StreamNet 2013

Annual Report

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Chris Wheaton, Bart Butterfield, Dawn Anderson, Cedric Cooney, Steve Pastor, Brodie Cox, John Arterburn

Pacific States Marine Fisheries Commission, Portland, OR, 97202

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1. Executive Summary

The Pacific States Marine Fisheries Commission (PSMFC) hosts StreamNet, which provides access to regional fish data by maintaining a coordinated, standardized, web-based distributed information network. The need for regionally coordinated, securely stored, and readily accessible data has been identified by the Northwest Power and Conservation Council (NPCC), the Bonneville Power Administration (BPA), and the National Oceanic and Atmospheric Administration Fisheries Program (NOAA). StreamNet works cooperatively with the agencies that create the data to embed StreamNet supported technical staff inside these agencies and to lead or cooperate in a number of initiatives to aid in assuring a regional approach to these issues.

During 2013 StreamNet helped to lead implementation of the Coordinated Assessments (CA) project. Accomplishments included completion of the initial pilot effort and development of Data Exchange Standards (DES). In 2013 updates to standard data types were largely put on hold in order to focus on the CA project, which focuses on the key indicators and metrics that have been identified as priorities for reporting progress on implementation of the FCRPS Biological Opinion (BiOp). During the year new funding was sought for the CA project, and at the close of 2013 a $500,000 grant from the EPA to StreamNet subcontractor WDFW was imminent.

Staff at PSMFC and subcontracting agencies also provided leadership in other projects in 2013, including a Database Backup Assessment and Inventory for all BPA sponsored projects collecting fish data, and initiation of Device Trials to test automated data flow and hardware capability in field projects.

The StreamNet subprojects in the state agencies all contributed to development or improvement of agency data storage systems in 2013. In addition to CA, focus continues to be on increasing the speed and efficiency of data conversion to the regional standard StreamNet DES, and then submission to the StreamNet database. The long term goal is to develop the capacity for the agencies to host data in the regional standard and share it via web services and/or to transfer data to StreamNet via web services.

A wide variety of data types were disseminated through the StreamNet website in 2013 (www.streamnet.org). Overall use of the site increased substantially over past years, but time on the site decreased. We provided several data query approaches used to locate, display and download data from the StreamNet main database, including the Integrated Query System (IQS) which integrates both tabular and map based query approaches into a single system. The Data Store online data archive provides access to non-standardized data from any source, and is a data repository identified as a secure location for data storage for projects throughout the region.

In implementing the CA project, substantial progress has been made in 2013. However, during the process of inventorying data repositories, it became clear that improvements may be needed to prioritize identifying repositories for data. The various state and tribal agencies are at significantly different stages in developing the capabilities of their data management infrastructure, so developing a region-wide approach to sharing these indictors will continue to require more time and/or more resources. The significant institutional knowledge of an experienced cadre of biologists that have been assessing fish populations for many years may need to be replaced with a more automated and documented system in order to assure continuity of population assessments. Projects such as StreamNet could serve a key role, both within agencies and in regional coordination, in assuring that this documentation and the data needed to inform the assessment process is accessible and stable in the future.

2. Introduction

The majority of fish-related data originate with the region's state, tribal and federal fisheries agency sampling programs. These data are generally used internally, and may be difficult to access across organizational boundaries. The need for regionally coordinated, securely stored, and readily accessible data has been identified by the Northwest Power and Conservation Council (NPCC), the Bonneville Power Administration (BPA), and the National Oceanic and Atmospheric Administration Fisheries Program (NOAA). StreamNet supports a regional approach to data management, coordination, and standardization. We work cooperatively with the agencies that create the data (Table 1) to embed StreamNet supported technical staff inside these agencies to locate, obtain, standardize, and georeference the data to the regional stream network (hydrography). This data is then submitted to a central database at Pacific States Marine Fisheries Commission (PSMFC). StreamNet provides access to this data by maintaining a coordinated, standardized, web-based distributed information network. At StreamNet data collected by partners are stored, quality checked, and made publicly available through the StreamNet website, www.streamnet.org (Figure 1).

This project primarily support the Fish and Wildlife Program's Strategy: "*Work with regional federal, state and tribal agencies, and non-governmental entities to establish a coordinated, standardized, web-based distributed information network and a regional information management strategy for water, fish, and habitat data. Establish necessary administrative agreements to collaboratively implement and maintain the network and strategy;*" and helps to answer the Program questions: "*How has your work supported exchange and dissemination of fish and wildlife data or the development of a database to manage data that may be shared regionally, relative to the RM&E data management strategies roadmap: (*Identification of Management Questions and Strategies; Documentation of Protocols; Data Entry; Agency Data Storage; Regional Sharing; Reporting).

Table 1. Formal partners participating in the StreamNet project.

Participating Agency	Role	Acronym
Pacific States Marine Fisheries Commission	Project sponsor: project administration; data storage, QA and dissemination; regional coordination	PSMFC
Columbia River Inter-Tribal Fish Commission	Project partner under separate contract: manage StreamNet Library, data acquisition, data standardization	CRITFC
Idaho Department of Fish and Game	Subcontractor: data acquisition, data standardization, system development	IDFG
Montana Fish, Wildlife and Parks	Subcontractor: data acquisition, data standardization	MFWP
Oregon Department of Fish and Wildlife	Subcontractor: data acquisition, data standardization, system development	ODFW
US Fish and Wildlife Service	Subcontractor: data acquisition, data standardization for national fish hatcheries	FWS
Confederated Tribes of the Colville Reservation	Subcontractor: data acquisition, data standardization for national fish hatcheries	CCT
Washington Department of Fish and Wildlife	Subcontractor: data acquisition, data standardization	WDFW

StreamNet serves as a regional coordination body to support data management and facilitate cooperation across organizational boundaries. StreamNet staff are involved in standardization and coordination efforts on a wide variety of data management issues. We work closely with states, tribes, agencies, and with organizations such as the NPCC, Columbia River Intertribal Fish Commission (CRITFC), and the Pacific Northwest Aquatic Monitoring Partnership (PNAMP) to ensure that the infrastructure of data management can communicate, share, and interpret data effectively across boundaries. The StreamNet project supports coordination through establishing and implementing basin-wide data reporting standards for a specific suite of fish related measures, including abundance, distribution, and productivity, with a long term goal of extending coverage to additional metrics of regional importance.

In recent years there has been a regional initiative to streamline and coordinate RM&E work due to the complexity, scale, and cost of these efforts. NPCC direction, the BPA Data Management Strategy, and the PNAMP RM&E Strategy Implementation Road Map led StreamNet to concentrate on coordination and efficiencies as our priority in 2013. The goal is to make information collected in the Columbia Basin standardized and accessible, in order to inform management questions and strategies. StreamNet can serve an important function in this effort both by building and maintaining data management infrastructure and by coordinating data management to foster effective data transfer across structural lines.

Data standardization and sharing are accomplished by StreamNet data specialists within the agencies. These data specialists locate and acquire data, convert it to standard (DES) format, perform QA/QC, add georeferencing to tie the data to the stream network (hydrography), assist with development and utilization of database systems within agencies, and then transmit the data to the central StreamNet database at PSMFC for public dissemination. Data disseminated through the project is primarily focused on the Columbia Basin (Figure 2), but other data are included when they are obtained through other contracts or are consolidated in agency databases. Much of the tribal data flow is through the respective state StreamNet projects or through the Columbia River Inter-Tribal Fish Commission (CRITFC), which is a full partner in the StreamNet project but supported through a separate contract.

During 2013 project data collection and coordination focused on leadership of the Coordinated Assessments (CA) project with PNAMP. CA is an effort to locate and obtain data on four high level viable salmonid population (VSP) indicators, and to develop Data Exchange Standards (DES) for these indicators.

In addition to this work, StreamNet also serves as a searchable archive and approved environmental data repository for data sets that do not conform to the StreamNet DES, ensuring that they are protected for the long term and remain accessible for use. These data sets include the NPCC Protected Areas list, data sets from subbasin planning, the Hatchery Scientific Review Group (HSRG), and all other data sets submitted to the Data Store, the StreamNet online data archive.

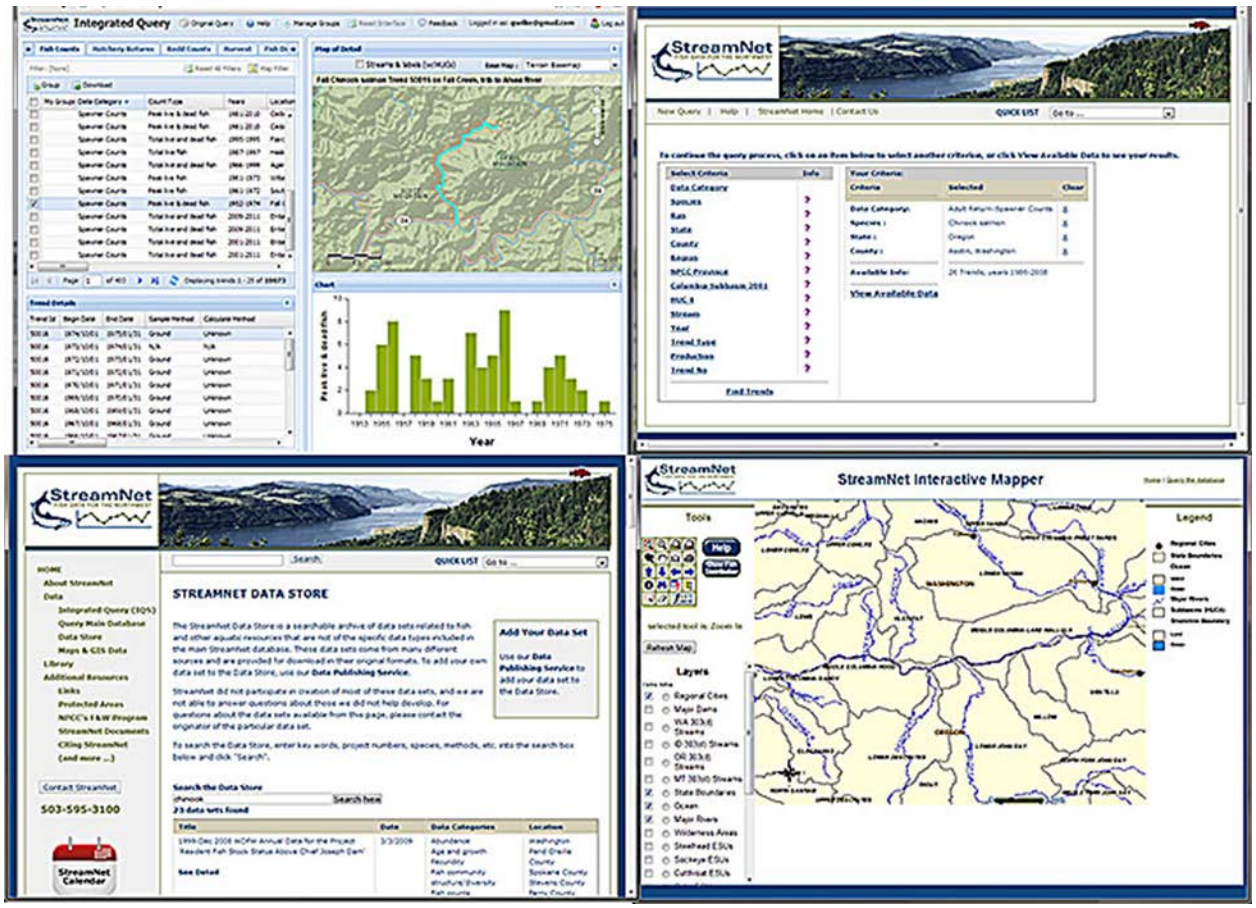

Figure 1. StreamNet Website Views

Primary Focal Species: Chinook - Deschutes River Summer/Fall ESU, Chinook - Lower Columbia River ESU (threatened), Chinook - Mid-Columbia River Spring ESU, Chinook - Snake River Fall ESU (threatened), Chinook - Snake River Spring/Summer , Chinook - Snake River Spring/Summer ESU (threatened), Chinook - Upper Columbia River Spring ESU (endangered), Chinook - Upper Columbia River Summer/Fall ESU, Chinook - Upper Willamette River ESU (threatened), Chum - Columbia River ESU (threatened), Coho - Lower Columbia River ESU (threatened), Cutthroat Trout, Coastal - Southwest Washington/Columbia River ESU, Cutthroat Trout, Coastal - Upper Willamette River ESU, Cutthroat Trout, Westslope , Cutthroat Trout, Yellowstone , Kokanee , Sockeye - Deschutes Subbasin, Sockeye - Lake Wenatchee ESU, Sockeye - Okanogan River ESU, Sockeye - Other, Sockeye - Snake River ESU (endangered), Steelhead - Lower Columbia River DPS (threatened), Steelhead - Middle Columbia River DPS (threatened), Steelhead - Snake River DPS (threatened), Steelhead - Upper Columbia River DPS (threatened), Steelhead - Upper Willamette River DPS (threatened), Trout, Bull (threatened), Trout, Interior Redband , Trout, Rainbow

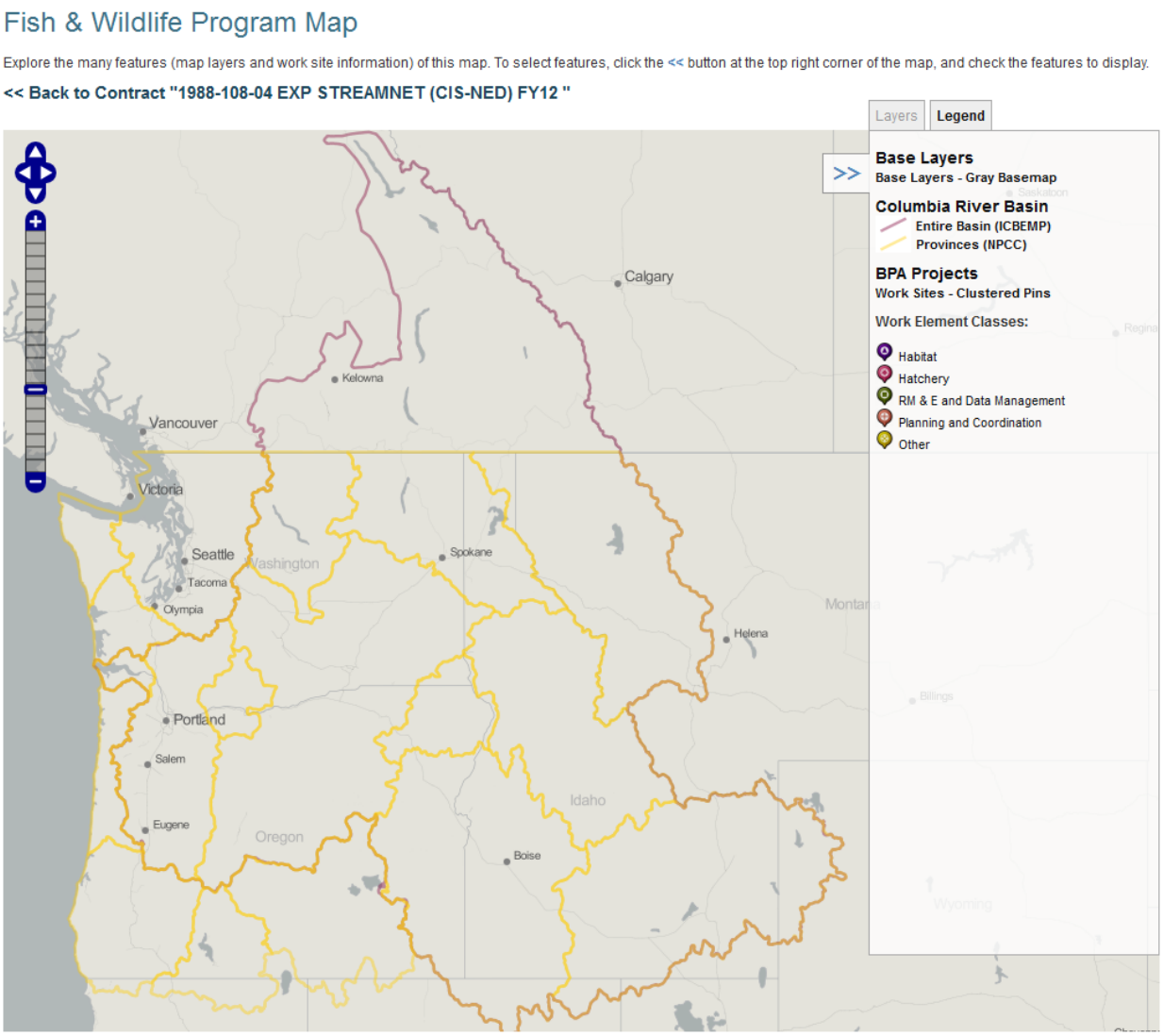

Figure 2. StreamNet Project Area: Columbia Basin

Project Map: *http://www.cbfish.org/Project.mvc/Map/1988-108-04*

Contract Map(s): *http://www.cbfish.org/Contract.mvc/Map/60412*

3. Results

Regional Coordination

StreamNet contributed to the coordination and standardization of monitoring data throughout the basin in 2013. We actively supported improving data sharing capabilities in the region through the Coordinated Assessments project. This project will use an exchange network approach and dynamic web services to share data. With the leadership of StreamNet cooperators in WDFW, a grant was obtained from the EPA specifically to work towards automated data sharing of key high level indicators for the region. We continued to work with our partners in IDFG, CCT, MFWP, ODFW and WDFW to promote data standardization within agencies by assisting them with development of database systems that will ultimately have the capability to share data directly in regional format.

The FWS already has an internal hatchery database system, and CRITFC is working on a tribal system with other funding

StreamNet coordinated closely with PNAMP in providing technical guidance to the Coordinated Assessments, including completion of the initial pilot effort and development of Data Exchange Standards (DES) for the project. Staff at PSMFC and subcontracting agencies also coordinated with state, federal and tribal agencies in support of increasing data flow in the region and to encourage increased use of information technology to improve the efficiency of data sharing.

The StreamNet project performed its planned data management and coordination activities during the period. Details on use of the StreamNet data delivery systems and responses to direct requests for data and information are presented in Appendix A. Details of activities by individual Work Element title are presented in Appendix B.

Coordination is still needed in the GIS arena, particularly surrounding hydrography management and maintenance. At the end of 2013, ODFW is still in the process of finalizing a long-term hydrography data management strategy as it relates to the NHD and the StreamNet regional hydrography dataset. While maintaining aquatic resource data on the NHD is the preferred approach, the StreamNet project and other funding constraints may dictate an alternative hydrography data management strategy.

The IDFG StreamNet subproject continued assistance with development of the Idaho Fish and Wildlife Information System (IFWIS), and was able to download data directly from the system in a single step in order to simplify standardization of the data and speed submission to the StreamNet database, saving significant time from the previous approach. The MFWP StreamNet subproject continued working with the Fish Bureau to scope out a new data management system. The ODFW StreamNet subproject continued work to construct a data management system capable of serving StreamNet DES data into StreamNet through automated means and recovery population data to the ODFW Salmon & Steelhead Recovery Tracker interface for distribution to StreamNet, NOAA and other management partners. Oregon StreamNet staff also coordinated internally and externally to ensure priority Coordinated Assessments (CA) efforts were addressed. Coordination with ODFW, other agencies, tribes, regional groups, non-profits, etc. beyond the CA process was limited in CY-2013, and no coordination efforts outside the FWP were conducted. The WDFW StreamNet subproject coordinated with the Biological Data Program in WDFW on ongoing development of the Juvenile Migrant Exchange and the SCoRE data delivery system, which will be able to serve data to StreamNet in the future.

StreamNet continued to coordinate with partner agencies to build systems with regional data sharing capability. The goal is to make it possible to harvest data directly for loading into StreamNet through automated means. When implemented, this will significantly speed the process of obtaining annual data updates, and allow our data stewards to expand to the acquisition of additional priority data types. The IDFG StreamNet subproject can currently accomplish this through their IFWIS database, which the Idaho StreamNet project helped to initiate and partially supports. The Coordinated Assessments project is designed to build this capability in all the data source agencies for a few key indicators. StreamNet worked with the agencies to develop procedures for internal conversion of the data to regional standards through a DES, and will now help them initiate development of an automated data dissemination approach modeled after the EPA Exchange Network approach.

Data Management

StreamNet continued to acquire fish data from our four partner state fish and wildlife agencies (ODFW, WDFW, IDFG and MFWP), one federal fisheries agency (USFWS for data from the national fish hatcheries), and one tribe (CCT). These data have been created through a variety of funding processes and sources, only some of which are

through BPA or other federal programs. As a regional data coordinator StreamNet strives to provide all data of a given type from all sources. The project uses subcontracts to support data stewards inside these agencies to acquire, quality check, develop metadata, convert when necessary, and update data types routinely disseminated through StreamNet (Table 2), and to convert these data to the regional data standard. The data are then submitted to the StreamNet database at PSMFC, where they are quality checked and managed so they become available to the several StreamNet online data query systems. The data are then made publicly available for viewing and download in standardized format through the project website, www.streamnet.org.

Oregon StreamNet staff sought to develop and institute a file naming standard for the agency to improve overall data flow. Significant time was spent participating in the development, update and maintenance of the CA and StreamNet CA DES's throughout the year, and developing/modifying a database for exchanging the four CA DES indicators. NHD hydrography migration continued, and the hydrography was maintained throughout the year. Oregon also conducted an inventory of existing juvenile abundance data. The work ODFW has done with the CA project has further illuminated the need for standards in field and file names, metadata, folder organization, data sharing agreements and data management plans, not only for Recovery Planning data but for ODFW as a whole.

Database Backup Assessment and Inventory

At BPA's request, during 2013 StreamNet staff at PSMFC and all of the partner agencies spent considerable time conducting a data inventory to determine the location of project data. The project was implemented to allow a formal assessment of data security and accessibility of fish metric data collected by BPA projects across the basin. Technicians conducted extensive inventories by interviewing key tribal and agency staff, and located a significant portion of the data requested. Responses indicate that the location and accessibility of data remains an issue (Table 2, Figure 3).

Table 2. General Response for Data Repository Location of 1,275 WSEIDs

Response	WSEIDs
10 Proposed MMID	530
20 internal non-MM repository	94
20 no fish metrics	114
20 no repository	13
20 no repository identified	15
30 declined to participate	81
30 no response	17
40 CRITFC to review	404
50 data not yet collected	2
50 database under development	2
50 metric - WSETitle mismatch	1
50 project not in original rev	2

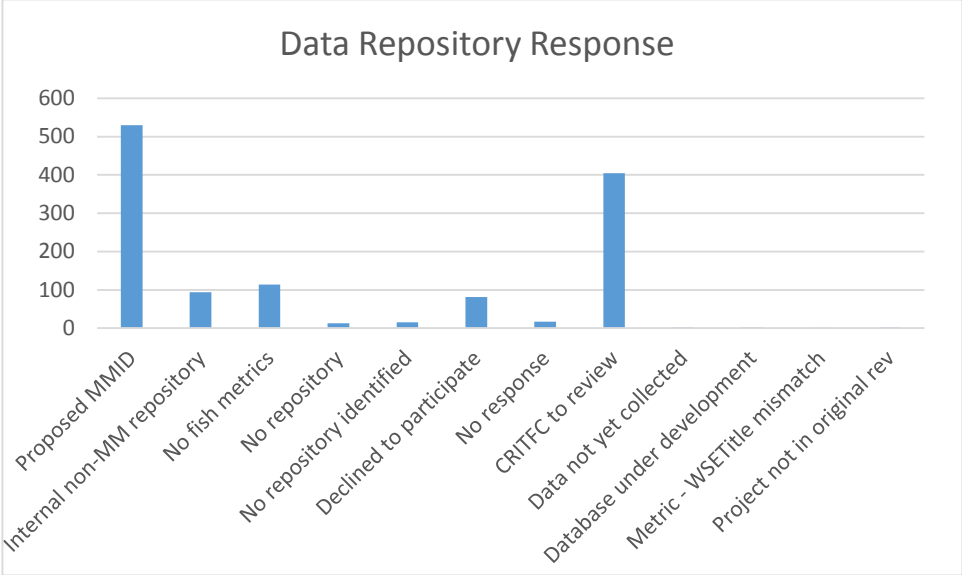

Figure 3. Data Repository Response (MMID=Monitoring Methods Repository ID; WSEID= Work Statement Element Identification Number)

The StreamNet database manager gathered the information and attempted to crosswalk the identified data repository location for 1275 potential Project, contract, and work element combinations (Table 3). During the process of inventorying data repositories, it became clear that improved early communication would help BPA and contractors prioritize locating and identifying repositories for their data. A final report on this project is expected in 2014.

Table 3. Summary of the number of WSEIDs associated with 47 Monitoring Methods Repositories

Data Repository ID	Title	# of WSEIDs
49	Avian Predation Project	4
50	BPA Fish and Wildlife publication page	167
53	Columbia Basin Baseline Water Quality	8
55	CRITFC Technical Reports and Research Website	2
58	DART - Data Access in Real Time	3
59	Data Basin	2
63	Fish Passage Center	26
64	Genetic Analysis of Pacific Salmonids (GAPS)	6
68	Idaho Fish and Wildlife Information System	69
69	IDFG Fisheries Technical Reports	89
73	PNAMP Monitoring Methods Website	3
77	Northern Pikeminnow Sport Reward Fishery Program Website	4
78	NONE - No data repository or not electronically available	124
79	Nez Perce Tribe Fisheries Resources Management Website	1
82	Stevan Phelps Allele Nomenclature (SPAN), NWFSC Oracle Collaboration Suite	1
84	NOAA Ocean Indicators Tool	4
91	PTAGIS Website	117
93	Lower Columbia River Estuary Partnership website	15
94	RMIS - Regional Mark Information System	51
95	WDFW Salmonid Stock Inventory (SaSI) & SalmonScape	9
97	SATURN - CMOP Science and Technology University Research Network	1
99	ISEMP - Integrated Status and Effectiveness Monitoring Program	11

Table 3. Summary of the number of WSEIDs associated with 47 Monitoring Methods Repositories		
Data Repository ID	**Title**	**# of WSEIDs**
100	StreamNet Data Store	85
105	USGS National Water Information System (NWIS) database	2
115	ODFW Hatchery Management Information System database	5
116	StreamNet Library	4
117	StreamNet Database	103
118	MFISH - Montana Fisheries Information System	2
120	Columbia Basin Water Transactions Program	20
123	Middle Fork (John Day) Intensively Monitored Watershed Reports	3
124	NOAA Salmon Population Summary (SPS) Database	13
125	ODFW Salmon and Steelhead Recovery Tracker	2
126	ODFW's Data Clearinghouse	92
128	CHaMPmonitoring.org	20
1138	Walla Walla Basin Watershed Council Website for Environmental Data	4
1144	Bird Research Northwest Data Portal	4
1148	Spawning Ground Survey Database (SGS)	4
1151	Hatchery Reform Science Program	4
1152	Upper Columbia Salmon Recovery Board Database	6
1153	FishBooks	7
1159	ODFW Fish Health Database	13
1161	ODFW Sturgeon Database	1
1162	UCM&E Database (Local Wenatchee Field Office Server	12
1163	WDFW Genetics Unit Database	7
1164	WDFW Scales Unit Database	6
1170	STORET	16
1172	FIS – Fisheries Information System (Montana)	15
1173	QCI Network Database	11

Identification of Management Questions and Strategies

A regional data management and coordination approach is necessary if the many data collectors in the basin wish to cooperate and share information. StreamNet serves this regional coordination function. Data managers from a diverse set of agencies and tribes are called together in regional forums to discuss topics of interest. These forums serve to identify data management questions that otherwise would be handled on an individual basis. Strategies can then be identified to address these questions and concerns, and data management considerations can be incorporated early in the development of monitoring plans and approaches.

The BPA Data Management Strategy identifies the StreamNet database and StreamNet DataStore as core data repositories. BPA's focus of funds is shifting to support specifically identified data repositories for certain data. BPA has agreed to support Data Stewards to capture data in the short term, and/or use programming resources to develop infrastructure to automate flow of data to improve efficiency and QA/QC in data storage and retrieval.

The Coordinated Assessments project is a result of the identification of a key deficiency in regional data management; the potential inability to share and compare information on fish populations across structural boundaries due to differences in data collection and management practices. This has generally required decision makers to establish individual networks of biologists and staff to ensure the flow of data needed to assess fish

populations. The CA project is designed to structure this flow so that it becomes standardized, automated, and sharable throughout the region; first on key VSP indicators, then expanding to other data as time proceeds. The BPA Data Management Strategy supports the Coordinated Assessment project to support sharing and proper management of data.

Documentation of Protocols and Methods

Protocols and methods used in the creation of data generally are documented through formal reports, at varying levels of detail, and for that reason StreamNet has always included the source documents for all data in the database in the StreamNet Library, with direct links to the documents from the actual data. With the regional recognition that protocols and methods described in reports are not always sufficient for fully understanding the origin and uses of the data, a tool to support full description of methods and protocols was developed through PNAMP with support from BPA. Use of this tool, www.monitoringmethods.org to describe sampling methodology is increasing, and StreamNet built a link to the website for the CA project to specify the protocols used to calculate the indicators and metrics. We are working to add similar capability to the Data Store and potentially the main StreamNet database in the future. Providing a link to protocols and methods could easily be added to the current links to data source documents in the main StreamNet database. This will require new work on the part of the StreamNet data stewards, however, so this will have to be prioritized in the future. Oregon StreamNet achieved a significant internal milestone by finalizing a simple metadata standard for the agency and obtaining support from top level agency administrators for its implementation across the agency. The development of formal metadata will greatly aid efforts to document the origin, protocols and uses of the data, including CA data and beyond.

Data Entry

Database development and management, including data loading and QA, was performed by PSMFC central staff and the project staff in the participating agencies in order to manage the data that are obtained, standardized and disseminated through the project. Data were obtained, loaded and quality checked, georeferenced, and converted to the DES for transmittal to the project database at PSMFC. At Bonneville's request, in 2013 StreamNet also initiated field trials of hand held data devices, to investigate their utility in facilitating more automated data flow of field level data. The StreamNet data store also has some built-in QA/QC features that will be expanded to support proper QA/QC practices to store published data sets.

Devices were purchased, a software vendor was contracted, and initial outreach conducted to field project sponsors to identify projects where devices will be tested in 2014. The StreamNet project will also attempt to develop automated means of capturing data from the source agencies for entry into the StreamNet database at PSMFC, to avoid the need for reentering data. Ultimately, the objective is to automate data flow to increase timeliness, data security, and improve the general efficiency of RM&E projects using this approach.

StreamNet currently utilizes centralized databases due to the current capabilities of agency infrastructure. A longer term goal is to support the agencies in development of internal data infrastructure that will allow automated data dissemination from the agencies via web services in regionally standardized format. Data were managed and stored at the subcontracting agency level to support this data entry/development process, and in the consolidated regional scale database at PSMFC, where the data are stored, managed and backed up for use through the StreamNet data query systems.

ODFW StreamNet acquired 32 datasets for population estimates from various contributions in the Columbia basin. This resulted in indicator estimates for 42 NOSA and 18 RperS populations in the Coordinated Assessments (CA) DES. The portion of this data that was ready for public distribution was exchanged with Regional StreamNet, along with trends originating from the BPA Inventory effort, priority species within the Columbia basin, QC information from StreamNet staff and linear referencing conducted on historic spatial data. Oregon also acquired and submitted new and updated existing juvenile count and estimate trends to StreamNet for testing.

Agency Data Storage

StreamNet maintains a central database containing summarized fish data for the Columbia Basin. BPA relies on the StreamNet database and StreamNet data store as a core data repository to secure public access to data where not provided in an alternative, publically accessible system. The StreamNet data store serves as the default database for numerous fish population metrics, as indicated in the BPA Data Management Strategy. In addition, StreamNet can function as the interim data storage location during the development of databases for new data sets, such as fish species genetics, blood work, and enzyme analysis. PSMFC also physically hosts other data storage repositories as a cooperator with state and tribal agencies. StreamNet staff now also work to ensure that data not located in the StreamNet database are secure and regionally accessible in other approved environmental data repositories. During 2013 StreamNet led an effort to identify exactly where such data was located by inventorying data repository locations for all Bonneville funded projects and contracts.

The StreamNet subprojects in the state agencies all contributed to development or improvement of agency data storage systems in 2013. Focus continues to be on increasing the speed and efficiency of data conversion to the regional standard StreamNet DES, and then submission to the StreamNet database. The long term goal is to develop the capacity for the agencies to host data in regional standard and share it via web services and/or to transfer data to StreamNet via web services. Since each state uses different approaches to their data management, actions taken by the state subprojects differed accordingly.

IDFG StreamNet staff assisted BPA project biologists to identify and prioritize data available for entry into the Idaho Fish and Wildlife Information System (IFWIS), or an alternative accessible, backed up information system. IDFG StreamNet staff participated in meetings of the Coordinated Assessments (CA) planning and development groups. They provided input prioritizing indicators, metrics, and metadata. They coordinated with development between the proposed DES, the prototype database and application, and the web service data exchange. Multiple sources of CA data were consolidated into complete, standardized, workbooks on a secure and backed up network drive. SQL queries were written to select, extract, and transform those data into the draft DES for NOSA and AR/S. IDFG staff wrote web service routines to enable the transfer of CA data to PSMFC and NOOAF databases. Those services were successfully tested and results shared with the CA Exchange Team. After appending into the IFWIS CA database, those data were then transferred to the PSMFC CA database. IDFG StreamNet staff compiled and submitted hatchery return data for 2012-2013 chinook, and 2013 steelhead and the 2013 chinook index redd counts.

MFWP StreamNet staff, in addition to maintenance and update of existing databases, assisted the Fisheries Division in continued scoping of the internal centralized fisheries data system being built by MFWP Application Development staff. StreamNet staff was involved to ensure that data being collected and stored conforms to existing StreamNet DES guidelines and that the exchange of data with the StreamNet central database is efficient. The system has been designed to replace individual databases residing on biologists' computers thus making truly centralized data a reality. In addition the system includes analysis tools giving the user the ability to calculate various population estimates and other metrics needed by staff for reporting purposes, which will benefit BPA projects. Staff assisted

in a training session for biologists and technicians, including those receiving BPA funds, on the use of the system focusing on data entry. StreamNet staff also developed a process which allows historic data files residing with individual biologists to be converted from one file type to another to allow for uploading into the new system. The end result is historic data will be available in the new system much sooner and with far less effort than anticipated. An additional task moving forward will be to investigate the potential to deliver data as web services. These efforts are leading to a significantly enhanced ability for MFWP to share fisheries data in standardized format with regional entities.

An additional, unanticipated task of moving all MFWP fisheries data from a SQL server to an FWP Oracle server had to be done during the contract period. The data was on a failing server and it was imperative that the data be moved to a secure location. An additional result is that all MFWP fisheries data is contained on one central server which will allow for streamlined future development and a more stable infrastructure.

ODFW StreamNet performed routine maintenance and updates on existing core databases. In addition, efforts to improve overall agency data storage and flow from the field continued by ongoing development and maintenance of the ODFW Data Clearinghouse (DC), making Oregon's natural resource information more secure and accessible by providing a centralized storage and distribution service. StreamNet staff worked with ODFW Recovery Plan staff throughout the year to get CA data onto the ODFW Salmon & Steelhead Recovery Tracker and to standardize field names from originating datasets with files that are downloaded from the Recovery Tracker. We also enhanced the data structure and user interface for Oregon's Trend database to more efficiently address Coordinated Assessment data needs, and to accommodate juvenile and resident data requirements.

WDFW focused some SN resources on the building, testing and refinement of several systems to store data captured from field biologists and analyzed by regional biologists. Systems under development and implementation include Adult Age and Scales; Traps, Weirs & Surveys; Spawning Ground Survey; and Juvenile Migration databases. These systems are being developed with the intent of holding BPA project data in a secure and transferable location and informing the Coordinated Assessment indicator data sets as well as the standard StreamNet data sets. These data sets are being prototyped at WDFW headquarters and in Washington's Lower Columbia Region, but will eventually be rolled out to other regions statewide. Additionally, WDFW has been concentrating resources when available to the development of our Salmon Conservation Reporting Engine (SCoRE) which will enable on-demand data access via services from the data.wa.gov open data platform. Contingent on funding, we anticipate further development of these and other systems in 2013.

The USFWS StreamNet project continued to benefit from the fact that most data from the national fish hatcheries in the Basin are already managed in the centralized CRiS database, making conversion to the StreamNet DES format straightforward. No additional work was done to support FWS data storage by this StreamNet subproject.

Regional Sharing

Regional sharing of fish management data is StreamNet's primary purpose. In 2013, significant effort was expended to improve sharing of the Coordinated Assessments indicators and metrics. StreamNet led the team that developed

the Data Exchange Standard for the project, and developed an initial database to contain any data that the state and tribal agencies will be able to provide. The DES specifically identifies the data elements that are to be shared for each of the four indicators, along with definitions, formats, and units for each element. The DES will initially be used to guide the organization of data to be shared via any specific medium, whether by spreadsheet, CSV file, database file, or web service. Ultimately, the project envisions the data elements being hosted by the originating agency in DES format and shared via web services that can be accessed by an exchange network hosted by the Environmental Protection Agency (EPA).

StreamNet also continued its role as a primary data sharing project in the Columbia Basin, providing ready access to the data types listed in Table 2. These data have traditionally been created and managed internally by the region's state, tribal and federal fish management agencies or programs, and have not been shared widely in a consistent format, except through StreamNet. We maintained and updated a central database containing these data and then shared the data through the StreamNet website. Each StreamNet sub-project compiled state or agency specific data for the data categories and submitted them to the central database at PSMFC to add the most recent data. The flow of updated data of these types was impacted by the prioritization of the CA project in 2013.

The data shared through StreamNet become available to support a variety of important activities in the Basin. Fish distribution data was used by developers, consultants, universities, land management agencies and fish management agencies for environmental assessments, research and land management planning. Adult abundance data are necessary for the calculation of spawner abundance and spawner recruit rates, which are key inputs to high level indicators and population assessments. Hatchery return data were used in the calculation of spawner abundance and spawner recruit rates. Age composition of adult returns was used in the calculation of spawner recruit rates.

A wide variety (Table 2) of data types primarily related to fish were disseminated through the StreamNet website at www.streamnet.org and by the agency subcontractors. We provided several data query approaches used to locate, display and download data from the StreamNet main database for standardized data and from the Data Store database for data that do not conform to the StreamNet DES (Figure 1).

The standard data query utilizes a tabular approach for requesting and viewing or downloading data from the main database. An interactive map application allows location of data from the main database by navigating to an area of interest, then using a 'get data' tool to view and download all data that are associated with features at that location, such as for a stream, county, HUC or hatchery. GIS layers and maps are also available.

The Integrated Query System (IQS) integrates both tabular and map based query approaches into a single system. This allows viewing and obtaining data within multiple data types by filtering or sorting on column headings in a table and also selecting on a location basis by using a map query. The IQS was designed specifically so that additional data types can be added to the same query approach easily in the future, and it may be able to serve as a consolidated platform for sharing many kinds of data across the basin.

The Data Store online data archive provides access to non-standardized data from any source, within or outside the StreamNet project, in native format. The Data Store serves as an approved environmental data repository for a wide variety of data collected in the basin, maintaining security and accessibility long term. The Data Store interface allows data producers to upload their data sets for secure storage and dissemination along with descriptive metadata. The BPA Data Management Strategy directs StreamNet to store links associated with tagging protocols and designs to ensure data used by third parties understand proper uses of data retrieved by third parties. The Data Store upload procedure obtains project information directly from the BPA Taurus database through www.cbfish.org,

and additional links with Taurus and www.monitoringmethods.org are planned. StreamNet data and metadata were provided online as web services, allowing users to locate and obtain data through automated means such as national or regional clearinghouses, and in fact, the new IQS harvests our own web services as part of the new, more efficient approach to querying our data.

In 2013, StreamNet used Oregon's CA data submission to test the web services data exchange between the StreamNet Database and NOAA Fisheries SPS Database.

Analysis and Reporting

The StreamNet project displays and provides online access to all legacy data and data updates as soon as they are received from the source agencies, quality checked and validated, and disseminated through the various data query systems. Annual time series data are presented as 'trends', while other data sets are updated on a less regular basis as the agencies generate new information, such as for distribution, facilities, diversions, and barriers. Trend type data disseminated through the StreamNet website, such as various fish counts and abundance estimates, are summarized on an annual basis by the StreamNet data technicians working within the data source agencies. StreamNet is a data sharing and reporting repository, so further analysis is not our purview. Where derived data, such as estimates of spawning populations, are disseminated through the project, they are obtained from the source agencies for inclusion in the project's data systems.

Data from the StreamNet database are made available through the online data query systems (Figure 1). During 2012 we initiated planning with NOAA Fisheries to develop automated means of feeding indicators and metrics from the Coordinated Assessments project to the Salmon Population Summary (SPS) database. During 2013 we continued discussions with NOAA and state and tribal management agencies, with the intent of assisting them in automating data flow for their decision making needs.

In 2013 updates to these standard data types were largely put on hold in order to focus on the CA project. The CA project is directing StreamNet's focus to the key indicators and metrics that have been identified as priorities for reporting progress on implementation of the FCRPS Biological Opinion (BiOp). The data will be published online as part of the EPA grant StreamNet is implementing with our partners. Reporting on the progress of the CA project is part of the EPA grant.

StreamNet periodically issues reports on topics of interest to various users, as staff time is available. These include reports on the geographic distribution of fish, fish marking and hatchery releases, and other topics for which StreamNet holds data, or where StreamNet can serve a facilitating role with other PSMFC projects and databases.

As a BPA funded project, StreamNet regularly issues required reports through Pisces and cbFish. In 2013 these included the 2012 annual report, 2013 and 2014 quarterly progress reports, and the 2012 BiOp report. At BPA's request, in 2013 StreamNet also undertook a project to inventory data repository locations by BPA project, contract, and work element. This project was underway at the end of the calendar year. Results are anticipated in 2014.

4. Synthesis of Findings: Discussion/Conclusions

In 2012 StreamNet received significant input from the NPCC and BPA. Among their recommendations were:

- Data management should focus on addressing priority data needs. Specific guidance for StreamNet included;
    - Focus on a number of additional priority data types, including Coordinated Assessments indicators and supporting metrics and juvenile abundance data, and SNPs genetics data
    - Assess the security and accessibility of data developed by BPA funded projects
    - Participation with integrating data discovery through MonitoringResources.org.
- Increased coordination among database projects is needed to avoid potential redundancy.
- Expanded use of information technology is needed to improve efficiency in data management and sharing.
- StreamNet should take on work with and dissemination of a number of additional priority data types. These included the CA indicators and supporting metrics, information on security and accessibility of BPA funded data, juvenile abundance data, resident fish data, SNPs genetics data, and data coordination through MonitoringResources.org.

During 2013 many of these instructions were carried out and have been reported in the Results section of this report. In completing those tasks, a number of lessons have been learned. StreamNet has for years provided access to updated trends (time series of data) and other traditional data sets, serving as a secure repository and the only publicly available source for these data in regionally standardized, georeferenced format. However, these datasets are generally not used by decision makers in real time. Comprehensive use of this data has already been made at the state, tribal, and federal agency level for decision-making and for population assessments, generally prior to posting on StreamNet. The higher level assessments that are derived from this data have not historically been posted on StreamNet. The StreamNet database has largely served an archival and a public access function, and has not been used by decision-makers as the source for data during decision-making processes.

A lesson learned has been that StreamNet cannot continue to serve an archival role to ensure safekeeping of large volumes of data while also focusing efforts on CA and key VSP indicator information in such a way that it helps regional decision makers, ultimately in real time. Decisions must be made about prioritization relative to keeping the flow of traditional StreamNet data current within the StreamNet data base, and/or making CA data relevant to decision makers in real time. Given existing resources StreamNet cannot serve all of these functions simultaneously. The current focus on the CA project means that traditional StreamNet datasets will not be updated and will lose their utility over time.

Cooperating subcontractors have made use of assets provided by BPA through the StreamNet program to build infrastructure that contributes directly to their own decision-making capability, to degrees that vary from agency to agency. In general, agencies that have made the development of a centralized data management capability a priority have integrated StreamNet staff into their programs, and effectively use the staff to both feed data into the StreamNet database and to complete their own internal data management priorities. In general, agencies that have a more dispersed data management process use StreamNet staff primarily to feed data into the StreamNet database. Other staff separately and independently manage data for decision making. StreamNet has started discussions with agency partners on how best to deploy program assets within agencies, with the goal of simultaneously assisting agency decision-makers and assuring data security and regional sharing of data.

One of the lessons learned in this project has been that embedded data management staff paid for through the StreamNet project serve an important and often unrecognized role within the agencies. So long as the flow of traditional data, and now CA information has continued, agencies have been free to structure their data systems and use embedded staff in any structural assemblage that works for them. While this flexibility can be an asset, it is incumbent on the program to ensure that these assets are deployed to best implement regional RM&E programs. During the next year, StreamNet staff will focus on aligning the program with regional RM&E by reaching out to higher level leaders in the state and federal agencies on a regular basis. The intent is to have an informal strategic guidance group to inform the work of the StreamNet Steering Committee in future.

When the updating of traditional data sets was postponed in 2012 in favor of focusing on the high level indicators selected in the CA project, staff time at PSMFC was adjusted to focus on developing the DES and database for Coordinated Assessment indicators and metrics. New funding was applied for to help fund the CA project and data sharing. At the close of 2013 this funding, in the form of a $500,000 grant from the EPA to WDFW, was imminent. One lesson learned is that additional sources of funding to improve data sharing and infrastructure are available, and should be sought out to supplement the essential funding provided by BPA. BPA, while funding the majority of projects that collect fish metric data in the basin, does not fund all of this work. Combining resources at the state, tribal, and federal level can lead to more effective and comprehensive RM&E management in the future. Another lesson learned during the CA Project is that DES changes should be made on a routine, possibly annual basis, to allow data managers to adjust systems and processes prior to initiating further compilation and delivery efforts.

During the process of inventorying data repositories, it became clear that improved early communication would help BPA and contractors prioritize locating and identifying repositories for their data. A dedicated technical meeting hosted by PSMFC and/or BPA to iron out the details is recommended on projects such as this in future, before work gets underway. StreamNet staff recommends that Bonneville clearly include expectations for the location of approved repositories through the contracting and reporting process. All contractors collecting RM&E data should identify approved repositories as part of their project planning. Tools such as drop down menus in Pisces that link approved repositories to individual work elements would help contractors, BPA, and data users keep track of the large volume of information collected annually. Another lesson learned may be that StreamNet could serve as a coordinator to assist BPA in identifying and publicly listing the data repositories for project information, as well as serving as a repository for data through the StreamNet data store.

In implementing the CA project, substantial progress has been made in 2013. However, the caveats identified in 2012 remain an impediment that will impact the region's ability to implement more efficient data flow to decision makers. The indicators are not calculated for all defined populations. Many indicators, particularly those related to productivity, are calculated for far fewer populations than others. Indicators are not always calculated to represent an entire population. The various state and tribal agencies are at significantly different stages in developing the capabilities of their data management infrastructure, so developing a region-wide approach to sharing these indictors will continue to require more time and/or more resources for some agencies. One lesson learned through this project is that the existing system of decision making is reliant on a small, core network of biologists with a long history and significant institutional knowledge that is largely irreplaceable. As these professionals retire, a more automated and documented system will be essential to assure continuity of population assessments. Projects such as StreamNet could serve a key role in assuring that this documentation and the data needed to inform the assessment process is accessible and stable during any upcoming transition.

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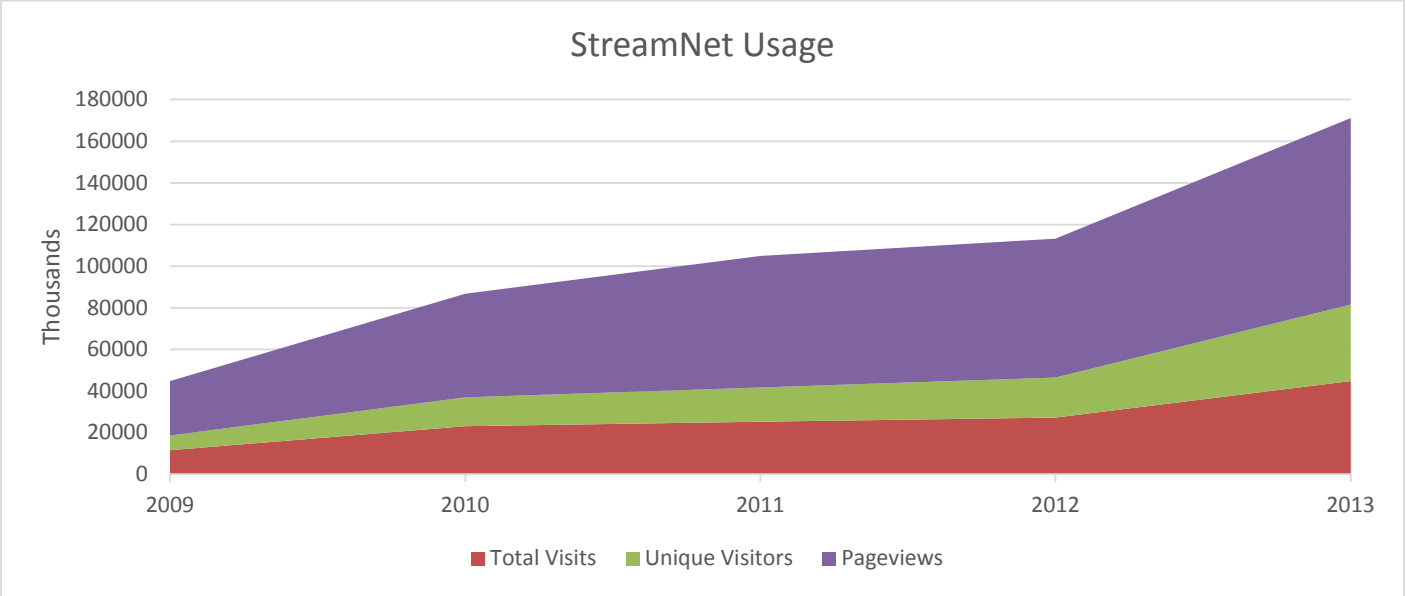
Appendix A: Use of Data & Products



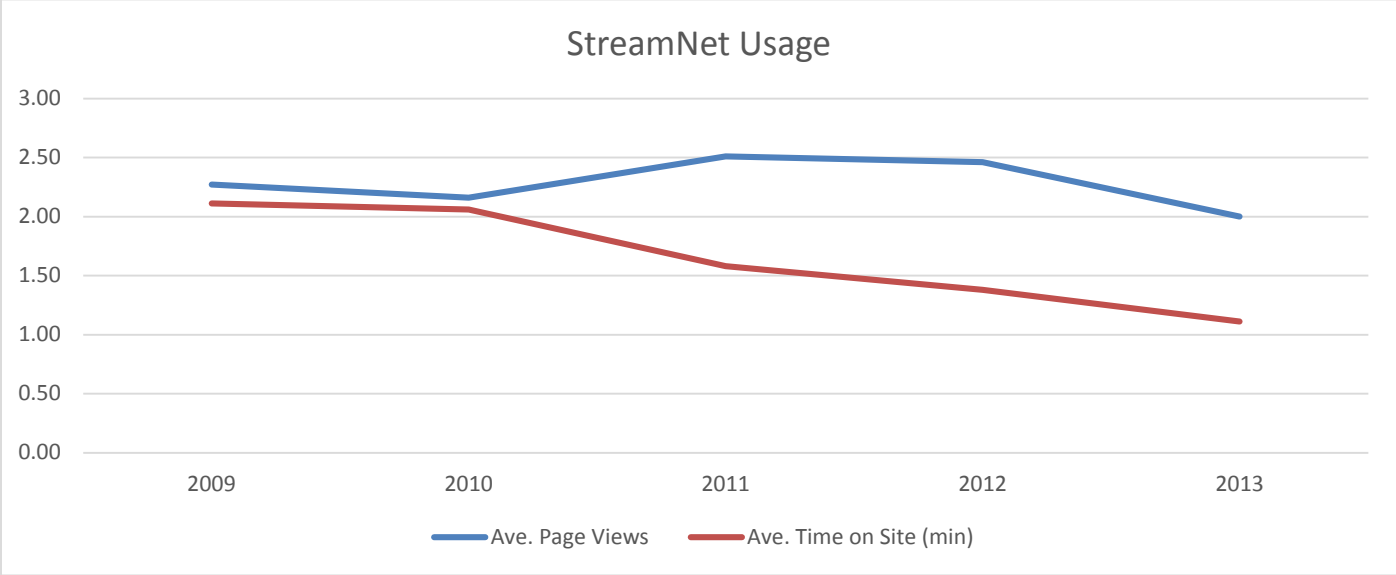


Table 1. Annual use of the StreamNet website	2013	2012	2011	2010	2009
Total Visits	44798	27163	25169	23,029	11,578
Unique Visitors	36683	19291	16586	13,924	6,983
Pageviews	**89681**	**66686**	**63186**	49,725	26,261
Ave. Page Views	**2**	**2.46**	**2.51**	2.16	2.27
Ave. Time on Site (min)	**1.11**	**1.38**	**1.58**	2.06	2.11

StreamNet Website Use Statistics (Continued)

Table 2. Top users of the StreamNet website (no. of visits)	2013	2012	2011	2010	2,009
Internet service providers (Comcast, Verizon, etc.)	17711	12515	4200	8,369	2,530
State of Oregon	600	961	881	974	594
Headquarters USAISC (US Army)	462	342	96	515	277
U.S.D.A. Forest Service	393	443	0	593	339
National Oceanic and Atmospheric Administration	309	385	144	572	306
Washington School Information Processing Cooperative	274	229	0	89	65
Bonneville Power Administration	220	258	141	296	150
Oregon State University	186	152	40	148	64
USDA Office of Operations	148	130	58	244	201
U.S. DOI Bureau of Land Management	139	186	81	155	95
State of Idaho	120	132	63	166	128
Province of British Columbia	115	69	0	0	0
U.S. Fish and Wildlife Service, IRM/BFO HQ	109	182	111	262	185
Bucks County Intermediate Unit #22	104	0	0	0	0
Parametrix Inc.	104	0	0	0	0
US Department of the Interior	99	0	0	0	0
University of Idaho	96	0	0	0	0
University of Washington	91	109	24	169	70
Washington State Department of Fish and Wildlife	89	156	36	584	261
HDR	75	82	18	58	61
Portland State University	73	88	0	55	39
State of Montana	67	75	8	102	45
North Carolina Research and Education Network	67	0	0	0	0
Ch2m Hill Inc.	62	65	0	0	0
National Wetlands Research Center, USGS	59	82	23	70	38
University of Oregon	54	87	37	134	8

Appendix B: Detailed Results

StreamNet Annual Report Details - Calendar Year 2013

A Support transfer of data into secure and accessible repositories

Provide archive - Data Store 160. Create/Manage/Maintain database

Deliverable: The Data Store data submission procedure in improved and more efficient and is increasingly used as an archive for unstructured data, particularly from BPA project sponsors. The Data Store tools integrate with mm.org and cbfish.org.

PSMFC Additions to the Data Store's Data Publishing Service (DPS) were made to better integrate with BPA-funded information management systems and more easily capture BPA-specific project information. These include: 1) When adding a new data set the DPS prompts the user for a BPA project number. If one is provided then the DPS retrieves appropriate information from Taurus and from www.monitoringmethods.org, and pre-populates this information in the system. 2) The information pre-populated is made available when the user is providing methods. 3) The system fetches additional data from www.monitoringmethods.org when the asked. 4) The information collected is searchable and shown when a user is searching for data set in the Data Store.

Support transfer of data into secure and accessible repositories 159. Transfer/Consolidate/Regionally Standardize Data

Deliverable: StreamNet participants assist sponsors in securing data in appropriate repositories, as requested. Data are stored in appropriate repositories.

CTCR We continue to identify CTCR groups that have BPA funding and connect them with appropriate data repositories as needed. Discussions are ongoing as new projects begin, and referrals are made to the StreamNet datastore and PSMFC when appropriate.

IDFG IDFG StreamNet staff assisted BPA project biologists to identify and prioritize data available for entry into the Idaho Fish and Wildlife Information System (IFWIS), or an alternative accessible, backed up information system.

MFWP The BPA project inventory was completed during the second quarter of the FY13 contract period. An in-depth look at each project and data collected was conducted by Montana StreamNet staff. Data that was appropriate for inclusion into internal MFWP centralized databases was entered into those databases and quality checked. Data for which a StreamNet DES exists was exchanged in the appropriate DES format. For data where no DES existed the data set was submitted to the StreamNet Data Store. StreamNet staff assisted BPA project biologists to identify and prioritize data available for entry into FIS.When the BPA data inventory was completed the Fisheries Division asked StreamNet staff to do an inventory of all Columbia basin fisheries data and assess the status of historic data in centralized databases in an effort to prioritize data entry.

ODFW ODFW coordinated with PSMFC staff, WDFW, and IDFG to organize and assign projects for individual state responsibilities and assisted with the development of the data inventory template used for data compilation. Staff facilitated the transfer of data into accessible repositories when needed, captured and uploaded StreamNet applicable data into the DES format if not already captured, and conducted a formal assessment of data security and accessibility by interviewing project sponsors. ODFW aided 3 project sponsors with data security by directing 2 ODFW projects to the ODFW Data Clearinghouse and 1 non-ODFW project to the StreamNet Data Store, completed a full inventory of 55 Oregon BPA funded projects, submitted a final summary report to PSMFC-StreamNet, and captured priority StreamNet trend data from 8 project sponsors.

PSMFC Inventoried BPA sponsored projects collecting fish data to assess where the data was being backed-up, recommended appropriate Environmental Information Repositories for most non-tribal projects that cooperated with us, and prepared reports detailing the work accomplished.

USFWS A lack of cooperation from identified projects precluded action on this item.

WDFW The second and third quarters of FY13 were spent on inventorying BPA data and ensuring or providing access to secure storage.

Phase I of the inventory was started and completed. Training for BPA project sponsors was given in Yakima to help them with securing and backing up of their data. An initial review of 118 projects was completed by the Upper Columbia StreamNet Data Manager. BPA project/contract sponsors identified as having "Fish" metrics were contacted. Formats and storage locations of raw and derived data and backup files were determined and placed into a standardized format for submission to PSMFC for integration with other states data.

Lower Columbia Data Manager also contacted BPA funded projects in the Lower Columbia and obtained their information. Training was given at the Region 5 Vancouver office for BPA project sponsors to help them with securing and backing up of their data.

Of 115 assigned BPA projects, 79 projects with associated contracts were reviewed, compiled and submitted to PSMFC for integration into a master format for steering committee review.

B CA data - coordination

CA data - coordination 189. Regional Coordination

Deliverable: StreamNet, at all levels of the project, coordinates with all participants in the Coordinated Assessments project, including participation in the CA core team and planning group, leadership of the DES Development Team, leadership of the technical aspects of the project, and overall project participation and coordination.

CTCR The Data Steward and others have participated in all Coordinated Assessment Activities.

IDFG IDFG StreamNet staff participated in meetings of the Coordinated Assessments (CA) planning and development groups. They provided input prioritizing indicators, metrics, and metadata. They coordinated development between the proposed DES, the prototype database and application, and the web service data exchange.

ODFW Oregon StreamNet continued to participate in CAPG, Natural Production and Hatchery indicators DES Development Teams, XCT team, and StreamNet Technical Committee meetings, along with state and other regional discussions related to CA data flow to facilitate coordination of CA efforts. ODFW also began detailing a work plan for the pending WDFW EPA grant.

PSMFC StreamNet staff served on the CA Core Team, Planning Team, Natural Origin and Hatchery Indicators DES Groups, and XCT team, providing leadership and/or staff in most cases. Served as a proposed subcontractor under the pending WDFW EPA grant.

WDFW WDFW StreamNet staff continued to participate in the CAX Core and technical coordination meetings as well as attended CAPG meetings with the intent of keeping them updated. WDFW continued internal development of systems with the intent to deliver information to the CAX. WDFW subcontracts for OR and PSMFC have been tendered.

C CA data - DES and database

CA data - DES and database 160. Create/Manage/Maintain database

Deliverable: The CA DES is maintained and updated to include new indicators and their supporting metrics and metadata, and CA data are loaded and QAd in a conforming database.

CTCR CTCR participated in ongoing development of the CA DES including the Hatchery Indicators group.

IDFG IDFG StreamNet staff contributed much input to the development of the CA DES based upon the natural population indicators, and working closely with IDFG hatchery and research staff. Those developments were implemented in the prototype High Level Indicator (HiLI) database and application.

ODFW Oregon StreamNet staff participated in and contributed to discussions during technical committee meetings, planning groups, hatchery working groups, and various forum and email correspondences pertaining to Coordinated Assessments (CA) DES related tasks. Oregon coordinated with Regional StreamNet and state partners to develop a database for exchanging the four CA DES indicators. Database updates and maintenance continued throughout the year, while simultaneously coordinating with State data analysts in NE Oregon and the Willamette-Lower Columbia. Staff developed and provided look-up tables, quality assurance queries, and population table schemas to share database structure and development ideas with StreamNet staff and state partners.

PSMFC A SQL Server database was created containing the three tables defined in the Coordinated Assessments Data Exchange Standard dated November 1, 2012 to convey four salmon and steelhead population (VSP) indicators: including natural origin spawner abundance, natural origin smolt to adult return ratio, and natural origin recruits (adult and juvenile) per spawner. The database also includes tables containing lists of appropriate species, runs and populations. An Access database version of the Coordinated Assessments database was also created and shared with compilers and interested parties.

PSMFC Formed teams and provided leadership for natural origin and hatchery DES groups. The DES tables for natural origin fish indicators were updated in fall 2013. Work began November 2013 (and continued into 2014) to add indicators for hatchery programs. The hatchery program indicators selected were 1) number of fish spawning, 2) a measure of the relative influence of natural-origin and hatchery-origin fish (proportionate natural influence, "PNI") in integrated hatchery-natural populations, 3) egg-to-release survival rates, 4) smolt-to-adult return rates, and 5) recruits per spawner.

WDFW Work began in the third quarter of FY13 for identifying data sources for Coordinated Assessments in the Columbia Basin. Internal WDFW discussions started about statewide protocols for transfer of associated data to appropriate state and StreamNet data bases. Contact with appropriate WDFW Region 5 staff were initiated to work on populating CA tables and data flow.

D CA data - compile data

CA data - compile data 159. Transfer/Consolidate/Regionally Standardize Data

Deliverable: All available CA indicators and metrics are obtained, updated, converted to the DES format, and exchanged with the CA database.

CTCR Data measurements have been compiled and Indicators and metrics determined for some of the NOSA Indicators.

IDFG Adult Recruits Per Spawner (AR/S) data were compiled and exchanged with CA database. Draft data for chinook productivity estimates from 1957 to 2006 were uploaded as a test. Steelhead and sockeye AR/S data were compiled but are not ready for exchange.

IDFG IDFG StreamNet is not yet prepared to exchange Juvenile Recruit Per Spawner data.

IDFG The Smolt to Adult Survival Rate (SAR) were compiled for 1962-2008 chinook. We cannot currently do steelhead by population, but that may change with advances in genetic sampling and analyses. We are unsure about the sockeye SAR estimates from trap to trap, since they may not be applicable to the whole population.

IDFG Natural Origin Spawner Abundance (NOSA) data for chinook populations from 1957 to 2012 were exchanged with the CA database. Steelhead and sockeye data were compiled, but are not ready for exchange.

ODFW ODFW StreamNet acquired 32 datasets for population estimates from various contributions in the Columbia basin. This resulted in indicator estimates for 42 NOSA and 18 RperS populations in the Coordinated Assessments (CA) DES. However, only 16 NOSA and 2 RperS population estimates were exchanged because the remaining populations were not ready for distribution. Staff coordinated closely with State data analysts in NE Oregon and the Willamette-Lower Columbia throughout the year to interpret and compile the indicators and metrics into the DES. PSMFC StreamNet used the submission as draft sample data for the data exchange via web services between the StreamNet Database and NOAA Fisheries SPS Database.

WDFW In FY13, no "final" indicators with point estimates, confidence interval and variance were available to be converted to the DES format. Processes were set up for the collection of raw data using data collection technology, standardization of forms, and data collection and analysis protocols. These processes have now created the basis for creating indicators for NOSA. Analysis code using R and Winbugs is being used to call on known databases containing the measurements to produce the desired outputs.

E CA data - automated data exchange

CA data - automated data exchange 160. Create/Manage/Maintain database

Deliverable: Initial automated feeds of CA data to the CA database are implemented and evaluated for effectiveness, and automated data feeds to NOAAF are initiated.

IDFG IDFG staff wrote HTML5 web service routines to enable the transfer of HiLI data to PSMFC and NOOAF databases. Those services were successfully tested and results shared with the CA Exchange Team.

PSMFC A view was created to extract 35 elements from Coordinated Assessments tables to enable a web service to automatically provide them to the Salmon Population Summary database. The following preliminary data was manually loaded into Coordinated Assessments tables from Access databases: 817 NOSA records & 727 RperS records from IDFG, and 239 NOSA records & 63 RperS records from ODFW.

PSMFC A REST web service was developed to feed the SPS subset of Coordinated Assessments data to NOAA. The web service is operational and available and the URI has been made available to Jeff Cowen (the programmer) at NOAA.

CA data - assist agencies enhance data flow 160. Create/Manage/Maintain database

Deliverable: Data flow to CA calculations is improved so that indicators can be calculated for more populations and speed is enhanced.

IDFG Multiple sources of HiLI were consolidated into complete, standardized, workbooks on secure and backed up network drive. Sequel queries selected, extracted, and transformed those data into the draft DES for NOSA and AR/S. After appending into the HiLI database, those data were then transferred to the PSMFC HiLI database.

F CA data - dissemination

CA data - dissemination — 161. Disseminate Raw & Summary Data and Results

Deliverable: The CA indicators, metrics and metadata are available for public viewing and download through the StreamNet data query systems and as web services.

PSMFC Data categories for Coordinated Assessments tables have been added to the StreamNet Online Data Query. Activation of the new data categories is pending finalized rules for data viewing and use (data use agreements).Web services to access Coordinated Assessments data are active and available.

G Compile data

Base data compilation - Hydrography — 159. Transfer/Consolidate/Regionally Standardize Data

Deliverable: State hydrography layers, including streams and lakes, are maintained and updated as necessary.

MFWP Hydrography was maintained throughout the year due to its utility as a core GIS layer for data quality assurance. Database and GIS scripts were developed and utilized to automate the labor intensive process of updating associated dependencies when waterbody information changes occur in MFWP systems.

ODFW ODFW obtained National Hydrography Dataset (NHD) data at both the subregion level (3rd field hydrologic unit) and subbasin level (4th field hydrologic unit). Staff then migrated whole stream routes (WSR) to Hydrography Event Management (HEM) tool compliant event feature classes on the NHD. Staff also conducted quality assurance checks on the data and identified errors in the output data, and worked to correct errors and revise data processing workflows. NHD Flowlines were edited to improve support for WSR's that meet StreamNet business needs. Staff resolved cross-agency conflicts with proposed edits and synchronized WSR events with updated NHD Flowlines.

WDFW The Location Data Manager started rebuilding existing python programs (py) per the new python software (arcpy) for lake and stream catalog hydrography management. The stream catalog hydrography is a major tool for understanding how WDFW data relates to any official WDFW hydrography of the moment. We continued to improve the lake layer with cross-references to NHD and improved names based on biologist feedback. Also, spurred by a data request, georeferenced select historic releases and scoped what it would take to finalize the entire historic dataset. It would be fairly easy (controversy free) to georeference the oldest release data (before 1982) because it carried less attributes so less conflicting clues. We cross-referenced 34,000+ of our 42,000+ lakes to NHD based on an intersect of 90% or higher. No errors were found in the cross-reference. We learned that you could easily cross-reference the remaining 8,000 by intersecting an inside point of the lakes layer with the NHD polygon and vice versa. Although we expect errors via this method it will provide a display for future proofing of the cross-reference AND a selection tool to indicate further proofing and polygon editing is needed in one of the sources. We will run and populate these extra cross-references when WDFW is geared to spend grant money received to edit the polygons. Continued efforts were made to improve the lake layer for unnamed lakes and contradictory names teased out of WDFW's effort to post more data of interest on their Fish Washington website. In earlier quarters we focused on lowland lakes while this quarter focused on high elevation lakes. As such, also worked closely with the Trailblazers who cooperatively release fish in high elevation lakes. We started cross-referencing the Trailblazer release dataset with the WDFW release dataset to identify missing records and insure the QC when populating the lake names.

Lower Tier data - barriers, distribution and 'other' data — 159. Transfer/Consolidate/Regionally Standardize Data

Deliverable: Data not conforming to the StreamNet DES are uploaded to the Data Store.

MFWP Data was migrated for use in statewide analysis

ODFW No work was conducted during the year as staff focused on higher priority data and other BPA priorities.

Tier 2 data - compilation 159. Transfer/Consolidate/Regionally Standardize Data

Deliverable: The Tier 2 data sets are updated as time and staffing allow, following completion of the CA data exchange.

IDFG IDFG StreamNet staff compiled and submitted hatchery return data for 2012-2013 chinook, and 2013 steelhead.

IDFG Compilation and delivery of estimates of spawning population data was not completed due to it being a lower priority than the BPA Data Repository Survey, CA HiLI development and delivery, and submission of higher priority data like redd counts and hatchery returns.

IDFG IDFG StreamNet staff helped collaborators enter, QAQC, and then compiled and submitted the 2013 chinook index redd counts.

IDFG Compilation and delivery of spawner count data was not completed due to it being a lower priority than the BPA Data Repository Survey, CA HiLI development and delivery, and submittal of higher priority data like redd counts and hatchery returns.

IDFG Compilation and delivery of weir count data was not completed due to it being a lower priority than the BPA Data Repository Survey, CA HiLI development and delivery, and submittal of higher priority data like redd counts and hatchery returns.

IDFG Results of fin ray analyses were linked to the samples' carcasses in the spawning ground survey database for display of individual fish ages. Run based age composition analyses were not complete at the time of hatchery return compilation and submittal. Those data will be delivered when they are available from IDFG fisheries research.

ODFW In FY-2013, ODFW submitted 921 trend updates and 62 new trends containing 2,139 EscData records to StreamNet online query system. Trend updates originated from the BPA Inventory (data capture milestone), site specific abundance data for recovery populations associated with Coordinated Assessments, priority species within the Columbia basin, QC information from StreamNet staff and linear referencing conducted on historic spatial data, including 303 John Day basin spring Chinook and summer steelhead survey locations. By the end of CY-2013, staff had updated an additional 140 abundance trends and added 26 new trends related to recovery populations and BPA funded project data. These data will be submitted in FY-2014. Staff obtained CTWSIR spring chinook and pacific lamprey GIS observation data, completed minor updates to anadromous salmonid distribution data and initiated migration of resident fish distribution data to the National Hydrography Dataset.

USFWS Data was compiled and QA/QC procedures performed for Return and Age data for all participating hatcheries.

WDFW No attempt to update any of the datasets in FY13 was made due to the emphasis being placed on implementing the process to populate the CA DES. All effort was placed on standardizing sampling protocols, forms, data entry, backups, processes and training.

Tier 3 Juvenile abundance - compilation 159. Transfer/Consolidate/Regionally Standardize Data

Deliverable: Initial juvenile abundance data sets are compiled and initial exchange is made to the StreamNet database at PSMFC in DES format as possible with existing staffing and if other data priorities are met first.

CTCR No work was conducted during the year as staff focused on higher priority data and other BPA priorities.

IDFG IDFG StreamNet staff continued to support the IDFG Juvenile Trapping (Jtrap) application and database for our collaborators. We participated in a PTAGIS coordination and update meeting to share current and future needs and capabilities between the two databases. Data continue to be compiled in the IDFG Jtrap database by collaborators.

MFWP No work was conducted during the year as staff focused on higher priority data and other BPA priorities.

ODFW After the StreamNet DES was modified to capture juvenile abundance data, ODFW StreamNet drafted a juvenile abundance data plan to locate, determine availability, and assess methods of acquisition for juvenile abundance datasets within the Columbia Basin of Oregon. Staff determined sources and availability of juvenile trend data and made contact with biologists. ODFW acquired and submitted to StreamNet for testing, 13 new and 29 updated existing juvenile count and estimate trends for recovery populations and BPA projects within the Interior Columbia domain.

Tier 4 Resident fish abundance - compilation 159. Transfer/Consolidate/Regionally Standardize Data

Deliverable: Initial resident fish data are exchanged with the StreamNet database in DES format as possible with existing staffing if other priorities are met.

MFWP Resident fish distribution data was updated, quality checked and exchanged with StreamNet in DES format.

H Data exchange standards and database

Tier 2 data - DES and database 160. Create/Manage/Maintain database

Deliverable: The StreamNet DES for Tier 2 fish abundance data is maintained and data are loaded into the StreamNet database and quality assured as they are received.

CTCR There was no Tier 2 data.

IDFG IDFG StreamNet staff participated in technical committee discussions to update and enhance Tier two data exchange standards (DES).

ODFW ODFW participated in impromptu StreamNet discussions to consider the addition of codes and conventions to fields in the StreamNet DES. ODFW proposed adding a SampMethID code for "fyke trap", CalcMethID codes for "video count" and "estimation based on video count", and a LifeStageID code for "adults & juveniles". These codes were added in 2014, after the end of this reporting period.

PSMFC No StreamNet Data Exchange Standard changes were officially adopted (published) during 2013. This was at least partially due to StreamNet project priorities being on Coordinated Assessments data types. Data Exchange Standards for those tables were developed instead. StreamNet DES changes that were accepted and set in motion for later formal adoption were: 1) the TribID field in the LocMaster table was made conditionally required -- it is now required only for lotic waters; 2) codes for two new calculation methods were added -- 'video counts', and 'estimation based on video count'; and 3) two codes were requested by ODFW during 2013 that were not actually added until calendar year 2014, after the end of this reporting period. One is a sampling method code for 'fyke trap'. The other is a life stage code for 'adults and juveniles'.

PSMFC All Tier 2 fish abundance data that was compiled and submitted to PSMFC was logged, checked for quality and loaded into the database and made available to the StreamNet web sites.

Category	Agency	Species	MaxYr	NewObs	Post Date
Est. of Spawning Populations	ODFW	Chinook salmon	2011	11	2013-10-04
Est. of Spawning Populations	ODFW	Coho salmon	2011	40	2013-10-04
Est. of Spawning Populations	ODFW	Redband trout	2012	3	2013-10-04
Est. of Spawning Populations	ODFW	Steelhead	2012	8	2013-10-04
Est. of Spawning Populations	ODFW	White sturgeon	2011	1	2013-10-04
Redd Counts	MFWP	Bull trout	2012	131	2013-10-04
Redd Counts	ODFW	Bull trout	2011	61	2013-10-04
Redd Counts	ODFW	Chinook salmon	2012	241	2013-10-04
Redd Counts	ODFW	Steelhead	2012	39	2013-10-04
Redd Counts	IDFG	Chinook salmon	2013	160	2013-12-09
Spawner Counts	ODFW	Chinook salmon	2012	427	2013-10-04
Spawner Counts	ODFW	Coho salmon	2011	16	2013-10-04
Spawner Counts	ODFW	Steelhead	2011	18	2013-10-04
Hatchery - Returns	IDFG	Chinook salmon	2013	34	2013-12-09
Hatchery - Returns	IDFG	Steelhead	2013	20	2013-12-09
Hatchery – Returns	USFWS	Chinook salmon	2012	13	2013-12-09
Hatchery – Returns	USFWS	Coho salmon	2012	4	2013-12-09
Hatchery – Returns	USFWS	Steelhead	2012	3	2013-12-09
Hatchery – Disposition	USFWS	Chinook salmon	2012	89	2013-12-09
Hatchery – Disposition	USFWS	Coho salmon	2012	19	2013-12-09
Hatchery – Disposition	USFWS	Steelhead	2012	8	2013-12-09
Age	USFWS	Chinook salmon		74	2013-12-06
Age	USFWS	Coho salmon		3	2013-12-06
Age	USFWS	Steelhead		4	2013-12-06
Age	ODFW	Steelhead		76	2013-10-04
Age	ODFW	Redband		18	2013-10-04
Barriers	MFWP			565	2013-10-04
Fish at Barriers	MFWP			573	2013-10-04
Distribution	MFWP			306	2013-10-04
Trend updates	ODFW	various	2011	73	2013-10-22

USFWS There was no Tier 2 data for FWS to supply.

WDFW We engaged in discussions about the best way to cope with the difference between StreamNet's species and runs versus the CRITFC crosswalk species (and runs). We suggested, at least at this time, it's better to add the PopulationIDs to the Trend table rather than redefine the StreamNet species runs.

Tier 3 Juvenile abundance - determine availability and compile data

160. Create/Manage/Maintain database

Deliverable: Juvenile fish data types are functional within the StreamNet DES, a database is developed for the data, and the data are quality checked and managed in DES format as they are received.

PSMFC All juvenile abundance data that was compiled and submitted to PSMFC was logged, checked for quality and loaded into the database and made available to the StreamNet web sites.

Category	Agency	Species	MaxYr	NewObs	Post Date
Dam/Weir Counts (Ad. or Juv.)	ODFW	Coho salmon	2010	24	2013-10-04
Dam/Weir Counts (Ad. or Juv.)	ODFW	Redband trout	2012	4	2013-10-04
Dam/Weir Counts (Ad. or Juv.)	ODFW	Steelhead	2012	24	2013-10-04
Est. of juvenile populations	ODFW	Chinook salmon	2009	56	2013-10-04
Est. of juvenile populations	ODFW	Steelhead	2012	72	2013-10-04
Juvenile Counts	ODFW	Steelhead	2012	23	2013-10-04

Tier 3 Juvenile abundance - DES and database

160. Create/Manage/Maintain database

Deliverable: The StreamNet DES functions to include juvenile fish abundance data, and data are quality checked and managed in DES format in the StreamNet database.

CTCR No work was conducted during the year as staff focused on higher priority data and other BPA priorities.

IDFG Participation in development of DES for juvenile abundance was not completed due to it being a lower priority than the BPA Data Repository Survey, CA HiLI development and delivery, and submittal of higher priority data like redd counts and hatchery returns.

MFWP No work was conducted during the year as staff focused on higher priority data and other BPA priorities.

ODFW Staff attended and discussed collaboration during a Regional StreamNet hosted meeting regarding the JMX data exchange and the CDFG juvenile migration database. ODFW participated in other meetings as needed during the year. ODFW submitted data for functionality testing of juvenile fish abundance data types for the StreamNet DES and no issues were reported. It was determined through the SN Technical Committee that no database changes were needed.

PSMFC No changes were made to the StreamNet Data Exchange Standard during 2013. This was at least partially due to StreamNet project priorities being on Coordinated Assessments data types. Data Exchange Standards for those tables were developed instead.

WDFW Draft DES completed for CAX Juvenile abundance.

Tier 4 Resident fish abundance data - DES and database

160. Create/Manage/Maintain database

Deliverable: Resident fish data types are functional within the StreamNet DES, a database is developed for the data, and the data are quality checked and managed in DES format as they are received.

CTCR No work was conducted during the year as staff focused on higher priority data and other BPA priorities.

IDFG Participation in development of resident fish DES was not completed due to it being a lower priority than the BPA Data Repository Survey, CA HiLI development and delivery, and submittal of higher priority data like redd counts and hatchery returns.

MFWP MFWP StreamNet staff have had discussions with PSMFC regarding incorporating existing resident fish data into existing DES'. This may require additional fields or look up values to accommodate existing data. Modifications being proposed in 2014 should accommodate most of Montana's resident fish data.

ODFW No work was done in 2013 due to other BPA priorities but ODFW staff are ready to participate if requested.

PSMFC No changes were made to the StreamNet Data Exchange Standard during 2013. This was at least partially due to StreamNet project priorities being on Coordinated Assessments data types. Data Exchange Standards for those tables were developed instead. However in this case the regional fish biologist at PSMFC and the WDFW project manager discussed types of juvenile abundance data that would be appropriate for StreamNet and determined that any type could be captured in the already-existing StreamNet tables. The one exception to this is population-level data, but those data are to be developed under a to-be-developed data standard under the Coordinated Assessments umbrella.

I Determine availability of data

Tier 3 Juvenile abundance - determine availability and compile data 159. Transfer/Consolidate/Regionally Standardize Data

Deliverable: Report on availability of juvenile fish abundance data as detailed in the DES for each participating agency is published.

CTCR No work was conducted during the year as staff focused on higher priority data and other BPA priorities.

IDFG Determining the availability of juvenile abundance data was not completed due to it being a lower priority than the BPA Data Repository Survey, CA HiLI development and delivery, and submittal of higher priority data like redd counts and hatchery returns.

MFWP No work was conducted during the year as staff focused on higher priority data and other BPA priorities.

ODFW Drafted and updated a juvenile abundance data plan to locate, determine availability, and access methods of acquisition for juvenile abundance datasets within the Columbia Basin of Oregon. Contacted state biologists and data analysts identified in the BPA Data Inventory and Coordinated Assessments Project to determine the availability of juvenile data within the Interior Columbia domain. The inventory performed showed that data exists for smolt to adult returns, abundance counts, outmigration estimates, and population estimates.

PSMFC No changes were made to the StreamNet Data Exchange Standard during 2013. This was at least partially due to StreamNet project priorities being on Coordinated Assessments data types. Data Exchange Standards for those tables were developed instead. Because effort was put toward Coordinated Assessments, no DES was created for juvenile fish data and thus there was no need to assess availability of data sets of this type.

WDFW Coordination efforts are taking place by the Lead Data Manager on the Columbia River to provide training and instructions for biologists to enter their juvenile data into a JMX access template with upload to the corporate Juveniles Database (JMX). Additional coordinating efforts are taking place in the Lower Columbia River and moving up river to capture all juvenile data in one template that can be loaded into the JMX Corporate. Production estimates can then be added to the JMX Corporate that can then be used in the processes of producing some HLI's.The 2012 and 2013 Juvenile data for the Lower Columbia River (Wind River Down) tributaries has been entered and proofed in the JMX Access database. Columbia River Data Managers are working with Olympia Data Managers/Programmers to deliver this data to the corporate Juveniles database. This process is almost complete and testing/delivery will happen before the end of FY 13. After project information has been added to the Juveniles database, the raw data will be uploaded, then the abundance estimates will be entered by the biologists and research scientists. Updates and modifications to the 2012 JMX Access database will be mostly complete by the end of FY 13 and will be ready to use for the next smolt trapping season. A smother and more timely delivery of juvenile data will occur in FY 14 due to processes and protocols put in place this current FY.

Tier 4 Resident fish abundance - determine availability 159. Transfer/Consolidate/Regionally Standardize Data

Deliverable: Availability of the various types of resident fish data as described in the DES is reported in a final report

CTCR No work was conducted during the year as staff focused on higher priority data and other BPA priorities.

IDFG	A survey of the availability of resident fish abundance data was not completed due to it being a lower priority than the BPA Data Repository Survey, CA HiLI development and delivery, and submittal of higher priority data like redd counts and hatchery returns.
MFWP	MFWP has an extensive resident fish abundance data set. All available data were uploaded to the StreamNet Data Store as an independent data set.
ODFW	No work was done during CY-2013 as staff focused on CA indicator and metric data. Work will be performed and results reported in the CY-2014 annual report.
PSMFC	No changes were made to the StreamNet Data Exchange Standard during 2013. This was at least partially due to StreamNet project priorities being on Coordinated Assessments data types. Data Exchange Standards for those tables were developed instead. Because effort was put toward Coordinated Assessments, no DES was created specifically for resident fishes data and thus there was no need to assess availability of data sets of this type.
WDFW	Emphasis in FY13 was placed on BPA data inventory and CA work. No resident fish abundance data was pursued.

J Coordination

Coordination at the regional scale 189. Regional Coordination

Deliverable: StreamNet participants coordinate with regional entities to manage and improve data sharing at the Columbia Basin scale.

IDFG	IDFG coordinated data priorities with the Idaho representative to the Fish and Wildlife Program.
IDFG	IDFG StreamNet staff helped with coordination of IFWIS data collection, compilation, management, and access among federal, state, and tribal collaborators outside of the BPA Fish and Wildlife Program.
IDFG	IDFG StreamNet staff helped with coordination of IFWIS data collection, compilation, management, and access among federal, state, and tribal data source agencies collaboratorating within the BPA Fish and Wildlife Program.
MFWP	MFWP participated in conference calls and meetings with PNAMP and other states related to Coordinated Assessments.
MFWP	Coordination within MFWP occurred, tribes were contacted with respect to resident fish information collected. Staff coordinated with Forest Service employees to ensure relevant survey data was transferred to MFWP in an efficient manner.
ODFW	Coordination with ODFW, other agencies, tribes, regional groups, non-profits, etc. for the purpose of enhancing the collection and management of data related to the StreamNet project mission and efficient flow of data to the StreamNet database beyond the CA process was limited in CY-2013. Staff participated in NPCC F&W Committee meetings via conference call early in the year. Upon request, information on the Coordinated Assessment Data Sharing Strategy Update document was provided to the ODFW Columbia River Coordination Program Manager. Staff provided guidance to Regional StreamNet regarding 6 ODFW data repositories in Monitoring Methods. Two records were duplicate information and were removed. The other four records were updated to correct the URL location and Comments fields. Updates were provided to Jacque Schei (USGS, PNAMP) via Regional StreamNet staff.

ODFW Bi-monthly meetings of the GIS Coordination Group were attended by Oregon StreamNet staff where the emphasis was on the development and communications revolving around the metadata standard. Through the ODFW GIS Coordination Group Metadata Workgroup, Oregon StreamNet staff finalized a simple metadata standard for the agency. Templates were developed in Excel spreadsheet, Access database and GIS formats so that metadata can be stored along with the source data. "Buy-in" by top level agency administrators was obtained by developing and delivering a metadata standard presentation to the Resource Management and Executive Leadership Teams. Approval was obtained to move forward with the effort and a memo to come from the Director's office was drafted to spell out the near term objectives for agency metadata development. This memo will be distributed in CY-2014. Efforts were also made to coordinate with ODFW's Information Systems Division to ensure that there were no incompatibilities between their application / database documentation methods and the new agency simple metadata standard.

Oregon StreamNet staff led efforts to renew the agency's enterprise GIS license agreement (ELA). Training credits available through the ELA were obtained and distributed to agency staff for building capacity for working with spatial data.

ODFW NRIMP staff participated in several workshops and meetings throughout the year. Two were centered on conservation and recovery data management issues, specifically Viable Salmon Population (VSP) data. A Data Sharing and Standards Workshop convened by the NE-Central Oregon Research and Monitoring (NECORM) focused on promoting data, terminology, and metadata standards, discussing a formal data management system, and data sharing agreements. The other was a meeting held by the ODFW Columbia River Coordination Program Manager and included topics relating to ODFW's data management strategy, funding needs, reporting criteria to funding agencies (BPA, StreamNet, and NOAA), and the importance of consistency and standards from data collection to reporting. Workgroups were formed from each to address some of the above issues.

Oregon StreamNet staff led Data Sharing and Standards Workgroup meetings during the year with other ODFW participants. Objectives focused on standardizing ODFW salmonid data products (indicators and metrics) in the Columbia Basin that are shared regionally as part of Recovery Planning. This effort should increase efficiency and quality assurance of reported data products to regulatory and funding agencies. Outcomes of the meetings were: 1) the Northeast-Central Oregon Research and Monitoring program (NECORM) has started the process of standardizing fields among their datasets that are used to calculate data products, 2) a standard file naming convention has been initiated and used for the Mid-Columbia and Snake River Chinook and steelhead populations; and work is continuing to develop file naming standards for other areas in ODFW, 3) abbreviation lists have been started to standardize Recovery Planning elements within a filename (geographic regions, dataset type, life history, species, etc.).

Oregon StreamNet staff coordinated with internal staff, the Oregon Department of Transportation, Division of State Lands, Water Resources and Environmental Quality as well as the BLM and USFS regarding migration of aquatic resource data to the National Hydrography dataset and improvement of hydrography data management workflows. Internal meetings were held to improve metadata awareness and creation, strategically address Restoration, Management and Evaluation (RME) information management and to discuss the creation of a corporate species observation database. StreamNet project staff attended the semi-annual Fisheries Biologist meeting where information on population status indicators was discussed and relationships between headquarters and the field were strengthened. Efforts were also made to coordinate with the BLM and USFS on aligning our fish distribution data schemas to facilitate more streamlined integration efforts in the future.

ODFW No work was done during CY-2013 as staff focused primarily on Coordinated Assessment coordination.

PSMFC Assistance was provided on a request basis. Non-Columbia basin data sets were added to the StreamNet data store if part of a larger set of data and added at minimal time and expense.

PSMFC Protocols and methods used in the creation of data generally are documented through formal reports, at varying levels of detail, and for that reason StreamNet has always included the source documents for all data in the database in the StreamNet Library, with direct links to the documents from the actual data. With the regional recognition that protocols and methods described in reports are not always sufficient for fully understanding the origin and uses of the data, a tool to support full description of methods and protocols was developed through PNAMP with support from BPA. Use of this tool, www.monitoringmethods.org to describe sampling methodology is increasing, and StreamNet built a link to the website for the CA project to specify the protocols used to calculate the indicators and metrics.

PSMFC StreamNet coordinated closely with PNAMP in providing technical guidance to the Coordinated Assessments, including completion of the initial pilot effort and development of the Data Exchange Standard for the project.

PSMFC We work closely with states, tribes, agencies, and with organizations such as the NPCC, Columbia River Intertribal Fish Commission (CRITFC), and the Pacific Northwest Aquatic Monitoring Partnership (PNAMP) to ensure that the infrastructure of data management can communicate, share, and interpret data effectively across boundaries.

PSMFC During 2013 project data collection and coordination focused on leadership of the Coordinated Assessments (CA) project with PNAMP. CA is an effort to locate and obtain data on four high level viable salmonid population (VSP) indicators, and to develop Data Exchange Standards (DES) for these indicators.

PSMFC StreamNet supports a regional approach to data management, coordination, and standardization in two key ways. We work cooperatively with the agencies that create the data (ODFW,WDFW,IDFG,MFWP,USFWS,CCT) to embed StreamNet supported technical staff inside these agencies to locate, obtain, standardize, and georeference the data to the regional stream network (hydrography). This data is then submitted to a central database at Pacific States Marine Fisheries Commission (PSMFC). StreamNet provides access to this data by maintaining a coordinated, standardized, web-based distributed information network. At StreamNet data collected by partners are stored, quality checked, and made publicly available through the StreamNet website, www.streamnet.org (Figure 1).

PSMFC No work was done during CY-2013 to collaborate in discussions of non-structured tributary and estuary data as staff focused primarily on Coordinated Assessment coordination.

PSMFC StreamNet also serves as a regional coordination body to support data management and facilitate cooperation across organizational boundaries. StreamNet staff are involved in standardization and coordination efforts on a wide variety of data management issues. We work closely with states, tribes, agencies, and with organizations such as the NPCC, Columbia River Intertribal Fish Commission (CRITFC), and the Pacific Northwest Aquatic Monitoring Partnership (PNAMP) to ensure that the infrastructure of data management can communicate, share, and interpret data effectively across boundaries. The StreamNet project supports coordination through establishing and implementing basin-wide data reporting standards for a specific suite of fish related measures, including abundance, distribution, and productivity, with a long term goal of extending coverage to additional metrics of regional importance.

USFWS Routine data management was supported throughout the entire reporting period.

WDFW WDFW continued to offer our resources this year to upper Columbia tribal data providers to offer our services to funnel data to StreamNet as a repository.

WDFW WDFW StreamNet worked with non-BPA funded entities like PUD's to assist in infrastructure development with the intent to bundle this data into the indicator DES's and / or funnel to SN data store.

WDFW The Data Manager met with other data Managers from CRITFC to show them data collection technologies that we have incorporated into WDFW's Columbia River Sport and Commercial data. The Data Manager went over processes, QA/QC, improvements, data flow, as well as shared all documents, tables, and databases with them. The purpose of this meeting was to help them incorporate these new technologies in the collection of Tribal sport, commercial, and subsistence data for areas above Bonneville Dam.

The Lower Columbia Data Manager also worked with WDFW staff in preparing samplers for commercial sampling - having handhelds charged and ready to use in the field, updated forms for data collecting and any troubleshooting problems that arise in the field or when downloading the data. Technical expertise was given to the Alternative Gear Mortality study - making changes to forms for data collecting, training samplers on how to use the handhelds properly and downloading data, troubleshooting any handheld problems that arise in the field. A database was created for downloading, created reports for data proofing and update the master database with those changes. This knowledge was also shared with ODFW so they could get started with this same project by providing technical assistance, sharing forms, procedures, protocols, database and knowledge on how to set it up and the best way to proceed.

Coordination of PSMFC databases

189. Regional Coordination

Deliverable: A forum to integrate data sharing across PSMFC database projects is developed and implemented.

PSMFC Initial discussions about data integration among PSMFC regional scale database projects centered around coding PIT Tag locations and RMIS hatcheries for presentation on StreamNet hydrography.

StreamNet staff working on the hand-held field data device trials consulted with the RecFIN data project that is testing tablet computers in California sampling fishermen catch at boat ramps.

StreamNet contributed to a shared virtual SQL Server 2012 instance installation at PSMFC along with RecFIN and AKFIN projects.

Lower Tier data - maintain database

160. Create/Manage/Maintain database

Deliverable: Lower tier data are maintained in the StreamNet database.

PSMFC StreamNet requested that BPA obtain the data it wishes to be archived from the Northwest Habitat Institute and provide it to us for archival. The NHI website currently makes these data publicly available at http://www.nwhi.org/index/ibis

PSMFC The following lower tier data was processed in 2013:

Category	Agency	Species	MaxYr	NewObs	Post Date
Harvest - Freshwater/Estuary	ODFW	Green sturgeon	2012	4	2013-10-04
Harvest - Freshwater/Estuary	ODFW	White sturgeon	2012	4	2013-10-04
Dams & Locations	WDFW			1485	2013-02-25
Hatcheries	MFWP			5	2013-10-04
Hatchery updates	ODFW			54	2013-10-22

Tier 4 Resident fish abundance data - coordination

189. Regional Coordination

Deliverable: Coordination with the Upper Columbia resident fish database provides adequate information to assure compatibility of resident fish data in the StreamNet DES.

PSMFC No work was done during CY-2013 as staff focused primarily on Coordinated Assessment coordination.

K Improve data systems

Tier 3 Juvenile abundance - Improve rotary screw trap data system

160. Create/Manage/Maintain database

Deliverable: Agency juvenile trap database systems are compared and improved features are shared among systems.

PSMFC The smolt trap data collection, management, and analysis system funded partially by USFWS in California was very nearly completed in 2013, with only minor effort left for 2014.In spring 2013 StreamNet staff from PSMFC and WDFW met with staff from the Northwest Indian Fisheries Commission and from Windsor Solutions, Inc. to discuss the possible interaction between the PSMFC-created system for data entry and analysis with the WDFW/NWIFC "JMX" system for sharing these data. It was determined that the two systems could actually be very well integrated and complement each other, with one used for data creation and the other for data distribution.

L Disseminate data

Data dissemination - custom requests

161. Disseminate Raw & Summary Data and Results

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

IDFG IDFG StreamNet staff responded to and tracked at least 108 data requests in 2013. Approximately seventy percent of the requests were from state agencies, and fifty percent of the requests were split nearly evenly between redd counts (24%) and fish distribution (22%).

MFWP MFWP received 99 requests during the reporting period. The majority of the requests were for maps or data and were submitted by state government employees. All requests were responded to and fully satisfied.

ODFW Oregon StreamNet responded to 194 requests this year. This is 47% of the requests responded to in CY-2012. This significant decrease in requests is due to level funding which amounts to a reduction resulting in the loss of our GIS Support Technician position, along with a shift in BPA priorities. Hardware/Software requests accounted for more 48% of the requests we responded to; GIS Data/Map requests represented another 34%. It is anticipated that these numbers will continue to drop in CY-2014.

PSMFC Information requests coming directly to StreamNet at PSMFC have been falling off in recent years. In 2013 there were only 20 requests. A summary is shown here:REQUESTER TYPE (number of requests)College / university (6)General public / other (2)Government, county / local (1)Government, federal (6)Government, state (1)Government, tribal / tribal organization (1)Nonprofit organization (1)Regional entity (NPCC, CBFWA, PNAMP, PSMFC, PSC, etc.) (2)REQUEST TYPE (number of requests)Citing StreamNet / permission (1)Data Request (3)General fish information (1)GIS data / map (4)Help finding information (5)Help with data structure (1)Library / Documents (1)Report error or problem (3)Other (1)OUTCOMERequest fully satisfied (15)Request partially satisfied (may include referral to other info source) (4)Could only refer user to other info source(s) (1)

USFWS No StreamNet specific requests were logged this reporting period.

WDFW A total of 25 significant data requests were made and fully satisfied in FY13. These requests came from State Government, Tribes, nonprofit organizations, and College Universities.

Tier 2 data - dissemination

161. Disseminate Raw & Summary Data and Results

Deliverable: The Tier 2 data that are submitted by the source agencies are available for review and download through the StreamNet online query systems and as web services.

PSMFC Processed and made available online all data that was submitted to StreamNet in 2013. Also provided custom reports and data assemblages upon request.

Tier 3 Juvenile abundance - dissemination

161. Disseminate Raw & Summary Data and Results

Deliverable: Juvenile abundance data exchanged by the project partners are made available through the StreamNet online query systems and as web services.

PSMFC All juvenile abundance data in StreamNet is available via web site download.

Tier 4 Resident fish abundance - dissemination 161. Disseminate Raw & Summary Data and Results

Deliverable: Resident fish abundance data exchanged to the StreamNet database by the project partners on an exploratory basis are made available through the StreamNet online query systems.

PSMFC All resident fish abundance data in StreamNet is available via web site download.

Work outside the Statement of Work 998. Work Accomplished Outside the SOW

Deliverable:

IDFG IDFG StreamNet staff continued to share technical expertise and knowledge of data sets with individuals and organizations on a short-term basis upon request. Non-StreamNet staff on other funding continued to develop a whole-stream routing system using LLID on the 1:24,000 scale National Hydrography Dataset.

MFWP MFWP is developing a centralized hatchery database system to replace a decentralized system written in old technology. The development of this systems is outside of StreamNet funding, however will benefit the project overall. Additionally genetic data continues to be updated outside of the StreamNet contract as is the Yellowstone cutthroat trout assessment database.

ODFW A grant was written and funds were obtained to improve and maintain the Oregon Fish Passage Barrier Database and address issues of currency as restoration projects are completed. GIS staff filled a legislative request for maps of state / federally listed threatened and endangered salmon and steelhead species to inform decisions affecting suction dredge mining in the state. Staff also participated in a fish passage barrier mitigation banking pilot project where The Nature Conservancy, Oregon Department of Transportation and ODFW worked to better understand measurable benefits of shifting fish passage barrier restoration from one location to another.

Significant work was accomplished in migrating aquatic resource data to the National Hydrography Dataset outside of the Columbia basin. There were nearly 800 edits and approximately 500 extensions and additions made to the NHD Flowline data within Oregon, substantially improving the ability of the StreamNet project to map and analyze aquatic resource data on the NHD.

Oregon StreamNet staff drafted maps to assist in the angling regulation update process with the Oregon Fish and Wildlife Commission. Additionally, redband and bull trout habitat distribution maps were drafted for the areas in proximity to Mason and Warm Springs dams in eastern Oregon related to two separate fish passage waiver requests that went before the Commission. Maps were also drafted for the 2014 Sport Fishing Regulation booklet and for the new Columbia River Basin Salmon and Steelhead license endorsement. Staff developed and processed spatial data in support of the Oregon Sport Fishing Map Application, improving understanding of the capabilities and limitations of mobile applications.

Staff met with the BPA-funded Willamette Wildlife Mitigation Program staff to provide data, database and web application consultation for a data management project they are considering.

Staff worked with the Oregon Department of Administrative Services, Geospatial Enterprise Office to obtain grant funding for better integration of fish passage barrier data management workflows with the Oregon Watershed Enhancement Board's Watershed Restoration Inventory.

PSMFC Provided assistance to individuals and organizations as requested on issues of data management, fish populations, and similar requests.

WDFW WDFW continues internal merger of juvenile migrant data into our JMX corporate, we refined our Salmon conservation Reporting Engine (SCoRE and migrated our SalmonScape web mapping system to ArcGIS server platform. We began work on a statewide Age Database. we've migrated our hatchery systems to corporate SQL Server platforms and continued to refine our FishBooks database.

M Enhance data efficiency - system development

Enhance data efficiency - automated data feeds

160. Create/Manage/Maintain database

Deliverable: Web services or other automated means are established, and automated flow of data to StreamNet is tested.

IDFG	A web service was developed and tested successfully in coordination with PSMFC to automate the flow of CA HiLI data to StreamNet and then NOOAF databases.
MFWP	No web services were created in the reporting period. However, that were developed can likely be modified at a later date to allow for more direct data flow to StreamNet.
PSMFC	Automated data submission REST web services have been created and are available for Coordinated Assessments data types. Idaho is currently testing data submission via these services.
WDFW	No specific work done this year sending data directly to SN outside of the CAX planning work. We did work on internal service development will use this technology to transmit data to StreamNet

Enhance data efficiency - system development

160. Create/Manage/Maintain database

Deliverable: Agency database systems and procedures are enhanced over time to improve data flow efficiency.

IDFG	Data sources were consolidated and standardized for NOSA and AR/S data. Controls were added to enhance data quality, and data entry eliminated to decrease error and increase efficiency.
MFWP	During the data exchange period, a number of python scripts were developed to automate the data flow process, provide a better mechanism for spatial and tabular data validation and prepare for the use web services.
ODFW	Oregon StreamNet continued efforts to improve overall data flow from the field by continuing the development of a data management and delivery system that also provides benefits to field projects. During the year, 53 new dataset records were reviewed, approved and made public through the ODFW Data Clearinghouse (DC) and assistance was provided to other ODFW staff to upload reports to the StreamNet Data Store. ODFW revised an FGDC compliant metadata form for use with complex datasets and began implementing it for Recovery Plan datasets. Personnel worked with Recovery Plan staff throughout the year to get CA data onto the ODFW Salmon Recovery Tracker and to standardize field names from originating datasets with files that are downloaded from the Recovery Tracker. ODFW developed a working document to provide direction for file naming conventions, which is being piloted by some Recovery Planning staff. NRIMP staff updated the Data Management Manual for the CA/ISTM/NOAA Projects and improved the system to track acquired datasets and associated files.
PSMFC	Provided data system development assistance as requested. Mainly worked with Idaho on Coordinated Assessments data submission systems.

N Coordinate field data capture device trials

Data capture devices - conduct field trials — 157. Collect/Generate/Validate Field and Lab Data

Deliverable: Field trials of handheld electronic data capture devices are conducted. Results from the initial trials are reported and used to guide additional trials in the future.

PSMFC This project was initiated in 2013. An initial list of potential participants was obtained and these people were contacted via email in September, with follow-up phone calls, to solicit participation in the test. Roughly 15 people agreed to participate if possible. Tablet computers using the Windows, Android, and Apple iOS operating systems were obtained, as were electronic pens. Initial general plans for the assessment were made, and a set of 3 questionnaires was developed that will be used to characterize people's reponses to using these units. However, other priorities in the fall prevented further progress on this task until 2014.

Data capture devices - coordinate field trials — 189. Regional Coordination

Deliverable: A collaborative study plan is produced, and implemented by project cooperators. A work element for conducting the study is added to the statement of work, if required by BPA.

CTCR CTCR has volunteered to participate in future field trials of data capture devices.

PSMFC This project was initiated in 2013. An initial list of potential participants was obtained and these people were contacted via email in September, with follow-up phone calls, to solicit participation in the test. Roughly 15 people agreed to participate if possible. Tablet computers using the Windows, Android, and Apple iOS operating systems were obtained, as were electronic pens. Initial general plans for the assessment were made, and a set of 3 questionnaires was developed that will be used to characterize people's reponses to using these units. However, other priorities in the fall prevented further progress on this task until 2014.

PSMFC Sampling protocols for this evaluation were created in the form of questionnaires for field testers to complete at various stages of their tests. Data entry forms will be created for each tester, as will programming for returning data to them. Coordinating timing of field tests will be performed in 2014.

WDFW A considerable amount of time was spent testing data capture devices, creating electronic forms, creating protocols, and continued research and development. This work was performed in conjunction with PSMFC staff.

Data capture devices - develop data systems for trial — 160. Create/Manage/Maintain database

Deliverable: A real-world test of the selected data capture devices and related cloud database services is conducted and the results are reported. Recommendations for future use are included in the report.

PSMFC The StreamNet regional programmer developed approaches for data systems for serving this test. This involved much research of the Fulcrum App (www.fulcrumapp.com) API, and strategies for creating data systems at StreamNet for data management and transfer.No devices were deployed in 2013.

O Metadata exchange through Monitoring Explorer pilot project

Metadata exchange through Monitoring Explorer pilot project 161. Disseminate Raw & Summary Data and Results

Deliverable: Metadata for the pilot explorer are provided to Sitka via web services in conformity with the project metadata exchange standards.

PSMFC Attended Monitoring Explorer related meetings with Sitka and PNAMP. The pilot effort is still in exploratory stages. StreamNet awaits a follow-up meeting or request via PNAMP regarding any next steps. We understand that Sitka is using existing metadata from CHAMP and other internal projects to drive phase one of the pilot and work out the details.

P Data sharing agreement - finalize and implement

Data sharing agreement - finalize and implement 161. Disseminate Raw & Summary Data and Results

Deliverable: The draft Data Sharing Agreement template is released for regional review. A version of that template is adopted by StreamNet and implemented for data obtained through the Data Store.

PSMFC This product was under development at the close of CY 2013 and should be completed in the first half of CY 2014.

Q Infrastructure and base operations

Infrastructure and base operations 160. Create/Manage/Maintain database

Deliverable: Project infrastructure and databases are maintained and updated as needed to acquire, manage and disseminate data.

CTCR CTCR has developed a plan to update its databases and is sharing data through StreamNet and on CTCR website

IDFG IDFG StreamNet staff provided reference documents and/or on-line data source addresses for all data submissions.

IDFG IDFG StreamNet staff administered IFWIS SQL databases, and maintained back ups of all IFWIS databases.

MFWP Reference documents were added to internal library systems and information exchanged with StreamNet according to the DES.

MFWP Existing computer infrastructure and operations were maintained throughout the year. ArcGIS 10.1 server environment was developed and is fully functional. A mapping application for internal users was upgraded from ArcIMS to ArcGIS server based technology. Steps were taken to move fisheries data from a failing SQL server at Montana's Natural Resource Information System (NRIS) over to Oracle servers managed by MFWP. This was unanticipated work, but deemed a priority due to the perceived instability of the server.

ODFW Routine system management and maintenance was performed throughout the year. Maintenance was performed on SQL databases and their respective log files. Research was conducted for new computer hardware purchases. Agency ArcGIS Desktop users were upgraded to version 10.1. The license server was upgraded to support version 10.2. The costs and benefits of upgrading ArcGIS Server and SQL Server software were evaluated. Staff renewed the SSL certificate on the NRIMP web server.

The data structure and user interface for Oregon's Trend database were enhanced by updating the Trend form and adding a new field for BPA project number. Data stewards conducted routine database maintenance and QAQC, including; correcting Visual Basic code running data entry forms, developing new quality assurance queries, and geo-referencing 326 trends. Existing contacts in the Data Contacts database were updated and an additional 15 contacts were added during the BPA Data Inventory.

ODFW staff continued to collaborate with PSMFC staff by conducting QAQC of historic data, error checking data for incorrect codes/conventions according to the StreamNet DES, and addressing issues related to the 2013 data submission. We also coordinated with state data analysts in NE Oregon and Willamette/Lower Columbia to resolve other QAQC issues related to Recovery Populations and the BPA Data Inventory.

Staff developed full FGDC compliant metadata for Recovery Planning populations in the Interior Columbia Domain, which included; seven spring Chinook, eight summer steelhead, and one winter steelhead population. During the BPA Data Inventory, short form (simple) metadata was written for the Oregon chub and Trout Creek summer steelhead population.

Approximately 47,000 whole stream route events (LLIDs) that were migrated to the NHD were quality checked against input features and corrections were made. Efforts were made to coordinate with the BLM to improve hydrography data content management and workflows. Grande Ronde basin spring chinook, John Day basin summer steelhead and spring chinook spawning survey locations (303 total) were quality checked for locational accuracy. Updated spatial data for Evolutionary Significant Units / Distinct Population Segments were acquired from NOAA, processed into species-specific datasets and made available to agency staff. Metadata development activities were performed including standard creation and communications to staff regarding implementation of the standard.

ODFW ODFW submitted 41 updated reference records, spanning the years 1938-2012, to the StreamNet Library. Forty references were new documents to the Library with the majority related to the BPA Inventory and Coordinated Assessments (CA) projects. Except for efforts related to abundance trends and the CA project, direct QAQC efforts for references in the database were foregone this year due to other priorities. We continued filing and assigning RefIDs and providing URL's to datasets delivered to the program. Most recently staff updated four existing references and added six new references that will be submitted to the StreamNet Library in FY-2014.

PSMFC The StreamNet website, data query system, classic data query system, and data store were maintained by coding fixes, updates, and enhancements as requested and/or scheduled with respect to the 2013 work plan.

PSMFC GIS hardware and software was maintained and upgraded (ArcGIS platform v10.2). In addition to routine system maintenance, work was done to organize, archive and move StreamNet data and documentation to a new virtual server.

PSMFC Existing web mapping applications were maintained and initial steps were made to upgrade to a newer system. Most effort on this front, however, went into improving the Integrated Query System.

PSMFC Hydrography edits submitted by ODFW were processed in the fall of 2013. Regional GIS staff continued to engage in regional hydrography forums, including the PNW Hydro Framework Partnership.

PSMFC StreamNet's spatial data products were maintained and updated for user's to access as both live web mapping services and as downloadable packaged datasets.

PSMFC StreamNet has always included the source documents for all data in the database in the StreamNet Library, with direct links to the documents from the actual data. Links and referrals to the CRITFC StreamNet library are provided on the website.

USFWS IT staff provided OS and network support, while CRiS programs continued to be both maintained and updated.

USFWS	No new documents were added to the library this year.
WDFW	All computer software and equipment is routinely updated by IT to ensure the latest updates and security patches are installed. Upgrades this year were made to ArcGIS 10.1.
WDFW	Emphasis this FY was placed on building infrastructure to store the raw data that is needed to populate the Coordinated Assessments (CA) database. The ultimate goal is to be able to report on abundance or indicators using the storage of the raw data to derive this. No effort was given to capture or collect paper reports to update trends due to this new effort.

R Manage project activities

Manage project activities 119. Manage and Administer Projects

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

CTCR	The IDFG StreamNet manager supervised employees and provided guidance throughout the calendar year.
CTCR	Project and budget are being monitored.
IDFG	The IDFG StreamNet manager provided oversight and guidance throughout the calendar year, and participated in SN Steering Committee meetings.
IDFG	IDFG StreamNet staff provided input and participated in the development of the Fiscal Year 2015 budget.
IDFG	The project and budget were monitored throughout the calendar year.
IDFG	The IDFG StreamNet manager supervised employees and provided guidance throughout the calendar year.
MFWP	Project and budget were monitored throughout the year.
MFWP	StreamNet staff were supervised and guidance was provided where necessary.
MFWP	Project was managed and all Steering Committee meetings were attended in person or via conference call.
ODFW	Project staff were supervised, and guidance and staff development were provided . Staff also took required training, and applicable discretionary training as time and resources allowed. Oregon StreamNet staff from Salem as well as staff from Corvallis relocated to the new ODFW headquarters in south Salem during the year. An ODFW Data Steward was hired early in the year. The Software Developer/Database manager position was also filled but was vacated before the calendar year ended. Four temporary staff were recruited for and hired to perform priority CA tasks associated with the modified FY-2013 Statement of Work.
ODFW	ODFW conducted budget oversight and expenditure tracking, and managed budget resources in accordance with contract deliverables. In the face of reduced funding, staff identified services that support BPA/StreamNet that would be accomplished or dropped depending on funding level scenarios.
ODFW	Oregon StreamNet participated fully in the Steering and Technical Committee meetings either in person or via conference call. The Oregon StreamNet Project Manager provided general project oversight throughout the year.

ODFW	Oregon StreamNet staff participated fully and provided input into the development of the FY-2014 Statement of Work and budget.
PSMFC	Project was managed through effective communication. Regular Steering Committee meetings were conducted as planned.
PSMFC	The FY 2014 budget and SOW was prepared and approved in a timely manner.
PSMFC	Budgets were monitored and issues resolved so that spending was managed appropriately during the CY.
PSMFC	Direct supervision was provided to PSMFC StreamNet staff. Oversight and guidance was provided to subcontractors directly and through the Steering Committee.
USFWS	FWS admin and the project manager cooperated to prepare and implement the utilization of StreamNet funding to accomplish contracted activities and prepare for the next fiscal year.
WDFW	Input was provided for CY 2012 during the work period.
WDFW	WDFW continued to manage budget resources in accordance with our contract deliverables to the best of our ability.
WDFW	WDFW continued to manage staff resources in accordance with our contract deliverables to the best of our ability.
WDFW	WDFW continued to attend all StreamNet SC meetings and provide input either in person or via conference call

S Reporting

Executive Summary - Data Development 999. Executive Summary

Deliverable:

CTCR	Input is provided for reports as requested.
IDFG	IDFG StreamNet manager and staff provided input for reports.
MFWP	Input was provided.
PSMFC	Input was solicited and a report was produced for CY 2012 during the work period.
WDFW	Input was provided for CY 2012 during the work period.

Executive Summary - Data Dissemination 999. Executive Summary

Deliverable:

CTCR	Input is provided for reports as requested.
IDFG	IDFG StreamNet manager and staff provided input for reports.
MFWP	Input was provided.

PSMFC	Input was provided for CY 2012 during the work period.
WDFW	Input was provided for CY 2012 during the work period.

Executive Summary - Database 999. Executive Summary

Deliverable:

CTCR	Input is provided for reports as requested.
IDFG	IDFG StreamNet manager and staff provided input for reports.
MFWP	Input was provided.
PSMFC	Input was solicited and a report was produced for CY 2012 during the work period.
WDFW	Input was provided for CY 2012 during the work period.

Executive Summary - Project Administration 999. Executive Summary

Deliverable:

IDFG	IDFG StreamNet manager and staff provided input for reports.
MFWP	Input was provided.
PSMFC	Input was solicited and a report was produced for CY 2012 during the work period.
WDFW	Input was provided for CY 2012 during the work period.

Executive Summary - Regional Coordination 999. Executive Summary

Deliverable:

CTCR	Input is provided for reports as requested.
IDFG	IDFG StreamNet manager and staff provided input for reports.
MFWP	Input was provided.
PSMFC	Input was solicited and a report was produced for CY 2012 during the work period.
WDFW	Input was provided for CY 2012 during the work period.

Produce Annual Report 132. Produce Annual Report

Deliverable: Finalize and submit 2012 Annual Report to BPA for upload into Pisces of work conducted for the calendar year to be submitted to BPA COTR and RMESupport@bpa.gov.

CTCR	Annual report submitted.
IDFG	IDFG StreamNet staff produced and submitted their annual report.
MFWP	MFWP StreamNet staff assisted in the preparation of the 2012 annual report.
ODFW	ODFW StreamNet staff assisted in the preparation of the 2012 annual report.
PSMFC	CY 2012 annual report was completed during this period.
PSMFC	BiOp report for 2012 was completed.
USFWS	FWS contributed their portion of the Annual Report.
WDFW	WDFW StreamNet staff assisted in the preparation of the 2012 annual report.

Produce Other Report 141. Produce Other Report

Deliverable: 2013 FCRPS BiOp Report for BPA for Calendar year January -December 2013

PSMFC	The 2012 BiOp report was completed in CY 2013.
PSMFC	The 2012 BiOp report was completed in CY 2013.
PSMFC	The 2012 BiOp report was completed in CY 2013.

Produce Pisces Status Report 185. Produce Pisces Status Report

Deliverable: Status Report submitted on quarterly schedule.

CTCR	Quarterly status report produced.
IDFG	IDFG StreamNet staff produced and submitted quarterly reports.
MFWP	All quarterly status reports were completed and submitted.
ODFW	All quarterly status reports were completed and submitted.
PSMFC	Completed as required during CY 2013.
USFWS	All quarterly reports were completed.
WDFW	All quarterly status reports were completed and submitted.

T Other

Other accomplishments 986. Catch-all for FY-13 SOW items or anything else

Deliverable: Catch-all for elements from the FY-13 SOW or anything else you'd like to report

IDFG IDFG StreamNet has no further milestones to report.

ODFW What follows represents FY-2013 milestones not captured in the FY-2014 Milestones above:
2013_only_E189: ODFW staff continued coordination with regional and state StreamNet partners on the BPA Data Inventory. Participation was structured around conference calls, forum submissions, and electronic communications. The ODFW Data Steward coordinated with IDFG and WDFW to resolve projects with overlapping boundaries. Partners agreed that ownership of a contract(s) (within a project) will reside with the respective state, rather one agency assuming responsibility for the entire project. Staff coordinated with all StreamNet participants to organize and review original datasets provided by BPA and develop a final inventory product for delivery to PSMFC. At the conclusion of the inventory, staff conducted a post-inventory review and QA for the PSMFC Database Manager as requested.

2013_only_J189: Oregon StreamNet staff coordinated internally with ODFW Conservation and Recovery Program staff to develop appropriate agency input and guidance for the CRITFC Population Crosswalk project. The web application was reviewed and comments were provided to minimize potential misinterpretation of discrepancies between fish distribution and population boundary data. Other comments on the potential for improper application of more extensive geographic units (e.g. ESU's) to smaller geographic units (e.g. 6th field watersheds) were provided. ODFW staff provided input on metadata for ODFW population boundary data.

2013_only_Z161: Staff gave a presentation representing NRIMP and StreamNet to the annual ODFW Fish Division All-Staff meeting promoting standards, flow diagrams, data management & sharing. ODFW StreamNet staff participated in the NE-Central Oregon Research and Monitoring (NECORM) Data Sharing and Standards Workshop with a focus on CA data, terminology, metadata standards, and the need for a data sharing agreement. There was also discussion of an Access database that was created to provide efficient development and reporting of CA indicators and metrics.

PSMFC Milestone revisions are under consideration.

USFWS There is nothing else to report.

WDFW No additional milestones this year.