



Statement of Work Report

Project Title: Monitor/Eval Okanogan Basin Pr
Project #: 2003-022-00
Contract Title: 2003-022-00 EXP MONITOR/EVAL OKANOGAN BASIN PRODUCTION
Contract #: 37004
Province: Columbia Cascade **Subbasin:** Okanogan
Workorder ID: 188017 **Task ID:** 1
Perf. Period Budget: \$608,753 **Perf. Period:** 3/1/2008 - 2/28/2009
Contract Type: Contract (IGC) **Pricing Type:** Cost Reimbursement (CNF)
Contractor(s): Colville Confederated Tribes (Prime - COLVILLE00)
BPA Internal Ref: 37004

SOW Validation: Last validated 03/07/2008 with 14 problems, and 8 reviewable items

Contract Documents:	Property Inventory (03/07/2008)	Property Inventory 2008
	Budget - Contract (03/07/2008)	Line-item budget 2008
	Budget - Subcontract (02/19/2008)	ONA Subcontract budget
	Budget - Subcontract (02/19/2008)	Summit Subcontract budget
	Budget - Subcontract (02/19/2008)	USGS Subcontract budget

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Work Element Table of Contents:

<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
A : 185. Produce Pisces Status Report - Periodic Status Reports for BPA		\$1,010	(0 %)
B : 132. Produce (Annual) Progress Report - Produce annual report based on tasks identified within this scope of work		\$20,346	(3 %)
C : 165. Produce Environmental Compliance Documentation - Environmental Compliance		\$7,600	(1 %)
D : 156. Develop RM&E Methods and Designs - PLACEHOLDER: Develop statistical design for various funding levels		\$0	(0%)
E : 157. Collect/Generate/Validate Field and Lab Data - Juvenile summer snorkel surveys at EMAP sites	*	\$26,067	(4 %)
F : 157. Collect/Generate/Validate Field and Lab Data - Okanogan River summer Chinook and steelhead smolt trapping	*	\$74,637	(12 %)
G : 157. Collect/Generate/Validate Field and Lab Data - Enumerate adult salmonid using underwater video at Zosel Dam	*	\$70,246	(12 %)
H : 157. Collect/Generate/Validate Field and Lab Data - Steelhead enumeration in tributary streams using picket weir traps and video counts	*	\$24,171	(4 %)
I : 157. Collect/Generate/Validate Field and Lab Data - Conduct census redd counts for summer steelhead throughout the Okanogan River subbasin	*	\$28,920	(5 %)
J : 157. Collect/Generate/Validate Field and Lab Data - PLACEHOLDER: Collect water quality data for all EMAP tributary sites	*	\$0	(0%)
K : 157. Collect/Generate/Validate Field and Lab Data - Collect physical habitat data at up to 50 EMAP sampling sites	*	\$91,233	(15 %)
L : 157. Collect/Generate/Validate Field and Lab Data - PLACEHOLDER: Collect and process macro invertebrate samples	*	\$0	(0%)
M : 157. Collect/Generate/Validate Field and Lab Data - Operate & maintain 6 real-time discharge, temperature gauging stations in Okanogan subbasin	*	\$73,048	(12 %)
N : 148. Install Flow Measuring Device - PLACEHOLDER: Install one realtime stream gauge on Salmon or Loup Loup creek	*	\$0	(0%)
O : 157. Collect/Generate/Validate Field and Lab Data - Collect continuous water temperature data from 31 tributary EMAP sites	*	\$28,059	(5 %)
P : 157. Collect/Generate/Validate Field and Lab Data - PLACEHOLDER: Address known data gaps in the Okanogan Basin (Predator Study)	*	\$0	(0%)



<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
Q : 119. Manage and Administer Projects - Manage Projects: produce invoices, accrual estimates, develop contracts, etc.		\$32,829	(5 %)
R : 189. Regional Coordination - Project coordination/public outreach		\$44,252	(7 %)
S : 161. Disseminate Raw/Summary Data and Results - Support of OBMEP web site and workshop/conference attendance		\$11,809	(2 %)
T : 160. Create/Manage/Maintain Database - Manage, maintain, and expand the OBMEP database		\$47,469	(8 %)
U : 162. Analyze/Interpret Data - Analyze collected and historical data on habitat, biological, and water quality parameters		\$27,058	(4 %)
Total:		<hr/>	
		\$608,754	

* Environmental Compliance (EC) needed before work begins.

Contract Description:

Performance and Budget Period: March 1 - February 28

Project title: Okanogan Basin Monitoring and Evaluation Program (OBMEP)

Project number: 200302200

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Project goal:

Monitoring and Evaluation of anadromous fish at a sub-basin scale requires a long-term commitment as most outcomes will not be realized for 7 to 20+ years. This project is designed to ultimately achieve these goals:

1. Determine if there is a meaningful biological change at the population scale for summer/fall, spring Chinook, sockeye, and steelhead in the Okanogan basin (7-20+ year time frame).
2. Determine if there is a meaningful change in selected physical habitat parameters over time (12-20+ year time frame).
3. Determine if selected water quality parameters are changing over time in the Okanogan basin (5-20+ year time frame).
4. Determine if change is occurring at specific locations throughout the Okanogan basin resulting from the cumulative benefits of habitat restoration actions (12-20+ year time frame).



5. Administer contracts and ensure that this effort continues in the long-term in a scientifically sound manner that ensures a closely coordinated effort across the Okanogan River Basin, Geo-political boundaries, Upper Columbia ESU, Columbia River basin, and Pacific Northwest region (20+ year time frame).

This program is designed to address a multitude of 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 efficacy. For this program 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.

Primary Goal for 2008:

Implement a basin wide monitoring and evaluation program to the best extent possible given limited funding. Collect data using standardized OBMEP protocols and construct or maintain needed infrastructure. Our efforts in 2007, will contribute to maintaining long-term data sets that will provide status and trend data for all anadromous fish species in the Okanogan River basin and provide a basis for evaluating the overall effectiveness of salmon recovery and restoration projects conducted throughout the basin.

Although this project has been limited by a lack of full funding, we will attempt to address as many fundamental questions related to management and recovery of anadromous salmonids as those funds allow. Including basic uncertainties about targeted fish population processes, with respect to both the trends in abundance and the factors regulating salmonid population dynamics. When coupled with well-coordinated management actions, this program will help resource managers prescribe integrated management actions and assess the successes and failures of achieving the desired abundance, distribution, and trends of targeted fish populations. Moreover, well-coordinated management actions, when coupled with this relevant monitoring and evaluation program will reduce uncertainty about the effect of actions on population productivity.

The Colville Tribes have used, extended, and modified the structure and methods employed by the Monitoring Strategy for the Upper Columbia Basin (Hillman 2004) for use in the Okanogan subbasin in the design of the OBMEP program. OBMEP is aligned tightly with the priorities expressed in Northwest Power and Conservation Council's (NPCC) Fish and Wildlife Program, Subbasin Plans, NOAA Fisheries guidance, 2004 BIOP, the Upper Columbia Salmon recovery Plan and the Independent Scientific Review Panel (ISRP) have placed on monitoring and evaluation.

The Okanogan subbasin plan calls for its vision to be supported by nine priority themes that represent the large scale agreement between all stake holders within the subbasin. The eighth theme is "continue Research, Monitoring, and Evaluation" and OBMEP is specifically linked to this activity;

"Continued Research, Monitoring, and Evaluation: To apply adaptive management and make informed decisions will require an on-going commitment to research, monitoring and evaluation. Research allows important questions to be answered in a scientific rather than subjective manner and allows the best possible decisions on how and why to take a specific course of action. A considerable lack of knowledge exists in the Okanogan and this situation will continue to exist without continued research efforts. Evaluation of monitoring data, remote sensing data, and information from areas outside the Okanogan subbasin will also provide a mechanism to determine if progress is being made toward achieving the priority themes, and objectives contained in the subbasin plan. To track progress and inaugurate an adaptive management process, the subbasin plan relies upon a sound monitoring framework outlined under the Okanogan Basin Monitoring and Evaluation Program (OBMEP). This program was developed concurrently with Bonneville's and NOAA fisheries IMW pilot studies in the Wenatchee, John Day and Salmon River systems; with guidance provided by the Pacific Northwest Aquatic Monitoring Partnership; the Coordinated Systemwide Monitoring and



Evaluation Projects; the federal Research Monitoring and Evaluation Program, and, is directly limited to the Upper Columbia Salmon Recovery plan as the monitoring vehicle for listed stocks in the Okanogan subbasin. This monitoring plan will also continue to evolve as the region continues toward a fully integrated regional monitoring approach, but has at its core, the ability to effectively track status and trend for fish populations and habitat indicators in the interim. Specific monitoring elements targeting hatchery and wild fish performance, disease, genetics, fish morphology, ecological interactions and other parameters will be added as additional production programs come on line.”(Okanogan Subbasin Plan, Management Plan, page 9).

Within the Okanogan subbasin, independent research projects and piecemeal monitoring activities were conducted by various state, federal, tribal, agencies, and to some extent by watershed councils or landowners, until the creation of OBMEP. Today these efforts are coordinated into a cohesive overall framework for RM&E efforts related to salmon and steelhead fish stocks.

OBMEP is specifically designed to address status and trend monitoring for the Okanogan subbasin over the next 20+ years. Benefits to generating information on listed and non-listed fish will accrue in three different ways: (i) by supporting direct management of these species with respect to exploitation and recovery planning; (ii) by supporting the planning, development and implementation of restoration and recovery actions directly benefiting the listed and non-listed populations; and (iii) by supporting the planning, development and implementation of management actions indirectly impacting salmonid populations.

Sampling Design:

The intent of status/trend monitoring is to accurately describe existing conditions in the basin and to document changes in conditions over time. This requires temporal and spatial replication and probabilistic sampling. As adapted from Hillman (2004), 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 and riparian habitats. For more information see Hillman (2004).

In the Okanogan basin, EMAP sites were selected according to the generalized random tessellation stratified design (GRTS+) (Stevens 1997; Stevens and Olsen 1999; Stevens and Urquhart 2000; Stevens 2002). Briefly, the GRTS design achieves a random, nearly regular sample point pattern via a random function that maps two-dimensional space onto a one-dimensional line (linear space). A systematic sample is selected in the linear space, and the sample points are mapped back into two-dimensional space. The GRTS design is used to select samples for all panels. OBMEP site selection process began with collaboration with Tony Olsen and the EPA regional office located in Corvallis, OR who provided the random sample of 300 possible sites. Once selected OBMEP then verified these sites for access, secured landowner permissions when necessary, and reduced the list to the 150 sites split between the United States and Canada portions of the Okanogan basin. A map of these sites can be obtained off our web-site at: <http://nrd.colvilletribes.com/obmep/uscanisites.htm>

The Monitoring Strategy for the Upper Columbia Basin (Hillman 2004) recommends a suite of biological and physical/environmental indicators suitable for status and trend monitoring. Not all indicators listed in the Hillman document are relevant for the Okanogan subbasin. The protocols provide general instructions for collecting data, but specific methodologies that alter temporal, spatial, and economic realities make sampling some of the indicators more feasible than others. The indicators selected and the methods used to collect these data were adapted from Hillman (2004). Protocols were developed specifically for the Okanogan Basin Monitoring and Evaluation Project (OBMEP) to be compatible with both the Monitoring Strategy for the Upper Columbia Basin (Hillman 2004) and the Ecosystems Diagnosis and Treatment (EDT) model input fields. The Ecosystem Diagnosis and Treatment process was previously used to identify limiting factors for anadromous fish in the assessment portion of the Okanogan Subbasin Plan and its ongoing use will require periodic updates of these data provided through OBMEP in future iterations.

To summarize data management activities to date, considerable investments have been made in developing a functional database system that allows for data to be collected in the field and assimilated with a minimum of man power and repetitive analysis can be conducted at the push of a single key. However, what remains to be completed is to connect this database with the regional data repositories like Stream-net. This work is



beyond this scope of work but is acknowledged that OBMEP will play a roll in helping the region close this gap. OBMEP generates data and provides information, knowledge and expertise to BPA, NPCC, CSMEP, the Pacific Northwest Aquatic Monitoring Partnership (PNAMP) and other established regional monitoring programs in the Columbia River basin. We will continue to provide input and products derived from our own experiences in the Okanogan. On a more local scale, OBMEP provides information to state-wide salmon recovery efforts and regional forums across the upper Columbia ESU and Columbia Cascade province. We coordinate monitoring and evaluation efforts with the Upper Columbia Regional Technical Team and with the Wenatchee subbasin RM&E program (BPA #200301700). We work to ensure that data collected from our efforts can be "rolled-up" with data from other regional populations for broader, spatial scale application.

The Okanogan River is an international watershed and the OBMEP project does not stop at international borders. We facilitate collecting seamless data by collaborating with the Okanogan Nation Alliance (ONA), who in turn facilitates collaboration with other Canadian stakeholders such as Environment Canada, the Ministry of Land, Water, and Air Protection, and the Department of Fisheries and Oceans. We developed clear guidance for the collection of all field data. To vet our standardized field protocols, the Canadian effort in the Okanogan River basin was phased in one-year after data collection began in the United States portion of the Okanogan River basin. This allowed us to assess the compatibility of our guidance documents through field testing. Within the Okanogan subbasin, our efforts are coordinated with other management agencies and stakeholder groups that are collecting information to ensure that no duplication of efforts occurs within this watershed. Data are consolidated within the OBMEP program and onto a server located at our offices and also distributed to NMFS, UCSRB, and summarized into annual reports and presentations that are provided to BPA and other regional stakeholders on both sides of the border.

There have been numerous recent administrative and scientific calls for a comprehensive monitoring and evaluation program to provide consistent, region-wide information about the status of salmon populations and their response to management actions (Botkin et al. 2000, ISAB 2001, ISRP 2001). In addition, the Biological Opinion on the Federal Columbia River Power System requires the development and implementation of a coordinated monitoring and evaluation program (NMFS 2000a). The call for developing a consistent, region-wide monitoring program has been strong and widespread. Once implemented, the OBMEP project increases our ability to conduct effective recovery planning and address a number of outstanding scientific agendas. This comprehensive monitoring program provides a scientifically robust method for evaluating the status of populations while contributing information essential for evaluating the ESU for progress toward recovery goals such as the de-listing criteria defined by the regional TRT's (NMFS 2000b). A basin-wide monitoring program also provides the means to develop and refine appropriate performance measures and standards for conservation actions, thus giving managers the information to quantitatively assess the impact that composite restoration actions have on fish populations.

The OBMEP status, trend and effectiveness monitoring program will not only help address these scientifically-based policy agendas, but will also help provide the framework for addressing substantive administrative issues. One such issue is implementing requirements for developing the monitoring and evaluation program outlined in the NMFS 2000 Biological Opinion on the Federal Columbia River Power System (Actions 180-184, 188, 190, 191, 193, and 195-7), specifically population and habitat status monitoring for anadromous salmonids as required under Action Item 180, and elements of the habitat action effectiveness monitoring as required under Action Item 183.

Statement of Work Report

Work Element Details

A: 185. Produce Pisces Status Report

Title: Periodic Status Reports for BPA
Description: The contractor shall report quarterly on the status of milestones and deliverables in Pisces. When indicating a deliverable milestone as COMPLETE, the contractor shall provide metrics and the final location (latitude and longitude) prior to submitting the report to the BPA COTR.



Deliverable Specification:
ESUs:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Mar-Jun 2008 (3/1/2008 - 6/30/2008)	7/1/2008	7/15/2008	Inactive	
B. Jul-Sep 2008 (7/1/2008 - 9/30/2008)	10/1/2008	10/15/2008	Inactive	
C. Oct-Dec 2008 (10/1/2008 - 12/31/2008)	1/1/2009	1/15/2009	Inactive	
D. Final Jan-Feb 2009 (1/1/2009 - 2/28/2009)	2/14/2009	2/28/2009	Inactive	

B: 132. Produce (Annual) Progress Report

Title: Produce annual report based on tasks identified within this scope of work
Description: Develop annual report that documents the elements described in and generated from items contained in this scope of work.
 Estimated Level of Effort: 2 fisheries biologists for 1.0 month.

Deliverable Specification: Report will address:
 - Infrastructure development. How well are the major components of the system coming up to speed?
 - Hardware/software procurement, deployment, and serviceability (e.g., traps, weirs, video counting systems, handheld data recorders, etc.)
 - Data collection
 - Database development (from data entry through report generation).

Data summaries/presentations should be simple and focus on the items above, like % of EMAP-selected sites sampled, efficiency of traps and counting stations, etc. Data summaries should also illustrate how the program itself is working or needing improvement. Problems are acknowledged, learned from, and shared.

Data are compiled in a format that is useful and concise and raw-data are archived for future reference and analysis then incorporated into future technical reports.

ESUs:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Submit report for external and COTR review	6/1/2008	6/30/2008	Inactive	Use this milestone if the annual report requires external review. May be simultaneously reviewed by external parties and BPA COTR if desired.
B. Finalize Annual Report	7/1/2008	7/31/2008	Inactive	Integrate review feedback and comments, and obtain internal signatures if necessary. Convert the annual report to Adobe Acrobat PDF format.
C. Confirm BPA has posted the report	8/1/2008	8/31/2008	Inactive	It may take BPA ~30 days to get the report posted. To confirm posting of the report, search the BPA Publications database. http://www.efw.bpa.gov/Integrated_Fish_and_Wildlife_Program/technicalreports.aspx
Deliverable: D. Submit Final Annual Report to BPA COTR for posting		8/31/2008	Inactive	<i>See the Deliverable Specification above</i>

C: 165. Produce Environmental Compliance Documentation

Title: Environmental Compliance
Description: Develop and submit permit applications for installing traps, weirs, video counting stations, gauging stations, and other necessary infrastructure for collecting biological, water quality, and physical habitat data. Receive authorization by regulatory agency to install needed infrastructure items and collect biological data related to this monitoring and evaluation effort. This work element will minimize potential negative impacts of this project.

Estimated Level of Effort: 1 fisheries biologist for 0.8 months.

Deliverable Specification: Documentation and assistance to support BPA's Environmental Compliance Group (permit applications, ESA documents, etc.). Will vary based on the type of activity.



Planned Metrics: Are herbicides used as part of work performed under this contract?: No

ESUs:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Receive NEPA/ESA clearance from BPA for FY2007 work	3/1/2008	3/31/2008	Inactive	Most activities have no negative impacts of endangered summer steelhead or bull trout therefore HIP BIOP should cover most activities. Extremely low likelihood of encountering bull trout, so no consultation with USFWS necessary.
B. Receive permits needed to complete smolt trapping work in FY2008	3/31/2008	4/30/2008	Inactive	Receive shorelines and HPA permits
C. Complete/submit HPA and shorelines applications for FY2009	12/31/2008	2/28/2009	Inactive	HPA and shoreline permits are expected to be needed only for the Smolt trapping activities Work in 2008 will be designed to help secure 2009 permits.
D. Submit FY2009 SOW to EC group for NEPA/ESA review	12/31/2008	2/28/2009	Inactive	
Deliverable: E. Applicable permits and other environmental clearances received		2/28/2009	Inactive	<i>See the Deliverable Specification above</i>

D: 156. Develop RM&E Methods and Designs

Title: PLACEHOLDER: Develop statistical design for various funding levels
Description: Since the inception of the Okanogan Basin monitoring and evaluation project the funding levels authorized by BPA and the Northwest Power and Conservation Council have varied annually and ranged from \$391,333 to \$870,852. The result of these political decisions has resulted in inconsistent data collection activities. We hope to develop statistical boot strapping methods for filling in some of the data gaps that were created by wildly fluctuating funding levels. the OBMEP project was designed as a long term monitoring and evaluation project and it was assumed that the level of effort and necessary funding would remain constant over that 20 year period. Clearly after 4 years this assumption has not been meet and will require additional tools to address this funding variability that is likely to persist into the foreseeable future.

This work element will not be completed in FY08 unless additional funding is negotiated.

Deliverable Specification:
ESUs:

E: 157. Collect/Generate/Validate Field and Lab Data

Title: Juvenile summer snorkel surveys at EMAP sites
Description: Collect data on juvenile summer steelhead relative abundance at EMAP sites located in the United States and Canada. Snorkeling surveys will all be done following established OBMEP protocols There will be a high level of coordination with planners and other data collection agencies to achieve the best data available.

Sub-contract with ONA for sites in Canada.
 Estimated Level of Effort: Snorkeling- 3 Biologists for 1 month, 2 technician for 2 months.

Deliverable Specification: Based on snorkel counts, data on relative abundance, distribution, and size of juvenile summer steelhead correlated with habitat data at all tributary EMAP sampling locations. An annual technical report will be prepared and these data will be stored on the OBMEP server located at the Colville Tribes, Fish and Wildlife Department offices in Omak, WA.

Planned Metrics: * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Summer/Fall ESU | Steelhead - Upper Columbia River DPS

State: Multiple **Subbasin:** OKANOGAN
County: OKANOGAN **HUC6 Watershed:** Multiple



ESUs: Outside legal CKUCS (Upper Columbia River Spring-run Chinook Salmon ESU) boundary | Outside legal STUCR (Upper Columbia River Steelhead DPS) boundary | Upper Columbia River Steelhead DPS

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2008	3/31/2008	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Mobilize equipment and snorkel training	7/1/2008	7/15/2008	Inactive	Purchase, prepare equipment, and train field staff on fish identification and specific protocols
C. Snorkeling	7/15/2008	10/1/2008	Inactive	Snorkeling at 50 EMAP sites (25 annual, 25 rotating panel) looking for adult and juvenile anadromous fish.
D. Demobilize, repair, and securely store snorkeling equipment	10/1/2008	10/31/2008	Inactive	Demobilize, repair, and store snorkeling equipment.
Deliverable: E. Data on juvenile summer steelhead abundance at all EMAP locations		11/30/2008	Inactive	<i>See the Deliverable Specification above</i>

F: 157. Collect/Generate/Validate Field and Lab Data

Title: Okanogan River summer Chinook and steelhead smolt trapping
Description: Collect rotary screw trap data on summer/fall Chinook smolts and juvenile summer steelhead out-migrating from the Okanogan River subbasin. Smolt trapping will be done following protocols established by the Colville Confederated Tribes as part of the OBMEP project. There will be a high level of coordination to achieve the best data available with the least impact on endangered summer steelhead. Permits will be in place prior to any instream fish collection.

The rotary screw trap is located along the lower portion of the Okanogan River, below most of the spawning activity in the Okanogan basin. Section 10 permit authorizes up to two traps at this location. We will only operate up to 2 traps during the months from March to July..

Estimated Level of Effort: Smolt trapping- 2 Biologists for 2.5 months, up to 5 technicians for 2 months

Deliverable Specification: Data on abundance of out-migrating juvenile summer steelhead and summer/fall Chinook smolts will be the primary target although information on other anadromous fish species and any external marks or tags will also be collected from fish leaving the Okanogan River subbasin. Bismark brown stain for the first 50 juveniles captured each day will be used in mark-recapture estimates to develop trap efficiency estimates. Annual raw fish count data will be made available through the DART web-site and archived on the OBMEP server located at the Colville Tribes, Fish and Wildlife Department offices in Omak, WA. A technical report will be prepared using these data once every five years beginning in 2011.

Planned Metrics: * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Summer/Fall ESU | Steelhead - Upper Columbia River DPS

State: WA **Subbasin:** OKANOGAN
County: OKANOGAN **HUC6 Watershed:** LOWER OKANOGAN RIVER

ESUs: Outside legal CKUCS (Upper Columbia River Spring-run Chinook Salmon ESU) boundary | Upper Columbia River Steelhead DPS

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2008	3/1/2008	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Mobilize, install, and test smolt trapping equipment	3/15/2008	4/1/2008	Inactive	Mobilize, install, operate, and maintain rotary screw trapping equipment at the highway 20 bridge. Work will include training staff, installing trap, collecting fish, testing trap efficiency, maintaining or repairing equipment as needed, and removal and storage of equipment after data are collected.
C. Operate, maintain and collect data from smolt traps	4/1/2008	7/15/2008	Inactive	Operate and collect data from smolt traps every other day. Enumerate all smolts and bismark brown stain smolts.
D. Demobilize smolt trapping equipment and store securely	7/15/2008	7/31/2008	Inactive	Demobilize equipment (trap, trailer etc.) and store in a secure area until needed next year.
Deliverable: E. Data on out-migrating smolts and parr from the Okanogan River subbasin		2/28/2009	Inactive	<i>See the Deliverable Specification above</i>

G: 157. Collect/Generate/Validate Field and Lab Data

Title: Enumerate adult salmonid using underwater video at Zosel Dam
Description: Collect data on adult anadromous fish entering into Osoyoos Lake through the Zosel Dam fishways using video counting technology. The Zosel dam site will operate year round with the exception of the period from May 15 to July 15 as a result of limited personnel during the smolt trapping season. Video equipment was designed and installed at Zosel Dam for this project in 2005.

Estimated Level of Effort: 2 Biologists for 2.5 months, 4 technicians for 3.0 months.

Deliverable Specification: We installed video cameras at Zosel Dam for adult enumeration in 2005. Adult salmonids along with any external marks will be enumerated at Zosel Dam along with other fish families encountered. Data will be stored on proprietary hard drives until reviewed, Numeric data will then be archived on the OBMEP server and posted to the DART web page annually. A technical report be prepared to document spring spawners annually combining data from this an other data collection tasks but fall spawning salmonid enumeration along with resident fish data will be compiled into one report every five years beginning in 2010.

Planned Metrics:
 * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Steelhead - Upper Columbia River DPS | Sockeye - Okanogan River ESU | Chinook - Upper Columbia River Summer/Fall ESU | Chinook - Upper Columbia River Spring ESU

State: WA **Subbasin:** OKANOGAN
County: OKANOGAN **HUC6 Watershed:** UPPER OKANOGAN RIVER
ESUs: Outside legal CKUCS (Upper Columbia River Spring-run Chinook Salmon ESU) boundary | Upper Columbia River Steelhead DPS



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2008	3/1/2008	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Collect data at the Zosel dam video counting station	3/1/2008	5/15/2008	Inactive	Clean, maintain, monitor, and repair video equipment at Zosel Dam video counting station to ensure a complete and accurate count of all anadromous salmonids using the Zosel Dam fishways is completed in 2007 with the exception of the time frame from May 15 through July 15 when operations will be suspended in favor of smolt trapping as a result of reduced funding for this project.
C. Conduct annual maintainance and repair equipment	5/15/2008	7/15/2008	Inactive	
D. Continue data collection at the Zosel dam video counting station	7/15/2008	2/28/2009	Inactive	Clean, maintain, monitor, and repair video equipment at Zosel Dam video counting station to ensure a complete and accurate count of all anadromous salmonids using the Zosel Dam fishways is completed in 2007 with the exception of the time frame from May 15 through July 15 when operations will be suspended in favor of smolt trapping as a result of reduced funding for this project.
Deliverable: E. Data on adult anadromous fish passing Zosel Dam		2/28/2009	Inactive	<i>See the Deliverable Specification above</i>

H: 157. Collect/Generate/Validate Field and Lab Data

Title: Steelhead enumeration in tributary streams using picket weir traps and video counts
Description: Spring summer steelhead enumeration can be enhanced through the use of picket weir traps and video counting arrays. We will design and construct video counting equipment for Salmon and Ninemile Creek. Both of these creeks provide difficult environments for conducting spawner counts based upon redd surveys but provide excellent environments for collecting adult enumeration data using under water video. Spring counts of steelhead spawners can be done in Inkaneep Creek with a fish fence installed close to the creek mouth. The fence needs to be monitored twice daily beginning in April and running to June, depending on the run-timing. The fence will be operated daily for the three months to encompass 60 days of work.

This work element has been limited to include work on Inkaneep Creek Only due to limited funding.

Deliverable Specification: One picket weir trap will be operated on Inkaneep Creek to enumerate O.Mykiss entering the creek from Osoyoos Lake and these fish will be examined for sex, and origin. DNA and scale samples will be collected. for later evaluation. This work element has been greatly reduced due to limited funding.

Planned Metrics:
 * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Uncertainties Research

Primary Focal Species: Steelhead - Upper Columbia River DPS

State: BC

County:

Subbasin:

HUC6 Watershed:

ESUs: Outside legal CKUCS (Upper Columbia River Spring-run Chinook Salmon ESU) boundary | Outside legal STUCR (Upper Columbia River Steelhead DPS) boundary



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2008	3/1/2008	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Install trap into Inkaneep Creek	3/15/2008	4/1/2008	Inactive	Existing trap will be installed at the same site as was used in 2005. No permits are needed since this trap is located in Canada on Inkaneep band property and they have sovereignty over this property. The Okanogan Nation Alliance includes the Inkaneep Band and will be closely coordinating these activities.
C. Check trap	4/1/2008	6/30/2008	Inactive	Inkaneep trap will be checked twice daily and fish processed immediately to minimize stress while in operation.
D. Demobilize and store equipment	6/30/2008	2/28/2009	Inactive	Equipment will be maintained and stored by the Okanogan Nation Alliance.
Deliverable: E. Data on adult steelhead entering into Inkaneep Creek (only).		2/28/2009	Inactive	<i>See the Deliverable Specification above</i>

I: 157. Collect/Generate/Validate Field and Lab Data

Title: Conduct census redd counts for summer steelhead throughout the Okanogan River subbasin
Description: Collect data on steelhead redds in the united states portion of the Okanogan subbasin along with in Inkaneep Creek in Canada.

Estimated Level of Effort: Redd surveys- 2-Biologist for 1.5 months, 2 technician for 1.5 months. This work element could include up to 20 hours of overtime for personnel working on this work element to utilize when long survey reaches or abundant redds require extra time in the field.

Subcontract with ONA for redd survey on Inkaneep Creek.



Deliverable Specification:

Steelhead redd surveys will all be done following protocols established by the Colville Confederated Tribes for the OBMEP project. There will be a high level of coordination to achieve the best data available. Redd survey reaches were established after collecting data in 2005 and refined after data collection in 2006 and (Arterburn et al. 2005, Arterburn and Kistler 2006, 2007 Arterburn et al 2007). The reaches on the US portion of the Okanogan main-stem Okanogan River are:

- O1-Loop-loop Creek Rkm-26.3 downstream to Chiliwist Creek Rkm-24.4
- O2-Omak Creek Rkm-53.4 downstream to Salmon Creek Rkm-41.4
- O3-Riverside Rkm-66.1 downstream to Omak Creek Rkm-53.4
- O4-Janis Bridge Rkm-84.6 downstream to Riverside Rkm-66.1
- O5-Bonaparte Creek downstream to Janis Bridge Rkm-84.6
- O6-Confluence Rkm-119.5 downstream to Horseshoe Lake Rkm-105.6
- O7-Zosel Dam Rkm-127 downstream to Confluence Rkm-119.5

In addition to the mainstem reference areas, the following tributaries will be surveyed over their entire length that is accessible to anadromous fish, provided permissions from landowners can be secured. From the confluence upstream to the known anadromous barrier on:

- Similkameen River located at Enloe Dam Rkm-14.6
- Bonaparte Creek located at Bonaparte Falls Rkm-1.6
- Tonasket Creek located at Tonasket Falls Rkm-3.5

The following creeks are limited by private property permission issues:

- Tunk Creek is only accessible upstream of the confluence for 0.2km
- Nine Mile Creek is only accessible up stream of the confluence for 1.7km

Historically developed reference reaches will be surveyed on Omak Creek below Mission Falls as follows:

- OM-1 Confluence up stream to Lower Columbia River Rd bridge Rkm-2.0
- OM-2 Lower end of EMAP site#19 Rkm-5.3 to Mission Falls Rkm-9.0

Above Mission Falls randomly selected 1 kilometer reaches relating to the EMAP sampling sites will be used and include:

- OM-12 Jim Creek Bridge Rkm-29.4 up stream to EMAP site 12 Rkm-30.4
- OM-48 lower end of EMAP site 48 Rkm-26.8 up stream to Stapaloop Creek Rkm-27.8
- OM-366 lower end of EMAP site 366 Rkm-21.5 up stream to the Dutch Anderson Bridge Rkm-22.5
- OM-361 above Mission Falls Rkm-10.75 up stream to EMAP site 361 Rkm-11.75

Other tribal efforts will provide monitoring of steelhead redds in Stapaloop Creek and these data will be shared. Other tributaries such as Loop-loop, and Salmon creeks will be included in the future if passage issues allow sufficient water for fish to access these creeks.

Subcontract with ONA to conduct redd surveys on Inkaneep Creek from Falls downstream to confluence,

These data will be archived on the OBMEP server located at the Colville Tribes, Fish and Wildlife Department offices in Omak, WA. These data will be included as part of a spring spawner technical report that will be produced annually.

Planned Metrics:

- * R, M, and E Focal Area : Tributaries
- * Primary R, M, and E Type : Status and Trend Monitoring
- * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species:

Steelhead - Upper Columbia River DPS

State:

Multiple

Subbasin:

OKANOGAN

County:

OKANOGAN

HUC6 Watershed:

Multiple

ESUs:

Outside legal CKUCS (Upper Columbia River Spring-run Chinook Salmon ESU) boundary | Outside legal STUCR (Upper Columbia River Steelhead DPS) boundary | Upper Columbia River Steelhead DPS



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2008	3/1/2008	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Mobilize equipment and conduct first pass main-stem redd counts	3/15/2008	4/1/2008	Inactive	Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
C. Conduct second pass main-stem redd counts	4/1/2008	4/15/2008	Inactive	Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
D. Conduct third pass main-stem redd counts	4/15/2008	4/30/2008	Inactive	Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
E. Conduct tributary redd surveys and demobilize equipment	5/1/2008	7/15/2008	Inactive	Dates for surveys established from redd survey efforts conducted in previous years as part of this project
Deliverable: F. Spawner abundance, timing, and distribution data for summer steelhead		7/15/2008	Inactive	<i>See the Deliverable Specification above</i>

J: 157. Collect/Generate/Validate Field and Lab Data

Title: PLACEHOLDER: Collect water quality data for all EMAP tributary sites
Description: Water quality data will be collected at 19 tributary EMAP sites in the US as mainstem sites along the Okanogan and Similkameen Rivers are already covered as part of ongoing sampling conducted by Washington Department of Ecology. All 16 EMAP site will have data collect in Canada. Data will be collected following OBMEP protocols and Dissolved oxygen, Turbidity, Ph, Conductivity readings will be taken at each site 3 times per month.

A subcontract with ONA will be developed for the data collection in Canada

Estimated level of effort: 1 Biologist for 3 months and 3 technicians for 3 months

This work element will not be completed in FY08 unless additional funding is negotiated.

Deliverable Specification:

- Planned Metrics:**
- * R, M, and E Focal Area : Tributaries
 - * Primary R, M, and E Type : Status and Trend Monitoring
 - * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Summer/Fall ESU | Steelhead - Upper Columbia River DPS

State: **Subbasin:**
County: **HUC6 Watershed:**
ESUs:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete			Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).

K: 157. Collect/Generate/Validate Field and Lab Data

Title: Collect physical habitat data at up to 50 EMAP sampling sites



Description: Physical habitat data for up to 50 EMAP sampling sites.

Physical habitat data will be collected under pre-established protocols at 25 annual and 25 rotating randomly selected sampling sites. The 25 rotating panel sites change every year until after the fifth year when you return to the first panel. All panel sites will likely require monumenting prior to the physical habitat surveys after a five year period (site verification and monumenting for annual sites began in 2004 with documenting of sites scheduled to be completed by 2009).

Subcontract with ONA for 16 sites located in Canada.
 Estimated Level of Effort: 1 Biologists for 3.0 months, 3 Technicians for 3.0 months.

Deliverable Specification: Physical habitat data will be collected at 50 (25 annual panel, 25 rotating panel) including 34 sites in the United States and 16 sites in Canada using Trimble GPS data loggers. All physical habitat data collected at each sampling site will follow established OBMEP protocols. Information will be collected pertaining to presence and composition of large woody debris; riparian vegetation structure; canopy cover; human disturbance; substrate composition; embeddedness; side channel habitat; stream channel habitat types (pool, riffle, glide, etc.) and channel widths and depths. Physical habitat data from all 50 sampling sites will be archived on the OBMEP server located at the Colville Tribe's Fish and Wildlife office in Omak, WA, and forwarded to NMFS. A technical report will be written after five years of data are collected in 2009 and thereafter for each five years of data.

Planned Metrics:
 * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Chinook - Upper Columbia River Summer/Fall ESU | Steelhead - Upper Columbia River DPS

State: Multiple
County: OKANOGAN
Subbasin: OKANOGAN
HUC6 Watershed: Multiple

ESUs: Outside legal CKUCS (Upper Columbia River Spring-run Chinook Salmon ESU) boundary | Outside legal STUCR (Upper Columbia River Steelhead DPS) boundary | Upper Columbia River Steelhead DPS

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2008	3/31/2008	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Physical Habitat Surveys of about 20 sites	7/1/2008	7/31/2008	Inactive	Collection of physical habitat data under pre-established regionally accepted protocols at sites 1-20
C. Physical Habitat Surveys of about 20 sites	8/1/2008	8/31/2008	Inactive	Collection of physical habitat data under pre-established regionally accepted protocols at sites 21-40
D. Physical Habitat Surveys of about 10 sites	9/1/2008	10/30/2008	Inactive	Collection of physical habitat data under pre-established regionally accepted protocols at sites 41-50
Deliverable: E. Physical habitat data from 50 sites		2/28/2009	Inactive	<i>See the Deliverable Specification above</i>

L: 157. Collect/Generate/Validate Field and Lab Data

Title: PLACEHOLDER: Collect and process macro invertebrate samples
Description: Collect macroinvertebrate samples from all EMAP sample sites. These data will be collected using the PNAMP protocols to standardize data collection throughout the Columbia River basin. 50 samples will be collected annually and sent to an accredited laboratory for species identification and evaluation. Laboratory report will be included as part of the the annual report for this project and posted to our web site.

A subcontract for laboratory identification of all 50 samples will be entered into with Aquatic Biology Associates, Inc.

Estimated effort: 1 biologist for 2 months and 2 technicians for 1.2 months

This work element will not be completed in FY08 unless additional funding is negotiated.

Deliverable Specification: This work element will not be completed in FY08 due to limited funding.



Planned Metrics: * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Status and Trend Monitoring

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Chinook - Upper Columbia River Summer/Fall ESU | Steelhead - Upper Columbia River DPS

State: **Subbasin:**
County: **HUC6 Watershed:**
ESUs:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete			Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).

M: 157. Collect/Generate/Validate Field and Lab Data

Title: Operate & maintain 6 real-time discharge, temperature gauging stations in Okanogan subbasin
Description: Real-time data collection at gauging stations is critical to fisheries and regulatory agencies. The Okanogan River watershed has several tributaries where water quantity and temperature are limiting for fish populations. By expanding the existing suite of gauging station sites, considerable additional data can be collected with on-going operation and proper maintenance.

Estimated Level of Effort: 1 fishery biologist, 1.6 months and 1 office assistant for 1-month plus sub-contracts with USGS for U.S. gauging stations and ONA for Canadian effort through Environment Canada.

Deliverable Specification: Collect, verify, and post discharge, and temperature data at DOE, USGS, and Environment Canada real-time gauging stations throughout the Okanogan Basin using satellite up links. This project provides support for both real time discharge and water temperature data through Environment Canada at Inkameep Creek, and Shuttleworth Creek, and real-time water temperature data at USGS stations located along the Okanogan River mainstem at Oroville, Tonasket, and Malott, WA. The USGS gauging station located on Ninemile Creek is solely funded through this effort.

These data are accessible through the following web-sites;

USGS: <http://waterdata.usgs.gov/wa/nwis/rt>
 Environment Canada: <http://scitech.pyr.ec.gc.ca/waterweb/selectProvince.asp>
 DOE: <http://fortress.wa.gov/ecy/wrx/wrx/flows/station.asp?sta=498070>

A technical report that evaluated these data was prepared in 2007 and the next technical report relating to discharge is scheduled to be prepared in 2012. Temperature data is being archived and a specific temperature technical report will be prepared as time allows due to the massive amount of information that is being collected annually. We hope to complete this effort in 2008 or 2009 and each 5 years thereafter combining data from this and other work elements

Planned Metrics: * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Chinook - Upper Columbia River Summer/Fall ESU | Sockeye - Okanogan River ESU | Steelhead - Upper Columbia River DPS

State: Multiple **Subbasin:** OKANOGAN
County: OKANOGAN **HUC6 Watershed:** Multiple

ESUs: Outside legal CKUCS (Upper Columbia River Spring-run Chinook Salmon ESU) boundary | Outside legal STUCR (Upper Columbia River Steelhead DPS) boundary | Upper Columbia River Steelhead DPS



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2008	3/1/2008	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Develop agreements with Environment Canada and USGS to operate and maintain gauging stations	3/1/2008	2/28/2009	Inactive	Develop the contract or agreements to operate, maintain, and post water quality gauging data for both temperature and discharge in the Okanogan drainage.
C. Collect and post data collected at DOE, Environment Canada and USGS gauging stations	3/1/2008	2/28/2009	Inactive	Collect and post data collected at DOE, Environment Canada, and USGS gauging stations throughout the Okanogan River basin
Deliverable: D. Web accessible data for discharge and temperature		2/28/2009	Inactive	<i>See the Deliverable Specification above</i>

N: 148. Install Flow Measuring Device

Title: PLACEHOLDER: Install one realtime stream gauge on Salmon or Loup Loup creek
Description: Work with USGS to install real time gauging station on Loup Loup Creek or Salmon Creek.

A subcontract with USGS will be entered into for the actual equipment installation and O&M will be covered by another WE.

Estimate level of effort: 1 biologist for 0.4 months

This work element will not be completed in FY08 unless additional funding is negotiated.

Deliverable Specification:

Planned Metrics: Is the measuring device portable or fixed?: Fixed

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Steelhead - Upper Columbia River DPS

State: **Subbasin:**
County: **HUC6 Watershed:**
ESUs:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete			Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).

O: 157. Collect/Generate/Validate Field and Lab Data

Title: Collect continuous water temperature data from 31 tributary EMAP sites
Description: Water temperature is a critical limiting factor identified for the Okanogan River, therefore, it is important to understand temperature as it relates to anadromous fish throughout the Okanogan River basin. To properly measure changes in temperature over time requires highly detailed continuous temperature monitoring. The use of electronic technology allows continuous monitoring of water temperature at a multitude of sites both technically and economically practical. Data will be collected from 33 tributary EMAP sites with 16 located in Canada and 17 located in the United States. Temperature monitoring for the mainstem Okanogan River within the US will occur only at stream gauging stations under the previous work element.

Subcontract with ONA for data from 16 sites in Canada
 Estimated Level of Effort: 1 Biologists for 1.4 months, 1 Technician for 1.4 months.



Deliverable Specification: Temperature data will be collected continuously (once per hour) from October 1, 2007 to September 30, 2008 at the annual and year-4 panel, tributary EMAP locations and at USGS sites along the Okanogan River main-stem. Then in October of 2008, data loggers will be moved to the year-5 panel sites. Data loggers will be monitored and downloaded once per 3 months. The original 50 EMAP sites were reduced after reviewing long-term data sets collected along the Okanogan River main-stem (2004 annual report). These data showed that little additional information would be gained by collecting this data at multiple sites along the main-stem beyond what has been collected at already established monitoring sites. Temperature data is being archived and a specific temperature technical report will be prepared as time allows due to the massive amount of information that is being collected annually. We hope to complete this effort in late 2008 or early 2009 and each 5 years thereafter combining data from this and other work elements.

Planned Metrics: * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Steelhead - Upper Columbia River DPS | Chinook - Upper Columbia River Spring ESU | Chinook - Upper Columbia River Summer/Fall ESU | Sockeye - Okanogan River ESU

State: Multiple **Subbasin:** OKANOGAN
County: OKANOGAN **HUC6 Watershed:** Multiple

ESUs: Outside legal CKUCS (Upper Columbia River Spring-run Chinook Salmon ESU) boundary | Outside legal STUCR (Upper Columbia River Steelhead DPS) boundary | Upper Columbia River Steelhead DPS

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2008	3/1/2008	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Download data from January 2008 to present	3/1/2008	3/31/2008	Inactive	Data will be downloaded from electronic data logger once every quarter to protect against data lost from equipment malfunction or loss.
C. Download data from April 2008 to present	6/1/2008	6/30/2008	Inactive	Data will be downloaded from electronic data logger once every quarter to protect against data lost from equipment malfunction or loss.
D. Download data from July 2008 to present and relocate panel sites	10/1/2008	10/31/2008	Inactive	Data will be downloaded from electronic data logger once every quarter to protect against data lost from equipment malfunction or loss. Water temperature data is collected for a water year that begins in October and ends in October for each year. Rotating panel sites will be relocated at this time.
E. Download data from October 2008 to present	2/1/2009	2/28/2009	Inactive	Data will be downloaded from electronic data logger once every quarter to protect against data lost from equipment malfunction or loss. Winter data collection is contingent on weather and ice condition at each site.
Deliverable: F. Continuous water temperature data from 33 tributary EMAP sites.		2/28/2009	Inactive	<i>See the Deliverable Specification above</i>

P: 157. Collect/Generate/Validate Field and Lab Data

Title: PLACEHOLDER: Address known data gaps in the Okanogan Basin (Predator Study)
Description: Predation from abundant smallmouth bass in the Okanogan River represents perhaps a major mortality issue for recovery of anadromous fish stocks. This work element would be to develop a study to quantify the impact predators such as pike-minnow and smallmouth bass are having on juvenile salmonids. The first year of this study would be used to develop the experimental design and define this study. Actual data collection would occur in 2009 and continue for an appropriate time frame to account for inter annual variation provided funding can be secured.

This work element will not be completed in FY08 unless additional funding is negotiated.

Deliverable Specification:



Planned Metrics: * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Uncertainties Research
 * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Chinook - Upper Columbia River Spring ESU | Chinook - Upper Columbia River Summer/Fall ESU | Sockeye - Okanogan River ESU | Steelhead - Upper Columbia River DPS

State: **Subbasin:**
County: **HUC6 Watershed:**
ESUs:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete			Inactive	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).

Q: 119. Manage and Administer Projects

Title: Manage Projects: produce invoices, accrual estimates, develop contracts, etc.
Description: This task will be on-going to better track progress of individual tasks, products, and expenses and to help facilitate numerous sub-contacts that help produce deliverables for the scope of work. Cost includes office expenses for all employees associated with this SOW.

Estimated Level of Effort: 1 fisheries biologist, 1.4 months; Staff assistant 3.0 months; Contract specialist 1.0 months; Accounting Specialist 1.4 months, Office assistant 3.0 months, and Janitor for 1 day every two weeks.

Deliverable Specification: BPA Project Administration Requirements (Includes Contract Package (SOW, budget, and property inventory), Metrics and Locations Report, Financial Income Report, and Accrual Reports. All of the above components need to be completed by the due date.

Invoices, accrual estimates, SOW package, purchase orders, employee records etc. - Maintain files to include copies of sub-contracts, hours by staff, purchase orders for necessary items. Complete processing of accounts payable, invoices, employee hiring packets, and subcontracts as needed to complete tasks identified in this scope of work. Produce accrual estimates and other financial tasks requested by BPA. Provide SOW and budget to BPA for next year's work. Provide metrics information to BPA as requested.

ESUs:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Keep accurate records and support of data acquisition work elements	3/1/2008	2/28/2009	Inactive	
B. Accrual - Submit September estimate to BPA	8/20/2008	9/20/2008	Inactive	Provide BPA with an estimate of contract work that will occur prior to September 30 but will not be billed until October 1 or later. Generally, this should be done by September 10.
C. Provide BPA with 2008 SOW, budget, etc.	11/15/2008	12/1/2008	Inactive	90 days in advance of contract end date.
Deliverable: D. Deliverables as stipulated by BPA		2/28/2009	Inactive	<i>See the Deliverable Specification above</i>

R: 189. Regional Coordination

Title: Project coordination/public outreach



Description: OBMEP was developed under a regional Monitoring and Evaluation scheme involving coordination with multiple entities to ensure that all M&E efforts are compatible throughout the Columbia Basin and the region. The Okanogan subbasin is a trans-boundary watershed and therefore coordination with Canadian entities will be necessary. Coordination with multiple entities will be necessary as region-wide M&E efforts continue to evolve.

The OBMEP utilizes an EMAP sampling design provided by the EPA. Under this sampling design, 150 sampling sites (90 U.S., 60 Canadian) are randomly selected throughout the Okanogan watershed. As many of these sites fall within areas of private ownership, landowners must be contacted (public outreach) and access granted before field crews can conduct surveys. In years 2004, 2005, 2006, & 2007 landowners were contacted and permission granted as necessary to access the annual panel sites surveyed. Landowners will continue to be contacted in year 2008 to secure access to this year's panel sites.

Subcontract with ONA to provide support as needed in Canada
 Estimated Level of Effort: 2 Fishery Biologists for 2.5 months.

Deliverable Specification: OBMEP biologists will contact and coordinate directly with other entities performing M&E related activities within the region to ensure compatibility with other regional M&E and salmon recovery efforts. Private landowners will also be contacted under this task so that OBMEP field personnel may gain access to EMAP sampling sites. Landowner contacts and other coordination activities will be documented as part of the annual reporting WE.

ESUs:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Attend Regional Coordination Meetings	3/1/2008	2/28/2009	Inactive	Conduct coordination with regional M&E entities. We anticipate at least one meeting per month. Periodic RTT meetings when a presentation is requested. Upper Columbia Annual Pre-season Field Coordination Meeting.
B. Contact landowners for rotating panel to be sampled in 2007	3/1/2008	6/30/2008	Inactive	Contact private landowners and secure permission for EMAP sampling sites.
Deliverable: C. Coordination efforts will be described in the Annual Report		2/28/2009	Inactive	<i>See the Deliverable Specification above</i>

S: 161. Disseminate Raw/Summary Data and Results

Title: Support of OBMEP web site and workshop/conference attendance
Description: Workshops and conferences are periodically held by the American Fisheries Society, EPA, PNAMP, and other entities within the Columbia Basin. These workshops and conferences offer an important forum for information exchange between fisheries scientists. OBMEP biologists will attend these events only when requested to give formal presentations about OBMEP in an attempt to disseminate data collected. The dissemination of data to interested parties will primarily be done through the use of web based efforts.

Estimated Level of Effort: 2 fishery biologists for 0.8 months.

Deliverable Specification: Professional presentations, dissemination of raw data to interested parties, Additionally, OBMEP biologist will prepare and post material at our web-site.

Primary Focal Species: Chinook - Upper Columbia River Summer/Fall ESU | Steelhead - Upper Columbia River DPS

ESUs:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Develop content, post data, and reports on OBMEP web-site	3/1/2008	2/28/2009	Inactive	Develop, maintain, and update the OBMEP web-site based on current activities of the OBMEP project.
B. Attend RTT, Bilateral Okanogan workshop, and other regional R,M&E meetings	3/1/2008	2/28/2009	Inactive	Participate in regional forums on R, M&E including involvement with the Upper Columbia RTT monitoring and evaluation subcommittee, bilateral working group annual meeting to communicate with agencies in Canada, host three meetings between ONA and CCT to exchange programmatic information between agencies.
C. Present OBMEP information at western division AFS meeting in Portland, OR	5/1/2008	5/31/2008	Inactive	The OBMEP project has been requested to provide one or more presentations at the 2008 Western Division AFS meeting scheduled to be held in Portland, OR in May.
D. Attend practitioner's workshops for PNAMP and other PNAMP meetings	3/1/2008	2/28/2009	Inactive	PNAMP is the regional coordination group for R, M&E activities in the Pacific Northwest. It is important to maintain an active roll with this group to maintain compatibility between programs collecting data and people attempting to roll-up data to a larger scale. The practitioner workshops bring together other project managers to share information and solutions to common problems or issues.
Deliverable: E. Presentations at conferences, updated OBMEP website		2/28/2009	Inactive	<i>See the Deliverable Specification above</i>

T: 160. Create/Manage/Maintain Database

Title: Manage, maintain, and expand the OBMEP database

Description: To summarize data management activities to date, a database for this project has been in development since late 2005 to support ongoing collection of field data in the Okanogan basin and conduct limited status and trend analysis. The sampling protocols have mostly been defined but many data analysis questions remain for future development. Input routines have been completed and some output queries built but more work is needed especially in regards to automating the reporting of information in 2008.

Data auditing is an important step in our QA/QC efforts and should occur annually as part of the maintenance of a database system. Our efforts are closely linked to the ISEMP project and work that NOAA Fisheries and the Upper Columbia Salmon Recovery Boards are undertaking to roll data up to larger scales. Migration of data to larger scales will hopefully occur through these other efforts rather than directly from the OBMEP project as limited funding does not allow the necessary resources to integrate our data with these larger systems.

Subcontract with Summit Environmental to provide the primary technical resources for development and auditing, and database development; the Colville Tribes are responsible for data inclusion from data collection work elements for this work element.

Estimated Level of Effort: 3 Fishery Biologists for 0.8 months (Labor time is primarily related to data entry and input).

Deliverable Specification: Input and manipulation of data from 2006, 2007, and 2008 field collection and critical historical data identified by the Colville Tribes and other agencies working in the Okanogan sub-basin into the developed database. In addition, the primary OBMEP database will require modifications, updating, and auditing to maintain the integrity of the database and effectively assimilate collected data.

On-going operational maintenance is required because most computer systems and technology evolve and so must this database to keep pace. Enhanced automated reporting routines will help to fulfill technical reporting needs into the future as well as annual reporting work element needs.

The OBMEP data are currently secured at two other locations. We have a copy of our database being held by Summit Environmental in Vernon, BC and another held with the Upper Columbia Salmon Recovery Board located in Wenatchee, WA. In the future we plan to upload our data into the STEM databank being developed as part of the ISEMP project which will be located at Monte Lake, WA because once this happens all these data will become web accessible.

ESUs:



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Training and support of CCT staff in database use, hand-held data collectors, and data migrati	3/1/2008	2/28/2009	Inactive	
B. Modify and update database as needed	3/1/2008	2/28/2009	Inactive	
C. Develop customized output routines	3/1/2008	2/28/2009	Inactive	
D. Audit existing data contain within the OBMEP database	12/1/2008	2/28/2009	Inactive	
Deliverable: E. Input of this years data, plus modification and auditing of our existing database architecture		2/28/2009	Inactive	<i>See the Deliverable Specification above</i>

U: 162. Analyze/Interpret Data

Title: Analyze collected and historical data on habitat, biological, and water quality parameters
Description: Data gathered by the Colville Confederated Tribe and other agencies and individuals working in the Okanogan Basin will be synthesized and interpreted to confirm that all crucial data is being collected and that we will be able to draw conclusions from these data once a long-term data set is established. Additional analysis will occur as part of the annual report writing task as necessary. Trend analysis will be incorporated after year 5 of this project therefore the design work must begin in 2008 for this to occur. Automation work on database functions will be coupled to analytical routines wherever possible in order to minimize calculation errors. Statistical analysis will be developed using existing data and database structure.

Estimated Level of Effort: 3 Fishery biologists for 0.8 months. Subcontract for statistical support will be entered into through competitive bid process.

Deliverable Specification: We will gather data on habitat, water quality, and anadromous fish as defined in our protocols. We will then synthesize/summarize our collected data along with data gathered by other agencies into usable summary tables and graphs. We will hire a contractor to work with the EPA to analyze, interpret, and statistically test our collected data and then make decisions if we need different or more comprehensive data collection techniques in future years. After several years of data are compiled, status and trend analysis will begin (NMFS recommends minimum of 12 years of data for this analysis) but we will begin work with this analysis in year 5 (2008). We plan to focus our synthesis and analysis efforts on technical reports for Spring Spawner, snorkel surveys, and Temperature data in 2008.

Planned Metrics: * R, M, and E Focal Area : Tributaries
 * Primary R, M, and E Type : Status and Trend Monitoring
 * Secondary R, M, and E Type : Action Effectiveness Research

Primary Focal Species: Steelhead - Upper Columbia River DPS

ESUs:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Analyze and interpret data	8/1/2008	2/28/2009	Inactive	Synthesize data collected to develop models, interpret results, and run statistical analysis.
Deliverable: B. Data summaries of habitat, biological and water quality parameters		2/28/2009	Inactive	<i>See the Deliverable Specification above</i>