



### Statement of Work Report

**Project Title:** Okanogan Basin Monitoring & Evaluation Program (OBMEP)  
**Project #:** 2003-022-00  
**Contract Title:** 2003-022-00 EXP MONITOR/EVAL OKANOGAN BASIN PR  
**Contract #:** 46597 [ISSUED]  
**Province:** Columbia Cascade      **Subbasin:** Okanogan  
**Workorder ID:** 188017      **Task ID:** 1  
**Perf. Period Budget:** \$2,303,356      **Perf. Period:** 3/1/2010 - 2/29/2012  
**Contract Type:** Contract (IGC)      **Pricing Type:** Cost Reimbursement (CNF)  
**Contractor(s):** Colville Confederated Tribes (Prime - COLVILLE00)  
**BPA Internal Ref:** 46597  
**SOW Validation:** Last validated 02/11/2010 with 0 problems, and 0 reviewable items  
**Contract Documents:** [Property Inventory \(02/01/2010\)](#)      Property inventory  
[Budget - Contract \(02/11/2010\)](#)      Line Item budget with subcontracts



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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		\$4,446	(0 %)
B : 132. Produce (Annual) Progress Report - Produce annual report based on tasks identified within this scope of work		\$48,900	(2 %)
C : 165. Produce Environmental Compliance Documentation - Environmental Compliance		\$10,900	(0 %)
D : 156. Develop RM&E Methods and Designs - Revise OBMEP protocols as needed		\$52,800	(2 %)
E : 157. Collect/Generate/Validate Field and Lab Data - Monitoring changes in standing crop of fish and invertebrates at EMAP sites	*	\$140,000	(6 %)
F : 157. Collect/Generate/Validate Field and Lab Data - Okanogan River summer Chinook and steelhead smolt trapping	*	\$229,950	(10 %)
G : 157. Collect/Generate/Validate Field and Lab Data - Enumerate adult returns to the Okanogan River basin	*	\$410,000	(18 %)
H : 157. Collect/Generate/Validate Field and Lab Data - Monitor threats to salmonid habitats at up to 50 sites annually	*	\$280,000	(12 %)
I : 157. Collect/Generate/Validate Field and Lab Data - Fill data gaps related to water quality and quantity needed to evaluate status and trend	*	\$390,000	(17 %)
J : 119. Manage and Administer Projects - Manage Projects: produce necessary documents, estimates, and contracts plus direct office expenses		\$140,000	(6 %)
L : 191. Watershed Coordination - Project coordination/public outreach		\$155,000	(7 %)
M : 161. Disseminate Raw/Summary Data and Results - Support of OBMEP web site and workshop/conference attendance		\$49,000	(2 %)
N : 160. Create/Manage/Maintain Database - Manage, maintain, and expand the OBMEP database		\$310,000	(13 %)
O : 162. Analyze/Interpret Data - Analyze collected and historical data on habitat, biological, and water quality parameters		\$82,360	(4 %)
<b>Total:</b>		<b>\$2,303,356</b>	

\* Environmental Compliance (EC) needed before work begins.

**Contract Description:**

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. Within the first 7 years of this projects (proir to 2011) will be used to establish the program, all it's elements and establish a baseline to compare with future data collection. 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 in VSP parameter from the cumulative habitat restoration actions occurring throughout the Okanogan basin (12-20+ year time frame).
5. Administer contracts and ensure that this effort continues (long-term) in a scientifically sound manner that is closely coordinated 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, adhering to statistical design criteria, and strict use of informatics to distribute and archive data. 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 2010 and 2011:

Implement a basin wide monitoring and evaluation program to the best extent possible. Collect data using standardized OBMEP protocols and construct or maintain needed infrastructure. Our efforts in 2010 and 2011, will contribute to establishing a baseline for future comparisons add 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 we cannot hope to answer all possible management questions we will attempt to address as many fundamental questions related to management and recovery of anadromous salmonids as our funding allows. 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 documents and guideline put out by The Columbia Basin Monitoring and Evaluation Project (CSMEP), Pacific Northwest Aquatic Monitoring Partnership (PNAMP), Northwest Power and Conservation Council's (NPCC) Fish and Wildlife Program, Subbasin Plans, NOAA Fisheries guidance, 2008 BIOP and monitoring appendix P, the Upper Columbia Salmon recovery Plan, Upper Columbia Biological Strategy, The Upper Columbia Monitoring Strategy, Environmental Protection Agency (EPA), Washington Department of Ecology, and the Independent Scientific Review Panel (ISRP).

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 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 linked 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/us cansites.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. Work at this scale is beyond our scope but we 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. By 2011, Canada will have it's first full panel rotation completed. The phased approach 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, DART, 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 actions outlined in the NMFS 2000 Biological Opinion for the 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) regarding monitoring and evaluation more relevant than ever 3 BIOP's later making projects like OBMEP more important than ever.

## Statement of Work Report

### Work Element Details

#### **A: 185. Produce Pisces Status Report**

**Title:** Periodic Status Reports for BPA



**Description:** The Contractor shall report on the status of milestones and deliverables in Pisces. Reports shall be completed either monthly or quarterly as determined by the BPA COTR. Additionally, 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:**

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Mar-Jun 2010 (3/1/2010 - 6/30/2010)	7/1/2010	7/15/2010	Active	
B. Jul-Sep 2010 (7/1/2010 - 9/30/2010)	10/1/2010	10/15/2010	Active	
C. Oct-Dec 2010 (10/1/2010 - 12/31/2010)	1/1/2011	1/15/2011	Active	
D. Jan-Mar 2011 (1/1/2011 - 3/31/2011)	4/1/2011	4/15/2011	Active	
E. Apr-Jun 2011 (4/1/2011 - 6/30/2011)	7/1/2011	7/15/2011	Active	
F. Jul-Sep 2011 (7/1/2011 - 9/30/2011)	10/1/2011	10/15/2011	Active	
G. Oct-Dec 2011 (10/1/2011 - 12/31/2011)	1/1/2012	1/15/2012	Active	
H. Final Jan-Feb 2012 (1/1/2012 - 2/29/2012)	2/15/2012	2/29/2012	Active	

**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. Every effort will be made to provide our annual reports to BPA no later than July of the the year following when the data were collected.  
 Estimated Level of Effort: 0.65 FTEs/year.

**Deliverable Specification:** Report will address:  
 - Primary data collection efforts  
 - Infrastructure development, deployment, and serviceability (e.g., traps, weirs, video counting systems, handheld data recorders, etc.)  
 - Data summaries that address the status of fish populations and habitat threats.  
 - 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.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Submit report for external and COTR review	6/1/2010	6/30/2010	Active	Submit annual report for peer and COTR review
B. Finalize Annual Report	7/1/2010	7/31/2010	Active	Integrate review feedback and comments, and obtain internal signatures if necessary. Convert the annual report to Adobe Acrobat PDF format.
C. Upload report in Pisces	8/1/2010	8/31/2010	Active	Upload report
D. Submit progress report for external review and COTR review	6/1/2011	6/30/2011	Active	Use this milestone if the annual report requires external review. May be simultaneously reviewed by external parties and BPA COTR if desired.
E. Finalize report	7/1/2011	7/31/2011	Active	Integrate review feedback and comments, and obtain internal signatures if necessary. Convert the annual report to Adobe Acrobat PDF format.
F. Upload report in Pisces	8/1/2011	8/31/2011	Active	Upload report
<b>Deliverable: G. Submit Final 2009 and 2010 Annual Reports to BPA COTR for posting</b>		8/31/2011	Active	<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: 0.13 FTEs/year

**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

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Receive NEPA/ESA clearance from BPA for FY2010 and FY2011 work	3/1/2010	3/31/2010	Active	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. With an establish track report we should have no problem having permits extended to cover the 2 year period covered by our contract with BPA.
B. Receive permits needed to complete smolt trapping work in FY2010 and FY2011	3/31/2010	4/30/2010	Active	Receive shorelines and HPA permits for a 2 year period
C. Submit FY2012 and 2013 SOW to EC group for NEPA/ESA review	12/15/2011	12/31/2011	Active	Provide advance copy of SOW for completing BPA/EC requirements following the guidelines set forth by BPA.
<b>Deliverable: D. Applicable permits and other environmental clearances received</b>		2/28/2012	Active	<i>See the Deliverable Specification above</i>

**D: 156. Develop RM&E Methods and Designs**

**Title:** Revise OBMEP protocols as needed

**Description:** Since the Okanogan Basin Monitoring and Evaluation Program began the Colville Tribes recognized the importance of developing written protocols related to every aspect of data collection. Once developed these protocols are used to standardize data collection by all personnel throughout the Okanogan River basin using similar equipment. Good science needs to be repeatable and this is especially true when monitoring fish and environmental parameters over time. To keep up with methodological, technical, intellectual changes protocols need to be periodically updated. Once completed revised protocols will be used to guide the OBMEP data collections for the next 5 years.

Level of Effort: 0.34 FTEs/year

**Deliverable Specification:** Revised protocols will include sections for;

- Purpose
- Site selection
- Sampling duration
- Equipment list including details regarding mobilization and demobilization
- Permitting
- Detailed methodology and definitions
- QA/QC
- Data management
- Data analysis
- Literature cited







Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2010	3/15/2010	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, snorkel and invertebrate training	7/1/2010	7/15/2010	Active	Purchase, prepare equipment, and train field staff on specific protocol applications
C. Snorkeling all EMAP sites	7/15/2010	10/31/2010	Active	Snorkeling at 50 EMAP sites (25 annual, 25 rotating panel) looking for adult and juvenile anadromous fish.
D. Collect invertebrate samples at all EMAP sites	7/15/2010	10/31/2010	Active	Invertebrate sampling at 50 EMAP sites (25 annual, 25 rotating panel) looking for adult and juvenile anadromous fish.
E. QA/QC data and enter into the OBMEP database	7/15/2010	2/28/2011	Active	Enter data into the OBMEP database and apply appropriate QA/QC routines.
F. Process lab samples	7/15/2010	2/28/2011	Active	Send off samples for processing at a qualified laboratory
G. Demobilize, repair, and securely store all invertebrate sampling and snorkeling equipment	10/1/2010	2/28/2011	Active	Demobilize, repair, and store all sampling equipment.
H. Mobilize equipment, snorkel and invertebrate training	7/1/2011	7/15/2011	Active	Purchase, prepare equipment, and train field staff on specific protocol applications
I. Snorkel all EMAP sites	7/15/2011	10/31/2011	Active	Snorkeling at 50 EMAP sites (25 annual, 25 rotating panel) looking for adult and juvenile anadromous fish.
J. Collect invertebrate samples at all EMAP sites	7/15/2011	10/31/2011	Active	Invertebrate sampling at 50 EMAP sites (25 annual, 25 rotating panel) looking for adult and juvenile anadromous fish.
K. QA/QC data and enter into the OBMEP database	7/15/2011	2/28/2012	Active	Enter data into the OBMEP database and apply appropriate QA/QC routines.
L. Process lab samples	7/15/2011	2/28/2012	Active	Send off samples for processing at a qualified laboratory
M. Demobilize, repair, and securely store all invertebrate sampling and snorkeling equipment	10/1/2011	2/28/2012	Active	Demobilize, repair, and store all sampling equipment.
<b>Deliverable: N. Data on relative abundance of various fish and invertebrate species and at all EMAP locations</b>		2/28/2012	Active	<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. Sockeye salmon data is collected under cost share agreement with Chelan PUD under a separate contract.

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: 1.92 FTEs/year

**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 annual or a section within the annual report will be dedicated to a summary of these data with a more detailed technical report compiled after every 5 years of data collection.





**Description:** Enumerate adult returns to the Okanogan River basin.

Prior to this project adult spawning surveys for sockeye and summer Chinook were already occurring although the sockeye data had major discrepancies between these estimates and dam counts and the Chinook surveys were limited to the United States portion of the basin. Also no data on summer steelhead was being collected with the exception of in Omak Creek. To fill the remaining data gaps and allow for more accurate and precise population estimate to be calculated required considerable additional data collection. In order to collect the best possible data we use various methodologies including redd surveys for summer steelhead, picket weir traps, video counters, and PIT-tags depending on the fish being enumerated, information needs, size of the subwatershed, season when data are collected, water clarity and other environmental and logistical considerations. Once these data are collected we hope to determine annually the number of summer steelhead spawners entering each subwatershed, origin, and their spatial distribution. For summer Chinook and Sockeye we will provide annual escapement estimates into British Columbia this will help to validate or expand existing spawner surveys and allow for compellation of annual adult spawner abundance estimates, origin, and spatial structure. To accomplish this requires the following four specific activities; 1) video data will be collected at Zosel Dam, Salmon Creek, Antonie Creek, and Nine Mile Creek. 2) Picket Weirs will be operated in Inkaneep Creek, and data collected from other weir/traps operated for hatchery brood stock collection in Bonaparte and Omak Creeks. 3) summer steelhead redd surveys will be conducted in all remaining areas and 4) PIT-tag data will be incorporated where possible as antenna arrays are installed under project # 201003400 although these efforts will be funded outside of this specific project. We will continuously evaluate new technology and methodologies to collect the most scientifically defensible data possible yet still allow comparisons with past results in order to maintain a viable long term data set.

Estimated Level of Effort: 2.5 FTEs /year.

**Deliverable Specification:** The following data will be collected;

- 1) Year round video enumeration of all adult anadromous fish passing Zosel Dam
- 2) Seasonal data collected at a picket weir trap located on Inkaneep Creek, and at video counting stations located on Salmon, Antoine, and Ninemile creeks.
- 3) Summer steelhead redd surveys conducted throughout the rest for the United States portion of the watershed.

Numeric data related but not limited to species, origin, sex, marks, tags, length, weight, along ancillary data collected opportunistically such as life history type, and age will then be archived on the OBMEP server and posted to the DART web page annually. These data will be compiled with additional data collected under different projects and work elements to produce an annual spring spawner report and compile annual population estimates for the annual report for summer Chinook and Sockeye.

**Planned Metrics:**

- \* Primary R, M, and E Focal Area : Tributary Habitat
- \* Primary R, M, and E Type : Status and Trend Monitoring
- \* Secondary R, M, and E Type : Action Effectiveness Research
- \* Secondary R, M, and E Focal Area : Systemwide

**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 | Lamprey, Pacific

**Country:**

Multiple

**NPCC Subbasin:**

OKANOGAN

**State:**

Multiple

**HUC5 Watershed:**

Multiple

**County:**

OKANOGAN

**HUC6 Name:**

Multiple

**Salmonid ESUs Present:**

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



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2010	3/15/2010	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 and review video data from Zosel dam	3/1/2010	2/28/2012	Active	Clean, maintain, monitor, and repair video equipment at Zosel Dam video counting station and review data that is archived to ensure a complete and accurate count of all anadromous salmonids using the Zosel Dam fishways is completed in 2010 and 2011.
C. Review tributary video data collected at tributary video weirs	3/1/2010	6/1/2010	Active	Tributary video monitoring equipment will begin being installed by March 1st in the hopes that all equipment is operational no later than March 15 as long as weather allows. It is anticipated that the months of April and May will be when most summer steelhead will be observed passing through the video chamber.
D. Install a picket weir trap on Inkaneep creek to enumerate O.mykiss spawners	3/1/2010	6/1/2010	Active	Install a picket weir tap in Inkaneep Creek. This trap will be used to enumerate O. mykiss entering this tributary to spawn. Data collected at this site will include species, length, weight, sex, scales, and tissue samples for radio isotopic analysis to determine life history (resident or anadromous).
E. Mobilize equipment and conduct first pass main-stem Steelhead redd counts	3/15/2010	4/1/2010	Active	Conduct first round of main-stem Upper Columbia summer steelhead redd surveys. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
F. Conduct second pass main-stem redd counts	4/1/2010	4/15/2010	Active	Conduct second round of main-stem Upper Columbia summer steelhead redd surveys. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
G. Conduct third pass main-stem redd counts	4/15/2010	4/30/2010	Active	Conduct third round of main-stem Upper Columbia summer steelhead redd surveys. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
H. Conduct tributary redd surveys and demobilize equipment	5/1/2010	7/15/2010	Active	Conduct tributary redd surveys for Upper Columbia summer steelhead. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
I. Remove and store tributary video arrays	6/1/2010	2/28/2011	Active	Tributary video monitors will be removed once flow conditions require or the date of June 1 occurs as these devices are not intended to attempt to collect data during periods of uncontrolled spill. Equipment will be moved back to the Omak Fish and wildlife repaired as needed and secured in a safe place until needed next spring.
J. Review tributary video data collected at tributary video weirs	3/1/2011	6/1/2011	Active	Tributary video monitoring equipment will begin being installed by March 1st in the hopes that all equipment is operational no later than March 15 as long as weather allows. It is anticipated that the months of April and May will be when most summer steelhead will be observed passing through the video chamber.
K. Install a picket weir trap on Inkaneep creek to enumerate O.mykiss spawners	3/1/2011	6/1/2011	Active	Install a picket weir tap in Inkaneep Creek. This trap will be used to enumerate O. mykiss entering this tributary to spawn. Data collected at this site will include species, length, weight, sex, scales, and tissue samples for radio isotopic analysis to determine life history (resident or anadromous).
L. Mobilize equipment and conduct first pass main-stem redd counts	3/15/2011	4/1/2011	Active	Conduct first round of main-stem Upper Columbia summer steelhead redd surveys. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
M. Conduct second pass main-stem redd counts	4/1/2011	4/15/2011	Active	Conduct second round of main-stem Upper Columbia summer steelhead redd surveys. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
N. Conduct third pass main-stem redd counts	4/15/2011	4/30/2011	Active	Conduct third round of main-stem Upper Columbia summer steelhead redd surveys. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
O. Conduct tributary redd surveys and demobilize equipment	5/1/2011	7/15/2011	Active	Conduct tributary redd surveys for Upper Columbia summer steelhead. Dates for surveys established from redd survey efforts conducted in previous years as part of this project. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
P. Remove and store tributary video arrays	6/1/2011	2/28/2012	Active	Tributary video monitors will be removed once flow conditions require or the date of June 1 occurs as these devices are not intended to attempt to collect data during periods of uncontrolled spill. Equipment will be moved back to the Omak Fish and wildlife repaired as needed and secured in a safe place until needed next spring.



Milestone Title	Start Date	End Date	Status	Milestone Description
<b>Deliverable: Q. Data on adult anadromous fish</b>		2/28/2012	Active	See the Deliverable Specification above

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

**Title:** Monitor threats to salmonid habitats at up to 50 sites annually

**Description:** Physical habitat data will be collected under pre-established protocols at 25 annual and 25 rotating randomly selected sampling sites that follow an EMAP rotating panel design. All panel sites will have hard point monuments that allow these site to be precisely replicated with rotating panel. 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.

Subcontract with ONA for 16 sites located in Canada.  
Estimated Level of Effort: 1.22 FTEs/year

**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 completed in late 2009 or early 2010 and thereafter for each five years of data using EDT models to synthesize these data. Once finalized these technical reports will be posted to BPA and OBMEP web sites.

**Planned Metrics:**

- \* Primary R, M, and E Focal Area : Tributary Habitat
- \* Primary R, M, and E Type : Status and Trend Monitoring
- \* Secondary R, M, and E Type : Action Effectiveness Research
- \* Secondary R, M, and E Focal Area : Systemwide

**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

**Country:** Multiple **NPCC Subbasin:** OKANOGAN

**State:** Multiple **HUC5 Watershed:** Multiple

**County:** OKANOGAN **HUC6 Name:** Multiple

**Salmonid ESUs Present:** Outside legal CKUCS (Upper Columbia River Spring-run Chinook Salmon ESU) boundary (<multiple>) | Outside legal STUCR (Upper Columbia River Steelhead DPS) boundary (<multiple>) | Upper Columbia River Steelhead DPS (<multiple>)

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2010	6/30/2010	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	7/1/2010	7/31/2010	Active	Collection of physical habitat data under pre-established regionally accepted protocols at sites 1-20
C. Physical Habitat Surveys of about 20 sites	8/1/2010	8/31/2010	Active	Collection of physical habitat data under pre-established regionally accepted protocols at sites 21-40
D. Physical Habitat Surveys of about 10 sites	9/1/2010	10/30/2010	Active	Collection of physical habitat data under pre-established regionally accepted protocols at sites 41-50
E. Physical Habitat Surveys of about 20 sites	7/1/2011	7/31/2011	Active	Collection of physical habitat data under pre-established regionally accepted protocols at sites 1-20
F. Physical Habitat Surveys of about 20 sites	8/1/2011	8/31/2011	Active	Collection of physical habitat data under pre-established regionally accepted protocols at sites 21-40
G. Physical Habitat Surveys of about 10 sites	9/1/2011	10/30/2011	Active	Collection of physical habitat data under pre-established regionally accepted protocols at sites 41-50
<b>Deliverable: H. Physical habitat data from 50 sites</b>		2/28/2012	Active	See the Deliverable Specification above

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

**Title:** Fill data gaps related to water quality and quantity needed to evaluate status and trend





**Description:** Water quality data will be collected at one site in each of the subwatersheds plus areas of the main-stem that support anadromous fish throughout the Okanogan River basin. Most of these locations already have some form of data collection and our effort is designed to enhance the efforts that are already ongoing and to make sure no duplication of effort occurs. We will focus in coordinating the efforts of WDOE, USGS, and the Colville Tribes as the primary players that collect this information and work with others as needed. The WDOE covers real time discharge and hourly temperature for Bonaparte, Omak, Tunk Creeks and the Similkameen River additional stream gauge and water quality indicator sites are only rarely collected (minimum frequency is once every 6 weeks but can be as rare as once per year). USGS collects real-time discharge at several locations along the mainstem Okanogan River. Through this project the Colville Tribes will increase the frequency of data collection events especially for discharge (minimum frequency once per month but more often when possible) and temperature to real-time at all USGS gauging sites (this includes expanding the real-time discharge stations to Nine-mile Creek and placing temperature data loggers at all EMAP sites within the tributaries to account for longitudinal changes within each subwatershed. Water quality data will be enhanced to ensure that each subwatershed has at least one location where dissolved oxygen, turbidity, ph, and conductivity are collected in addition to temperature and discharge and the frequency of this data collection will be determined as time and resources allows but it is hoped this will occur at least once every 6 weeks at a minimum. Begin testing piezometers in the hope of developing a wide spread discharge monitoring point program thus linking discharge and temperature data.

Estimated level of effort: 1.87 FTEs/year

**Deliverable Specification:** Collect, verify, and post discharge, and temperature data at WDOE, 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 Inkaneep 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 Nine mile 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>

WDOE: <http://fortress.wa.gov/ecy/wrx/wrx/flows/station.asp?sta=498070>

Water quality data collected by the Colville tribes will be archived then reported every 5 years. 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 also 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 2010 or early 2011 and each 5 years thereafter combining data collected through 2009 from this and other work elements. Temperature data will be collected continuously (once per hour) from October 1 to September 30 of a given water year at annual and rotating panel, tributary EMAP locations and at USGS sites along the Okanogan River main-stem. Beginning in October of 2009, data loggers will be moved to the year-1 panel sites for a second rotation through the panel sites. Data loggers will be monitored and downloaded once per 3 months. The original 50 EMAP sites were reduced to between 33 and 37 per panel 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.

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

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

**Country:** Multiple **NPCC Subbasin:** OKANOGAN

**State:** Multiple **HUC5 Watershed:** Multiple

**County:** OKANOGAN **HUC6 Name:** Multiple

**Salmonid ESUs Present:** Outside legal CKUCS (Upper Columbia River Spring-run Chinook Salmon ESU) boundary (<multiple>) | Outside legal STUCR (Upper Columbia River Steelhead DPS) boundary (<multiple>) | Upper Columbia River Steelhead DPS (<multiple>)



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2010	3/15/2010	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	3/1/2010	6/28/2010	Active	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	3/1/2010	2/28/2011	Active	All data collected by DOE, Environment Canada, and USGS gauging stations with cost share from this program will be posted to the world wide web as part of the cost share.
D. Establish, collect data, and submit staff gauge data to WDOE per agreement	3/1/2010	2/28/2012	Active	The Colville Tribes have agreed to maintain data collection efforts at all WDOE water quality and quantity stations within the Okanogan River basin that would have otherwise been abandoned due to budget cuts. The Colville Tribes has agreed to collect data from these sites at least once per month and hopefully more often as time and resources allow.
E. Ensure that each anadromous fish bearing subwatershed has baseline water quality data	3/1/2010	2/28/2012	Active	Baseline water quality data includes Temperature, discharge, turbidity, conductivity, Ph, and dissolved oxygen for one full water year collected at least once every 6 weeks. These data will be collected as time and resources allow until all sub-watersheds have at least five solid years of data.
F. Download temperature data from January 2010 through March 2010	3/1/2010	3/31/2010	Active	Data will be downloaded from electronic data logger once every quarter to protect against data lost from equipment malfunction or loss.
G. Download temperature data from April 2010 through June 2010	6/1/2010	6/30/2010	Active	Data will be downloaded from electronic data logger once every quarter to protect against data lost from equipment malfunction or loss.
H. Download temperature data from July 2010 through September 2010 and relocate panel sites	10/1/2010	10/31/2010	Active	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.
I. Download temperature data from October 2010 through December 2010sent	2/1/2011	2/28/2011	Active	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.
J. Develop agreements with Environment Canada and USGS to operate and maintain gauging stat	3/1/2011	6/28/2011	Active	Develop the contract or agreements to operate, maintain, and post water quality gauging data for both temperature and discharge in the Okanogan drainage.
K. Download temperature data from January 2011 through March 2011	3/1/2011	3/31/2011	Active	Data will be downloaded from electronic data logger once every quarter to protect against data lost from equipment malfunction or loss.
L. Begin testing piezometers at WDOE staff gauge sites	3/1/2011	1/10/2012	Active	Install pressure transducers to determine staff gauge height and predict when temperature probes become dewatered at the existing WDOE manual staff gauge sites to see if data quality and quantity can be improved at a reduced cost.
M. Download temperature data from April 2011 through June 2011	6/1/2011	6/30/2011	Active	Data will be downloaded from electronic data logger once every quarter to protect against data lost from equipment malfunction or loss.
N. Download temperature data from July 2011 through September 2011 and relocate panel sites	10/1/2011	10/31/2011	Active	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.
O. Download data from October 2011 through December 2011	2/1/2012	2/28/2012	Active	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.
<b>Deliverable: P. Water quality and quantity data</b>		2/28/2012	Active	<i>See the Deliverable Specification above</i>

**J: 119. Manage and Administer Projects**

**Title:** Manage Projects: produce necessary documents, estimates, and contracts plus direct office expenses





**Description:** Manage Projects: produce invoices, accrual estimates, develop contracts, etc.

This task will be an on-going necessary expense related to project management that includes time for staff to hire and administer subordinate employees, 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 include only the direct expenditures by project staff and office related expenses directly related to this project and needed for the execution of this SOW.

In addition to covering to development of reporting documents such as invoices, budgets, and this SOW document. Additional tasks associated with providing office space and facilities is included. Tasks associated with building maintenance, construction, space leasing, remodeling costs, or improvements made to existing facilities are included to cover the needs of this project and the people that it supports. Their are also costs related to utilities and communications maintenance, and improvements needed.

Estimated Level of Effort: 0.53 FTE's/year

**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.

Maintain and improve the working environment for all employees working under this contract, pay direct cost such as telephone and utilities, office rent, and maintenance, provide office furniture, telephones, and computers needed to complete specific tasks identified in the SOW but not specifically identified under another deliverable.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Keep accurate records and support of data acquisition work elements	3/1/2010	2/28/2012	Active	Administrative and clerical support for this project.
B. Accrual - Submit September estimate to BPA	8/20/2010	9/10/2010	Active	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. Accrual - Submit September estimate to BPA	8/20/2011	9/10/2011	Active	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.
D. Provide BPA with 2012-2013 SOW, budget, etc.	11/15/2011	12/1/2011	Active	90 days in advance of contract end date.
<b>Deliverable: E. A properly administered project and other deliverables as stipulated by BPA</b>		2/28/2012	Active	<i>See the Deliverable Specification above</i>

**L: 191. Watershed Coordination**

**Title:** Project coordination/public outreach

**Description:** Project coordination/public outreach

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 experimental design for OBMEP utilizes an EMAP approach developed 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, & 2008 landowners were contacted and permission granted as necessary to access the annual sites surveyed. Landowners will be contacted annually to secure access to each year's panel sites or any replacement sites necessitated by changes in landowner or permission status on other sites.

Subcontract with ONA to provide support as needed in Canada  
 Estimated Level of Effort: 0.53 FTEs/year



**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.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Attend both local and regional meetings to conduct watershed coordination	3/1/2010	2/28/2012	Active	Conduct coordination with regional M&E entities. We anticipate at least two meetings per month. Regular attendance at Upper Columbia Regional Technical Team Meetings, Upper Columbia Annual Pre-season Field Coordination Meeting attendance, Occasional travel to attendance to meetings of the Pacific Northwest Aquatic Monitoring Partnership (most meetings will be monitored via conference call), Within basin coordination meeting with Okanogan Nation alliance and other agencies as needed but at least quarterly.
B. Contact landowners for rotating panel to be sampled in 2010	3/1/2010	6/30/2010	Active	Contact private landowners to secure or maintain permission for EMAP sampling sites.
C. Contact landowners for rotating panel to be sampled in 2011	3/1/2011	6/30/2011	Active	Contact private landowners to secure or maintain permission for EMAP sampling sites.
<b>Deliverable: D. Coordination efforts will be described in the Annual Report</b>		2/28/2012	Active	<i>See the Deliverable Specification above</i>

**M: 161. Disseminate Raw/Summary Data and Results**

**Title:** Support of OBMEP web site and workshop/conference attendance

**Description:** Support of OBMEP web site and workshop/conference attendance

Workshops and conferences are periodically held by the Upper Columbia Salmon Recovery Board, 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. However, OBMEP biologists will provide presentations related to our data as requested.

Estimated Level of Effort: 0.23 FTEs.

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

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

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Develop content, post data, and reports on OBMEP web-site	3/1/2010	2/28/2012	Active	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	3/1/2010	2/28/2012	Active	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. Attend and present information at other meetings as requested.
C. Attend practitioner's workshops for PNAMP and other PNAMP meetings	3/1/2010	2/28/2012	Active	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.
<b>Deliverable: D. Presentations at conferences, updated OBMEP website</b>		2/28/2012	Active	<i>See the Deliverable Specification above</i>

**N: 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 data analysis questions remain for future development. Input routines have been improving at a steady rate and continue to evolve and many output queries have been built but more work is needed especially in regards to automating of reports.

Since 2005, we have been building a tool that has served to mainly archive our existing data. It is our hope that by the end of 2011 we can move the database to the forefront of our monitoring efforts enabling more time reporting and data analysis. In order to achieve this will require broader use of electronic data collection and more rapid QA/QC conducted by our in house data analyst and completing the automated reporting programs currently under development.

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 OBMEP.

Subcontracts will provide specialized technical resources for 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: 0.55 FTEs/year with considerable subcontracting effort.

**Deliverable Specification:**

Input and manipulation of data from 2004, 2005, 2006, 2007, 2008, 2009, 2010 and 2011 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 data bank 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.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Training and support	3/1/2010	2/28/2012	Active	Training and support of CCT staff in the proper application of OBMEP field protocols, use of database tools, hand-held data collectors (Trimble), and data migration from web sites and to data archives.
B. Modify and update database as needed	3/1/2010	2/28/2012	Active	Databases are not simply created they evolve and over time we need to adjust and change our database to meet constantly changing needs.
C. Develop customized output routines	3/1/2010	2/28/2012	Active	Queries need to be written before useful data can be extracted from the database. Additionally databases have the ability of automating reports but these will need to be developed to ensure they meet the needs of a wide variety of users.
D. Audit existing data contain within the OBMEP database	12/1/2010	12/31/2010	Active	Data auditing allows us to ensure that data remains stable and valid. The OBMEP database is also maintained under proper quality control and assurance guidelines.
E. Audit existing data contain within the OBMEP database	12/1/2011	12/31/2011	Active	Data auditing allows us to ensure that data remains stable and valid. The OBMEP database is also maintained under proper quality control and assurance guidelines.
F. Input and revise historical data as needed	3/1/2010	2/29/2012	Active	Data assimilation for multiple sources requires ongoing effort to input both present and historical information and ensure that it meets our quality standards.
<b>Deliverable: G. Input of this years data, plus modification and auditing of our existing database architecture</b>		2/28/2012	Active	<i>See the Deliverable Specification above</i>

**O: 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 (2010). 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.

For example when it comes to analyzing temperature data we will consider the biological needs of the specific species of salmonid and life history stage involved. Because the needs of a fall spawner and spring spawner are temporally different therefore they experience temperature issues differently. Summer steelhead for example are more likely to be impacted by water temperatures in the spring and early summer resulting in losses to eggs or juveniles. Trend data will be identified based on the species and life history involved along with status temperature at a given site in order to determine thresholds (i.e. LC50 for summer steelhead during incubation is 18 degrees and below Zosel Dam this threshold is violated regularly so trends will look at the number of days in May and June that this threshold is violated each year plotted and a linear regression fitted to determine if this trend is improving or getting worse and if so at what rate. This is only one example but each data type will be considered in a similar context to apply biologically meaningful trends to each data set that provide important information for how environmental changes are affecting salmonids over time.

Estimated Level of Effort: 0.31 FTEs

**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 work to analyze, interpret, and statistically test our data in easily understood ways that provide rapid assimilation of complex and often complicated evaluations show users of these data can adaptively manage resources. Another focus of our evaluations will be to attempt to make our program and data collection activities more focused and efficient. After the 2010 data are collected and compiled, status and trend analysis will begin (NMFS recommends minimum of 12 years of data for this analysis). We plan to focus our synthesis and analysis efforts on technical reports for Spring Spawners, temperature, and smolt out migrations in 2010-2011.

**Planned Metrics:**

- \* Primary R, M, and E Focal Area : Tributary Habitat
- \* Primary R, M, and E Type : Status and Trend Monitoring

**Primary Focal Species:**

Steelhead - Upper Columbia River DPS

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Analyze and interpret data	8/1/2010	2/28/2012	Active	Synthesize data collected to summarize results in tables and graphs, interpret results, and run statistical analysis.
<b>Deliverable: B. Data summaries of habitat, biological and water quality parameters</b>		2/28/2012	Active	<i>See the Deliverable Specification above</i>

**Inadvertent Discovery Instructions**

BPA is required by section 106 of the National Historic Preservation Act (NHPA) to consider the effects of its undertakings on historic properties (16 USC 470). Prior to approving the expenditure of funds or conducting a federal undertaking, BPA must follow the section 106 process as described at 36 CFR 800. Even though BPA has completed this process by the time an undertaking is implemented, if cultural materials are discovered during the implementation of a project, work within the immediate area must stop and the significance of the materials must be evaluated and adverse effects resolved before the project can continue (36 CFR 800.13(b)(3)). The Inadvertent Discovery of Cultural Resources Procedure form outlines the steps to be taken and notifications to be made. If the undertaking takes place on tribal lands (16 USC 470w), BPA must also "comply with applicable tribal regulations and procedures and obtain the concurrence of the Indian tribe on the proposed action" (36 CFR 800.13(d)).

Inadvertent Discovery of Cultural Resources Procedure form:

<http://www.efw.bpa.gov/IntegratedFWP/InadvertentDiscoveryProcedure.pdf>