consideration. Many of the discussions involved developing subbasin assessment guidelines for subbasin planners. Completing these assessments will be a particularly data-intensive activity.

The Council released final draft guidelines for subbasin assessments and subbasin planning. These provide significant opportunities for defining a StreamNet role. CRITFC and ODFW staff developed a work statement and budget to implement subbasin planning in Oregon, defining specific roles for StreamNet to 1) provide information to subbasin groups, 2) assist subbasin groups with a variety of data management services, and 3) capture new information, including the EDT data sets, developed in this round of subbasin planning.

IDFG The IDFG StreamNet project coordinator was one of the founding members of the Regional Data Management Committee (RDMC), organized by members of CBFWA. The vision of a coordinated, comprehensive regional data management system envisioned by RDMC was quickly taken over by the Northwest Power Planning Council and NMFS. The efforts continue in that venue.

ODFW Oregon StreamNet staff successfully contributed to the Fish and Wildlife Program through coordinated efforts with Oregon CBFWA representatives and the Willamette - Lower Columbia Technical Recovery team.

Region PSMFC and WDFW staff met with NWPPC Chair Larry Cassidy and Staff Member Brian Walsh to review StreamNet project functions and capabilities. PSMFC staff gave a presentation on the StreamNet system in order to help NWPPC understand the role that StreamNet is meant to fulfill in Columbia Basin fish and wildlife management.

Objective 5 Project Management / Coordination

Task 3. Coordinate with Other Related Activities

Maintain communications between StreamNet and other applicable regional and state-level fish and wildlife activities to identify means for collaborative data collection, storage, and dissemination. Collaborative data activities will target tribal fishery programs within the Columbia Basin, federal land managers' fishery programs, state fish and wildlife agencies, and, with respect to water use and stream development, state water resource management agencies. Collaboration with coast-wide and private data collection/compilation efforts will be pursued when this supports overall project goals. Areas of particular emphasis are 1) participation in Fish and Wildlife Program monitoring and evaluation activities, and 2) exploring opportunities for integration of StreamNet data exchange formats into Fish and Wildlife Program contract terms and conditions.

IDFG Idaho StreamNet has developed a very close working relationship with several IDFG fisheries projects and the IDFG Fisheries Bureau headquarters staff. We have developed key data management tools for both FWP projects and internal IDFG fishery projects. We also provide a variety of technical services and assistance. As a result, IDFG fish biologists are increasingly using StreamNet georeferencing and data standards. This will facilitate the transfer of data from the field to StreamNet and other regional data management projects.

ODFW Staff attended numerous meetings and reviewed several documents associated with data collection efforts, data related to legislative mandates, and state and federal data integration efforts.

WDFW Washington StreamNet staff continued to provide spatial data management expertise to the Oregon-Washington 24K Hydro Framework Development Project. In addition, coordination work and data exchange support continued with the Joint Stock (Resident Fish) Assessment Project in Northeast Washington, where the goal is to convert and exchange resident fish and habitat survey information with the StreamNet Regional Data Manager for incorporation into the StreamNet Online Data System.

Region StreamNet staff met with staff from California Department of Fish and Game to discuss issues related to time series (trend) and habitat restoration project database structures. CDFG is in the process of developing a database management system for their state, and they are looking to StreamNet as a template for how to create their system. Their intention is to create a system that will mesh with StreamNet so that a coast-wide fisheries management database will be available to biologists. Time spent in our assistance to them is paying off both for California biologists because of the more consistent data and directly for StreamNet as we have been able to acquire for our use programming work they have done for their system.

StreamNet personnel also worked with the Oregon Watershed Enhancement Board and the Regional Ecosystem Office to create minimum data reporting requirements for a regional habitat restoration database.

Under separate funding, StreamNet personnel worked with state and federal water quality agencies on a strategy for a regional macroinvertebrate sampling database. This database could be used for water quality monitoring and research needs. We are helping these agencies to work with standard hydrography and other conventions, and to create reliable databases, so that information they collect will be accessible and have the ability to intersect with data from StreamNet.

According to the Biological Opinion issued by NMFS for operation of the mainstem Snake and Columbia river dams, the U.S. Army Corps of Engineers (and Bonneville Power Administration) are responsible for creating a water quality database for the mainstem rivers. In taking up this task, the USACOE sought assistance in data management from organizations already involved in this type of work. StreamNet personnel attended a meeting convened by the USACOE to discuss a strategy for creating the water quality database. StreamNet, USGS, Washington Department of Ecology, US Forest Service, and others presented their ideas for how to manage these types of data and on the types of data each of these organizations had, and a discussion was held to help guide the most effective way to create a valuable database to meet the needs of the Biological Opinion.

StreamNet personnel met with NMFS to discuss NMFS's plans for a fisheries database that they need, and plan to create, to support their work related to the Endangered Species Act.

Objective 5 Project Management / Coordination

Task 4 Prepare Public Information Materials.

As needed, produce public information materials including updated versions of the project brochure, computer demonstration materials, and/or other appropriate materials

StreamNet Project functions in the diverse arena of the Columbia River Basin and the Pacific Northwest Region. A number of actions were completed to inform entities within the region about the project and the information that it can provide to inform various management, planning and decision making activities. This task was broken into two subtasks in the work statement to cover development of informational materials and participation in meetings. Specific actions taken in FY-01 are as follows:

CRITFC Staff produced an updated StreamNet Library brochure and Access Guide listing services, hours and cost recovery fees. Library staff also had a paper accepted for presentation at the annual NRIC conference

IDFG The Idaho StreamNet coordinator served as the conference chairman for the 2001 Northwest GIS User Group Conference. As such, he was responsible for planning and carrying out the 5-day conference with an attendance of 250 people. Other IDFG StreamNet staff provided key support in both the planning stage and actual conference activities.

ODFW Oregon StreamNet completed the Columbia River Fish Runs and Fisheries Status Report, 1938-2000. We also gave numerous presentations and participated in outreach opportunities as necessary to promote StreamNet activities in Oregon. Oregon staff also participated in a number of local, state, region and national conferences and meetings promoting StreamNet's activities.

WDFW Washington StreamNet staff made presentations and/or answered questions concerning StreamNet data and services at the Western Washington Sportsman Show and the WDFW Fish Program Science Division Annual Meeting. In addition, work began on a demonstration habitat restoration project assessment tool that was scheduled to be described in a talk given at the Organization of Fish and Wildlife Managers Annual Meeting in November, 2001.

Region Staff participated in preparation for the annual meeting of the Organization of Fish and Wildlife Information Managers, scheduled to be held in Portland, Oregon, in November 2001. Staff began preparation of three presentations that will be given at the OFWIM meeting.