

THE COLVILLE TRIBES OKANOGAN BASIN MONITORING AND EVALUATION PROGRAM ANNUAL REPORT FOR 2006



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**Colville Confederated Tribes Fish and Wildlife
Department
Anadromous Fish Division**

**Colville Tribes Okanogan Basin Monitoring and Evaluation Report
for 2006**

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Executive Summary

The Colville Tribes Anadromous Fisheries Department undertook this effort in the spring of 2004 to provide essential information on habitat conditions and fish populations. The collected data has already greatly expanded the level of knowledge being used in planning efforts and for fisheries management in the Okanogan basin. Information related to status and trend for all salmon and steelhead within the Okanogan River basin requires a long-term vision and commitment to provide answers about population level action effectiveness.

The Okanogan Basin Monitoring and Evaluation Program (OBMEP) is not just another regional monitoring strategy. Rather, this plan draws from the existing strategies (ISAB, Action Agencies/NOAA Fisheries, and WSRFB) and outlines an approach for addressing questions specifically related to anadromous fish management and recovery in the Upper Columbia Basin and more specifically the Okanogan River Basin. The Okanogan M&E program is specifically designed to monitor key components of the ecosystem including biological, physical habitat, and water quality parameters. The program will also contain components to develop baseline assessments where data are currently unavailable.

The plan is designed to do status, trend and effectiveness monitoring. It addresses questions about habitat conditions and abundance, distribution, life-stage survival, and age-composition of anadromous fish in the Okanogan River Basin. The program ultimately will determine how these factors change over time. At the same time the program will eliminate duplication of work, reduce costs, and increase monitoring efficiency.

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Introduction

Federal hydropower projects, private power utility systems, habitat degradation, excessive harvest, and human development have all had major negative impacts on anadromous fish that once flourished in the Columbia River and its tributaries. A coordinated and comprehensive approach to the monitoring and evaluation of status and trends in anadromous salmonid populations and their habitats is needed to support restoration efforts in the Columbia Cascade Province and in the Okanogan sub-basin in particular. Currently, independent research projects and some monitoring activities are conducted by various state and federal agencies, tribes, and to some extent by watershed councils or landowners, but there has been no overall framework for coordination of efforts or for interpretation and synthesis of results until the Okanogan Basin Monitoring and Evaluation Project (OBMEP).

Managers often implement actions within tributary streams to improve the status of fish populations and their habitats. Until recently, there was little incentive to monitor such actions to see if they met their desired effects. Now, however, many programs require that funded actions include monitoring efforts and coordinated measures to reduce duplication or contrary effort and to provide a process for more universal reporting and strategic planning. Within the Upper Columbia Basin, several different organizations, including federal, state, tribal, local, and private entities currently implement tributary actions and conduct monitoring studies. Each monitoring effort has different goals and objectives therefore entities use different monitoring approaches and protocols. In some cases, different entities are measuring the same (or similar) things in the same streams with little coordination or awareness of each others efforts. The Upper Columbia Regional Technical Team (RTT) is aware of this problem and desires a monitoring strategy or plan that reduces redundancy, increases efficiency, and meets the goals and objectives of the various entities.

We have used the structure and methods employed by the Monitoring Strategy for the Upper Columbia Basin (Hillman 2006) and extended and modified it for the Okanogan sub-basin. This project is identified as a high priority based on the high level of emphasis the NPCC Fish and Wildlife Program, Sub-basin Plans, NOAA fisheries guidance, and the Independent Scientific Review Panel have placed on monitoring and evaluation. The overall goal of this program is to provide the real-time data needed to guide restoration and adaptive management in the region.

OBMEP was specifically designed to monitor key components of juvenile fish production, habitat condition, water quality, and adult enumeration. The program also fills identified data gaps, and examines future research needs throughout the Okanogan River watershed.

Methods

As adapted from Hillman (2006), we implemented the EMAP sampling framework, a statistically based and spatially explicit sampling design, to quantify trends in juvenile and adult salmonids and status and trends in stream habitats. In 2006, 50 randomly selected sites were sampled for juvenile salmonids, redds, water quality, flow, temperature and physical habitat conditions in the Okanogan River sub-basin from late March through February 2006.

Protocols were developed specifically for the Okanogan Basin Monitoring and Evaluation Project. Current protocols developed to date can be viewed at our web-site: <http://nrd.colvilletribes.com/obmep/>.

Project Goals

This monitoring plan requires a long-term commitment as most outcomes will not be realized for 7 to 20+ years. This project is designed to ultimately answer these questions:

1. What are the current habitat conditions and abundance, distribution, life-stage survival, and age-composition of anadromous fish in the Okanogan River Basin (status monitoring)?
2. How do the above factors change over time (trend monitoring)?
3. Are tributary habitat actions effective for increasing fish populations and improving habitat conditions (baseline effectiveness monitoring)?
4. What is the cumulative effect of watershed management actions on fish populations (effectiveness monitoring)?

The plan is designed to address these questions and at the same time eliminate duplication of work, reduce costs, and increase monitoring efficiency. The implementation of valid statistical designs, probabilistic sampling, standardized data collection protocols, consistent data reporting methods, and selection of sensitive indicators will increase monitoring efficiency.

For this plan to be successful, all organizations involved must be willing to cooperate and freely share information. Cooperation includes sharing monitoring responsibilities, adjusting or changing sampling methods to comport with standardized protocols, and adhering to statistical design criteria. In those cases where the standardized method for measuring an indicator is different from what was used in the past, it may be necessary to measure the indicator with both methods for a few years so that a relationship can be developed between the two methods. Scores generated with a former method could then be adjusted to correct for any bias.

Accomplishments

I. Complete field protocol manuals

Final field protocol manuals for physical habitat, water quality, rotary screw trap, snorkeling, invertebrate sampling, redd surveys and video documentation can be viewed at: <http://nrd.colvilletribes.com/obmep/>

II. Complete, manage, and maintain database.

In 2006 we began conversion of data collected in Excel spreadsheets into an Access database as a progression towards developing a functional relational database. The database is needed

to efficiently address reporting needs for this project and allow us to provide information rapidly when requested. At the end of this contract in 2006, we are using an Access® database developed from our contractor, Summit Environmental Consultants Ltd., which contains tables of all of our data we collect for OBMEP. Summit has also developed protocols for transferring data collected on Trimble® handheld data loggers, data forms and the internet into our database. Considerable progress has been made and the elements of a database have been assembled that provide a framework for functional data management. Queries have been written by Summit Environmental and Bio-analysts that are fully consistent with ISEMP and the goals of OBMEP. Data collected and queries written are fully consistent with metadata and data management standards developed by CSMEP, stream-net, and NED for monitoring and evaluation projects in the Columbia River basin. The OBMEP database and data are contained on the OBMEP server located the Colville Tribes Fish and Wildlife Department offices located in Omak, WA. NOAA Fisheries is working on creating a similar database structure. We are making certain that our database is capable of providing compatible data with all recommended and necessary metadata. A draft protocol document for translating data base components into the OBMEP database has been completed and can be seen at:

<http://nrd.colvilletribes.com/obmep/pdfs/ProtocolforenteringdataintotheOBMEPdatabaseDR AFT.pdf>

III. Design, build, and install picket-weir traps.

The Colville Confederated Tribes with the help of the ONA installed a picket-weir trap on Inkaneep Creek in the spring of 2006. Inkaneep Creek has had a recreational and subsistence fishery for many years for large spring migrating O. mykiss. However, the Canadian government agencies have never determined the true origin of the O. mykiss that make up this fishery. The goal was to determine if these fish are anadromous steelhead or adfluvial rainbow trout from Lake Osyoos. The Okanogan Nation Alliance attempted to trap a majority of the run and collect DNA samples from these fish. Fish collection began March 27th and concluded May 23rd. Results of this study are documented on our website at: <http://nrd.colvilletribes.com/obmep/pdfs/Steelhead%20Redd%20Survey%20in%20Canada%202006.pdf>.

In 2006, several counting mechanisms were in place on Bonaparte Creek, a picket weir trap and a video enumeration chute. The picket weir trap was installed 4/7/06 and 12 steelhead were trapped and passed up-stream including 2-females and 10-males. Omak Creek has a weir/trap installed at river km 1.5 to collect all fish migrating upstream. The Colville Tribes released 63 summer steelhead above the weir out of a total of 77 that were trapped. The other fourteen fish were collected for brood stock.

IV. Enumerate adult anadromous fish from select sites throughout the Okanogan subbasin using video monitoring.

We installed video cameras at Zosel Dam for adult enumeration in 2005 and installed a portable video counting station on one tributary, Bonaparte Creek, in 2006. Adult summer steelhead were enumerated at all sites and other species encountered were also enumerated along with any external marks. Data is stored on proprietary hard drives until reviewed, numeric data is then stored on the OBMEP server and distributed as appropriate. Data results

and analysis can be viewed in report form on our website at:
http://nrd.colvilletribes.com/obmep/pdfs/Colville_Video_Report_Final20070613.pdf.

V. Operate & maintain real-time discharge, water temperature gauging stations in the Okanogan subbasin.

Real time temperature data was collected at three sites on the Okanogan River in the United States at Oroville, Malott and Tonasket by the United States Geological Service under contract with the Colville Tribe. Data has been assimilated into on-going data collection activities within the USGS web sites. This data is available on the World Wide Web to provide transparent public access and appropriate credit given to BPA and the Colville Tribes is given for making this data available. For data on the Okanogan River at **Mallot**:

http://waterdata.usgs.gov/wa/nwis/dv?dd_cd=01%2C02%2C05%2C05%2C05&format=gif&period=365&site_no=12447200

Tonasket: <http://waterdata.usgs.gov/wa/nwis/uv?12445000>

Oroville: http://waterdata.usgs.gov/wa/nwis/dv/?site_no=12439500&agency_cd=USGS.

The Okanogan River watershed especially the Canadian portion has several tributaries with unknown discharge or temperature regimes. We continued cooperative agreements between the Okanogan Nation Alliance, The Ministry of Environment, Environment Canada, and the Colville Tribes to address these data gaps for Inkneep, McIntyre, and Shuttleworth Creeks. To view data go to: <http://scitech.pyr.ec.gc.ca/waterweb/disclaimerB.asp>

1. In the “View all Real Time Stations within” window, Select British Columbia and Choose the Order By: Station Name.
2. Scroll down the page and Click “I accept”.
3. Scroll through the station list and select the station you want to download then click go to
Station: INKANEAP CREEK NEAR THE MOUTH (08NM200)
VASEUX CREEK NEAR THE MOUTH (08NM246)
SHUTTLEWORTH CREEK AT THE MOUTH (08NM149)

VI. Install one real-time stream gauging station on Nine-Mile Creek.

One real-time gauging site capable of measuring discharge and temperature was installed on Nine-mile creek by the USGS. This data is available for public access at:
<http://nwis.waterdata.usgs.gov/nwis/uv?12438900>

VII. Collect water temperature data throughout the Okanogan River basin

The OBMEP program began in May of 2005 putting out Onset® temperature data loggers at the all of the annual and panel tributary sites. Sites were located at US EMAP sites located in tributaries and Canadian EMAP sites located in tributaries and the main-stem Okanogan River. OBMEP also funded real time temperature data gathering at three USGS gauging sites on the Okanogan River: Oroville, Tonasket and Malott and three Environment Canada gauging sites on Inkaneep, Vaseux and Shuttleworth creeks. Data collection at these sites began in March of 2005.

VIII. Collect water quality data throughout the Okanogan River basin

Water quality probes from Eureka Environmental collect data on temperature, dissolved oxygen, turbidity, conductivity, and pH. This year data was collected both in the United States and Canada. Probe readings were taken three times a month at 35 of the randomly selected EMAP sites in water year 2006 (October 2005 to October 2006). These sites were on the tributaries of the Okanogan River and associated with either the annual or panel 2 EMAP locations. Four sites on the Okanogan River and one site on the Similkameen River within the Okanogan River were also surveyed during this time period.

We began surveying new sites in October 2006 that are associated with the annual or panel 3 EMAP locations. This collection effort was not funded in further years and all water quality data from 2005 can be found on in our 2005 annual report (<http://nrd.colvilletribes.com/obmep/pdfs/Annual%20report%202005%20Final.pdf>). Data for water year 2006, October 2005 through September 2006 is contained in our 2006 water quality report that is being compiled currently and will be on our website in the future.

IX. Collection of physical habitat data at EMAP sampling sites.

Physical habitat data was collected at 50 (25 annual panel, 25 rotating panel) EMAP sampling sites consistent with protocols developed by the CT. 34 sites were surveyed in the United States portion of the Okanogan Basin by the Colville Confederated Tribes and 16 sites were surveyed in the Canadian portion of the Okanogan Basin by the Okanogan Nation Alliance.

Physical habitat data was collected at annual and rotating panel sampling sites per EMAP GRTS six panel sampling design (Peck et al. 1999). The 25 rotating panel sites change every year until after the fifth year when you return to the first panel (Hillman 2006). Physical habitat data was collected in electronic format on Trimble GPS data loggers. Information was collected pertaining to presence and composition of large woody debris; riparian vegetation structure; canopy cover; human disturbance; substrate composition; stream channel habitat types (pool, riffle, glide, etc.); and channel morphology.

Data collected in 2004 and 2005 was compared for indicators that were considered likely to remain consistent between years such as bank full width. These indicators showed little variation between years or between field crews. This indicates that efforts to utilize common protocols and the use of extensive training are producing data with little observer bias and high precision. This data can be viewed in our annual report from 2005 on our web site at: <http://nrd.colvilletribes.com/obmep/pdfs/Annual%20report%202005%20Final.pdf>

Once our database is fully developed and finalized, further analysis on our habitat data will be forth coming on our website in report form. Habitat data tables for data collected in Canada for 2006 can be seen in report form on our website at: <http://nrd.colvilletribes.com/obmep/pdfs/OBMEP%20Annual%20Report06%20FINAL.pdf>

X. Conduct steelhead redd counts from index sites throughout the Okanogan River subbasin

Okanogan river redd survey reaches were established after collecting data in 2005 (Arterburn et al. 2005). In addition to the main-stem reference areas, the following tributaries will be

surveyed, either over their entire length that is accessible to anadromous fish, or in reference reaches. These tributaries include: the Similkameen River, Bonaparte Creek, Tonasket Creek, Omak Creek, Antoine Creek, Tunk Creek, Ninemile Creek, Loup Loup Creek, Stapaloop Creek, Wildhorse Spring Creek, Inkaneep Creek and Vaseux Creek. As part of this survey effort the Colville Confederated Tribes surveyed the tributaries throughout the Okanogan River to determine barriers to anadromous fish. Data on steelhead redds and anadromous fish barriers can be viewed on our website at:

<http://nrd.colvilletribes.com/obmep/pdfs/2006%20steelhead%20spawning%20Final.pdf>
<http://nrd.colvilletribes.com/obmep/pdfs/Barriers%20to%20anadromous%20fish%20in%20the%20Okanogan%20River.pdf>

XI. Smolt trapping for data on outmigrating anadromous fish

Rotary screw trap data on summer/fall Chinook smolts and juvenile summer steelhead outmigrating from the Okanogan River subbasin was collected at the Okanogan River bridge at highway 20. Data from this effort can be viewed on our website at:

http://nrd.colvilletribes.com/obmep/pdfs/2006_Screw_Trap_Report_Final.pdf.

XII. Snorkel at EMAP sites throughout the Okanogan River subbasin

We collected data on fish relative abundance with a focus on juvenile summer steelhead at 50 EMAP sites throughout the Okanogan River basin. Data from these efforts can be viewed on our website at:

<http://nrd.colvilletribes.com/obmep/pdfs/2006%20snorkel%20report%20Final.pdf>

XIII. Conduct pilot study to determine best methods and indexes for macro invertebrates

Macro invertebrate sampling was done by the ONA of Canada following protocols established by the Colville Confederated Tribes and other regional contributors. This was a pilot project to help determine the feasibility of conducting long-term future data collecting of Macro-invertebrates throughout the Okanogan River basin. Data from this effort can be viewed on our web site at: <http://nrd.colvilletribes.com/obmep/pdfs/ONAbenthic2006.pdf>

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