DRAFT 2018 StreamNet BiOp Report 20190214

RPA 51.1 Synthesize fish pop metrics thru Regional Data Repositories

1. Partner agencies funded through this project are: the Confederated Colville Tribes (CCT), Idaho Department of Fish & Game (IDFG), Montana Fish, Wildlife, and Parks (MFWP), Oregon Department of Fish & Wildlife (ODFW), and Washington Department of Fish & Wildlife (WDFW). StreamNet works cooperatively with the agencies that generate the data through StreamNet supported technical staff inside these agencies. These data are used internally by each agency and also submitted to a central database at Pacific States Marine Fisheries Commission (PSMFC). StreamNet provides access to these data by maintaining a coordinated, standardized, web-based distributed information network. Data collected by partners are stored and made publicly available through the StreamNet website www.streamnet.org (Figure 2) or the StreamNet Data Store, both of which are recognized as Regional Data Repositories.

StreamNet supports data flow and management within the data source agencies through assistance in development of database systems and approaches for improving data management efficiency and data dissemination. StreamNet currently handles data sharing for some agencies and supports development of agency capacities for others. StreamNet employees and subcontractors locate data, standardize data reporting through the cooperative development of protocols, complete QA/QC of data, and then assure the flow of data from state, tribal, or agency repositories to and through StreamNet. StreamNet participates in or leads a variety of teams of data management professionals from states, tribes, and agencies that coordinate regional data sharing. Data flow has been/is being streamlined through the implementation of application programming interfaces (APIs) for various data types.

StreamNet’s current priority is to help lead implementation of the Coordinated Assessments (CA) project, in partnership with the Pacific Northwest Aquatic Monitoring Partnership (PNAMP). CA focuses on salmon and steelhead populations in the Columbia Basin. The primary data types contained in and disseminated through the CA project that relate to abundance and Viable Salmon Population (VSP) parameters are five VSP indicators including population scale estimates of natural spawner abundance, smolt to adult ratio, adult recruits per spawner (spawner to spawner ratio) smolt outmigrants and presmolt abundance. In addition to high level indicator data, related data (aka Trends) is also curated by the StreamNet project, including spawner counts, juvenile counts, redd counts and dam and weir counts. These are raw data that relate to population estimates and estimates of VSP parameters, summarized to annual totals.

The Coordinated Assessments (CA) Project is an effort to develop efficient, consistent, and transparent data-sharing among the co-managers (fish and wildlife agencies and Tribes) and regulatory/funding agencies (BPA and NOAA) of the Columbia River Basin (CRB) for anadromous fish related data. The project has been coordinated by PNAMP and the PSMFC StreamNet project since its inception in 2010 (see: https://www.pnamp.org/project/coordinated-assessments-for-salmon-and-steelhead). A 5-year Plan for the CA project is reviewed and approved annually by the StreamNet Executive Committee. The Executive Committee is made up of fisheries professionals at the policy level from all member organizations, as well as CRITFC, NOAA-Fisheries, USFWS, PSMFC, BPA, PNAMP and the NPCC. CRITFC member tribes have been invited to participate on both the Executive Committee and Steering Committee and sometimes attend. The tribes have made it clear that lack of funding restricts their ability to participate. The 5-year Plan prioritizes data for contribution from partners.

1. CA is focused on the key indicators and metrics that have been identified as priorities for reporting progress on implementation of the Federal Columbia River Power System (FCRPS) Biological Opinion (BiOp). At the end of 2015, BPA identified a need to gather as much data as possible for populations they determined were Tier 1 and Tier 2 priorities and efforts continued to be focused on these 69 populations. Updates of certain standard data “trends”, such as those related to the CA project or feeding the NPCC dashboards (including for resident fish), are also a priority.



In addition, the StreamNet Data Store is a repository for 128 additional related datasets, and is available for secure storage and sharing as needed. Data is freely available for download and use by managers and policy makers for completion of analysis and reporting purposes.

1. The Coordinated Assessments (CA) effort has successfully reviewed and implemented data sharing for most natural origin salmon and steelhead populations in the Columbia River Basin, to the extent that population-scale data are available. The StreamNet Executive Committee (SNEC) is the leadership team for this effort, and recommends that membership be expanded, to include all federal, state, and tribal fish and wildlife managers involved in data collection for species and populations to ensure continued progress in coordinated regional data management. Developing and sharing regional High Level Indicators (HLIs) will provide the Northwest Power and Conservation Council (NPCC), Bonneville Power Administration (BPA), and NOAA Fisheries the ability to efficiently evaluate and report on their respective roles in fish and wildlife mitigation, adaptive management, and recovery.

NOAA’s Columbia Basin Task Force, the NPCC, BPA, and the respective states and tribes are developing a monitoring framework for natural origin salmon and steelhead populations that balances available resources with the need to monitor populations. As appropriate monitoring levels are designated for each population, implementation and data sharing should be coordinated through the CA process. Continued support for efforts to coordinate and implement a consistent, sustainable regional direction, including StreamNet, PNAMP, the tribal ITMD project, the CRITFC StreamNet Library, and the Regional Coordination forum, is invaluable and should be continued.

[StreamNet Website](http://www.streamnet.org/)

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RPA 71.4 Implement std metrics, biz practices, & info collection

1. StreamNet contributed to the coordination and standardization of monitoring data throughout the basin in 2018. We actively supported improving data sharing capabilities in the region through the CA project. This project uses an exchange network approach and dynamic web services to share data.

We continued to work with our partners in IDFG, Confederated Tribes of the Colville Reservation (CCT), Montana Fish, Wildlife, and Parks (MFWP), ODFW, CRITFC, and WDFW to promote data standardization within agencies by assisting them with development of database systems designed to ultimately have the capability to share data directly in a regional format. As part of the effort to improve coordination, in 2014 StreamNet instituted an Executive Committee structure. In 2018 the project continued to implement the intent; using policy-level staff from partner agencies and primary data consuming organizations directly involved in setting priorities for the technical data management staff. The Executive Committee provided direction on program priorities in 2018. The StreamNet Steering Committee remains an essential part of the organizational structure of the program as the implementation team for these priorities.

StreamNet coordinated closely with PNAMP in providing technical guidance to the CA project, including development of the Data Exchange Standard (DES), which describes in detail the data items (fields), formats, and coding conventions for the various tables containing data submitted to the regional database by participating agencies and tribes. In 2018 close coordination with the CRITFC Tribal Data and StreamNet Library projects was also a priority. Staff at PSMFC and subcontracting agencies 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.

Data sharing is associated with concerns over interpretation, analysis, and attribution in many cases. Data Sharing Agreements are now in place, and are presented for agreement as data are uploaded and shared.

1. 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 CA 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 developed an automated data dissemination approach modeled after the EPA Exchange Network approach. The ODFW StreamNet subproject enhanced their CA automated data exchange system to stay in sync with StreamNet CAX changes, increase robustness, and implement new pre-submission validation rules. ODFW’s application that loads CA and traditional trend data from an Access database into a SQL database and then on to StreamNet via the StreamNet API was also updated and enhanced. WDFW is in the process of modifying their Salmonid Stock inventory (SaSI) to carry CA indicator data and deliver it to CA StreamNet aggregate databases using the StreamNet API.

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| **Data Category** | **Available Data** | **Years** | **Observations** |
| Redd counts | 5,287 Trends | 1901 - 2018 | 54,125 |
| Fish counts | 474 Trends | 1953 - 2018 | 1,523 |
| Spawner counts | 5,573 Trends | 1944 - 2018 | 42,033 |
| Spawning population estimates | 3,258 Trends | 1901 - 2016 | 24,003 |
| Dam / weir counts | 581 Trends | 1925 - 2018 | 15,248 |
| Juvenile population estimates | 122 Trends | 1996 - 2016 | 892 |
| Hatchery returns | 1,095 Trends | 1906 - 2018 | 10,643 |
| Freshwater harvest | 2,708 Trends | 1894-2015 | 41,724 |
| Protected areas | 29,524 Records | n/a | n/a |
| Fish distribution\* | 158,684 Features/Records | updated 2019 | n/a |
| Barriers | Discontinued. |  n/a | n/a |
| Facilities - dams\* | 7,882 Dams |  n/a | n/a |
| Facilities - hatcheries\* | 539 Hatcheries |  n/a | n/a |
| Marine Harvest | Discontinued. | n/a |  |
| Spawner/recruit estimates | Discontinued; replaced by CA RperS. | n/a |  |
| Maps (pre-built) | Discontinued. |  |  |
| Photographs | Discontinued. |  |  |

 \* Beginning in 2018, fish distribution, dams, and hatcheries (aka fish facilities) are being managed as spatial datasets (GIS layers) rather than as tables in a tabular database. StreamNet partners manage fish passage barrier data for their areas of focus, which informs the fish distribution spatial data that they contribute for compilation region-wide. However, given shifting priorities and reduced project funding, StreamNet no longer maintains and publishes a standardized region-wide fish passage barriers dataset. The StreamNet website directs users to the barriers data that is available from our partners.

1. The SNEC should be tasked with implementing a monitoring data matrix for fish species under the F&W Program. The Council should clearly articulate realistic, sustainable and affordable long-term fish populations reporting goals under the F&W Program that engage all responsible regional parties, including Federal and non-Federal utilities. Regional F&W managers should prioritize monitoring to ensure that RM&E efforts at the project and contract level feed into a designed system that yields constructive, valuable and timely feedback on species trends that can effectively inform recovery, mitigation, and harvest programs. Regional collaboration on the monitoring data matrix will help guide expectations on what population data is needed and will be available at the regional level.

The Fish and Wildlife Program (FWP) would benefit from aligning BPA contracting and reporting (e.g. work elements) with the data management needs outlined in the above approach. Given data collection efforts are not always focused solely on Regional needs, and data management expertise varies across field project managers, the FWP should continue to encourage enterprise level information management at the agency level that is capable of translating information into formats needed by the Region. For BPA-funded programs, a regionally coordinated data management system, with adopted metrics and HLIs under a monitoring framework, would help direct RM&E projects to channel results into this metric/indicator matrix. Projects that monitor salmon and steelhead populations could then provide data to the CA in the proper data exchange standard format as deliverables under contract requirements, supporting the identified consensus data needs of the region. The Council program would further benefit if monitoring matrices for other species groups were then developed using the CA process.

It is anticipated that priority species, populations, indicators, and metrics for monitoring and data sharing will again be determined by the ExComm after discussions between BPA, NOAA, state and tribal fisheries agencies, and others. These discussions then drive implementation at the StreamNet project as part of CA. As such they form an important part of the AM process for the region’s salmon and steelhead recovery efforts. It is also important to note that 74.9% of the StreamNet annual budget ($1,500,350 in FY 2019) is direct pass-through to partner agencies, used to fund data management staff and infrastructure needed to monitor these fish populations.

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RPA 72.1 Participate & jointly fund support in reg coordination forums

1. CA is a collaborative, consensus based effort. The vision of the project is that high level indicators are standardized for specific regional data needs on a prioritized basis. A longer term schedule for the Coordinated Assessments Project is developed, including a general outline of when the next indicators will come on line. Close contact with HLI users (BPA, NPCC, NOAA, others) and with regional fish and wildlife managers is maintained via the StreamNet Executive Committee. The Committee relies on collaboration, and consensus is used for decision making wherever possible. Other parties (e.g. resident fish managers, habitat managers, etc.) will be recruited as needed, as CA moves to additional indicators.

Since the adoption of the CA five year and StreamNet Strategic Plans, the Executive Committee has increasingly focused the efforts of the project on CA. The CA plan is revisited annually to ensure alignment with regional priorities, and changed as needed if regional priorities change. The plan will require additional resources to be fully implement. Since the resources allotted to the project have remained fairly static, even as costs have slowly risen, expansion into other data categories has been limited. Standardizing data compilation and reporting under variable field conditions has also proven more difficult than anticipated. In addition, BPA has provided clear direction on the priorities that they wish to see implemented. In 2016, BPA identified priority populations that were associated with data needs for the FCRPS BiOp. These were categorized by Bonneville as either Tier 1 (highest Priority) or Tier 2 (next highest priority). Other StreamNet data could be looked at as Tier 3 data. BPA requested that StreamNet, including all StreamNet partners, focus efforts on obtaining as much data as possible for Tier 1 & 2 priority populations, with Tier 3 data efforts occurring opportunistically and only when they do not delay higher priority work.

This focus on obtaining standardized data and associated trends information for these priority populations has continued to the present day. In combination, this focus and relatively static resources devoted to the project has resulted in a lack of progress on expanding into other indicators and species, such as hatchery and resident fish data, as originally planned in the StreamNet Strategic and CA 5 Year plans.

1. In 2018 the Executive Committee again set priorities and revised the CA 5 year plan (https://www.streamnet.org/revised-coordinated-assessments-5-year-plan-adopted-by-executive-committee/). The Committee again made populating the existing natural origin indicators the priority for FY 2018. Sharing and displaying SARs for superpopulations with FPC & CRITFC was included. We continue to work with CRITFC tribes and specifically with the CRITFC Inter-Tribal Monitoring and CRITFC StreamNet Library projects (2008-507-00 and 2008-505-00) projects to integrate these 3 projects and maximize data sharing.



1. The Coordinated Assessments (CA) effort has successfully reviewed and implemented data sharing for most natural origin salmon and steelhead populations in the Columbia River Basin, to the extent that population-scale data is available. The StreamNet Executive Committee (SNEC) is the leadership team for this effort, and recommends that membership be expanded, to include all federal, state, and tribal fish and wildlife managers involved in data collection for species and populations. Full participation in the CA project is needed to ensure continued progress in coordinated regional data management. Developing and sharing regional High Level Indicators (HLIs) will provide the Northwest Power and Conservation Council (NPCC), Bonneville Power Administration (BPA), and NOAA Fisheries the ability to efficiently evaluate and report on their respective roles in fish and wildlife mitigation and recovery.

NOAA’s Columbia Basin Task Force, the NPCC, BPA, and the respective states and tribes are developing a monitoring framework for natural origin salmon and steelhead populations that balances available resources with the need to monitor populations. As appropriate monitoring levels are designated for each population, implementation and data sharing should be coordinated through application of the CA process. Continued support for efforts to coordinate and implement a consistent, sustainable regional direction, including StreamNet, PNAMP, the tribal ITMD project, the CRITFC StreamNet Library, and the Regional Coordination forum, is invaluable and should be continued.

The SNEC should be tasked with implementing a monitoring data matrix for fish species under the F&W Program. The Council should clearly articulate realistic, sustainable and affordable long-term fish populations reporting goals under the F&W Program that engage all responsible regional parties, including Federal and non-Federal utilities. Regional F&W managers should prioritize monitoring to ensure that RM&E efforts at the project and contract level feed into a designed system that yields constructive, valuable and timely feedback on species trends that can effectively inform recovery, mitigation, and harvest programs. Regional collaboration on the monitoring data matrix will help guide expectations on what population data is needed and will be available at the regional level.

It is anticipated that priority species, populations, indicators, and metrics for monitoring and data sharing will again be determined by the ExComm after discussions between BPA, NOAA, state and tribal fisheries agencies, and others. These discussions then drive implementation at the StreamNet project as part of CA. As such they form an important part of the AM process for the region’s salmon and steelhead recovery efforts. It is also important to note that 74.9% of the StreamNet annual budget ($1,500,350 in FY 2019) is direct pass-through to partner agencies, used to fund data management staff and infrastructure needed to monitor these fish populations.

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 RPA 72.2

1. The Coordinated Assessments (CA) Project is an effort to develop efficient, consistent, and transparent data-sharing among the co-managers (fish and wildlife agencies and Tribes) and regulatory/funding agencies (BPA and NOAA) of the Columbia River Basin (CRB) for anadromous fish related data. The project has been coordinated by PNAMP and the PSMFC StreamNet project since its inception in 2010 (see: https://www.pnamp.org/project/coordinated-assessments-for-salmon-and-steelhead). A 5-year Plan for the CA project is reviewed and approved annually by the StreamNet Executive Committee. The Executive Committee is made up of fisheries professionals at the policy level from all member organizations, as well as CRITFC, NOAA-Fisheries, USFWS, PSMFC, BPA, PNAMP and the NPCC. CRITFC member tribes have been invited to participate on both the Executive Committee and Steering Committee and sometimes attend. The tribes have made it clear that lack of funding restricts their ability to participate. The 5-year Plan prioritizes data for contribution from partners.

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In addition to CA, StreamNet maintains the Data Store archive service, which allows agencies and projects that don’t have the capability to host and maintain data sets online to upload and preserve their data in a secure data repository, making them widely available. StreamNet also maintains the Council’s HEP and Protected Areas archives, as well as substantial historical data on fish populations, habitat, hatcheries and harvest. This data is publicly available and searchable with an integrated query system.

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.

This project supports the 2018 Northwest Power and Conservation Council Fish and Wildlife Program. Specifically: Reporting on the program’s approved high-level indicator categories and fish and wildlife indicators (NPCC Program, [https://www.nwcouncil.org/fw/program/2014-12/Program page 101](https://www.nwcouncil.org/fw/program/2014-12/Program%20page%20101)).

1. During 2018 BPA outlined a significant budget issue confronting the F&W program, and requested assistance in finding budget savings. To assist in this effort, cuts from the proposed FY 19 budget totaling $82,512.95 were proposed and accepted. As a result, partner agencies did not receive an anticipated restoration of funding to FY 17 levels. This resulted in a net reduction of person-hours dedicated to the StreamNet supported partner projects. In addition, PSMFC staffing under the project was reduced from 4 FTE to 2.8 FTE, with some staff time shifted to other, non-BPA funded PSMFC contracts.

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| Freshwater harvest | 2,708 Trends | 1894-2015 | 41,724 |
| Protected areas | 29,524 Records | n/a | n/a |
| Fish distribution\* | 158,684 Features/Records | updated 2019 | n/a |
| Barriers | Discontinued. |  n/a | n/a |
| Facilities - dams\* | 7,882 Dams |  n/a | n/a |
| Facilities - hatcheries\* | 539 Hatcheries |  n/a | n/a |
| Marine Harvest | Discontinued. | n/a |  |
| Spawner/recruit estimates | Discontinued; replaced by CA RperS. | n/a |  |
| Maps (pre-built) | Discontinued. |  |  |
| Photographs | Discontinued. |  |  |

 \* Beginning in 2018, fish distribution, dams, and hatcheries (aka fish facilities) are being managed as spatial datasets (GIS layers) rather than as tables in a tabular database. StreamNet partners manage fish passage barrier data for their areas of focus, which informs the fish distribution spatial data that they contribute for compilation region-wide. However, given shifting priorities and reduced project funding, StreamNet no longer maintains and publishes a standardized region-wide fish passage barriers dataset. The StreamNet website directs users to the barriers data that is available from our partners.

1. The Fish and Wildlife Program would benefit from aligning BPA contracting and reporting (e.g. work elements) with the data management needs outlined in the above approach. A regionally coordinated data management system, with adopted metrics and HLIs under a monitoring framework, would help direct RM&E projects to channel results into this metric/indicator matrix. Projects that monitor salmon and steelhead populations could then provide data to the CA in the proper data exchange standard format as deliverables under contract requirements, supporting the identified consensus data needs of the region. The Council program would further benefit if monitoring matrices for other species groups were then developed using the CA process.

It is anticipated that priority species, populations, indicators, and metrics for monitoring and data sharing will again be determined by the ExComm after discussions between BPA, NOAA, state and tribal fisheries agencies, and others. These discussions then drive implementation at the StreamNet project as part of CA. As such they form an important part of the AM process for the region’s salmon and steelhead recovery efforts. It is also important to note that 74.9% of the StreamNet annual budget ($1,500,350 in FY 2019) is direct pass-through to partner agencies, used to fund data management staff and infrastructure needed to monitor these fish populations.

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RPA 72.3 Develop a reg mgmt strategy for water, fish & habitat data

1. The Coordinated Assessments (CA) Project is an effort to develop efficient, consistent, and transparent data-sharing among the co-managers (fish and wildlife agencies and Tribes) and regulatory/funding agencies (BPA and NOAA) of the Columbia River Basin (CRB) for anadromous fish related data. The project has been coordinated by PNAMP and the PSMFC StreamNet project since its inception in 2010 (see: https://www.pnamp.org/project/coordinated-assessments-for-salmon-and-steelhead). A 5-year Plan for the CA project, which is a regional data management strategy for fish, is reviewed and approved annually by the StreamNet Executive Committee. The Executive Committee is made up of fisheries professionals at the policy level from all member organizations, as well as CRITFC, NOAA-Fisheries, USFWS, PSMFC, BPA, PNAMP and the NPCC. CRITFC member tribes have been invited to participate on both the Executive Committee and Steering Committee and sometimes attend. The tribes have made it clear that lack of funding restricts their ability to participate. The 5-year Plan prioritizes data for contribution from partners.
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| Facilities - dams\* | 7,882 Dams |  n/a | n/a |
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In addition, the StreamNet data store is a repository for 128 additional related datasets, and is available for secure storage and sharing as needed.

[StreamNet Website](http://www.streamnet.org/)

The CA project is described and key documents are found on the PNAMP website:

 <http://www.pnamp.org/project/3129>

1. The Coordinated Assessments (CA) effort has successfully reviewed and implemented data sharing for most natural origin salmon and steelhead populations in the Columbia River Basin, to the extent that population-scale data is available. The StreamNet Executive Committee (SNEC) is the leadership team for this effort, and recommends that membership be expanded, to include all federal, state, and tribal fish and wildlife managers involved in data collection for species and populations. Full participation in the CA project is needed to ensure continued progress in coordinated regional data management. Developing and sharing regional High Level Indicators (HLIs) will provide the Northwest Power and Conservation Council (NPCC), Bonneville Power Administration (BPA), and NOAA Fisheries the ability to efficiently evaluate and report on their respective roles in fish and wildlife mitigation and recovery.

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