



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 PRODUCTION
Contract #: 55926
Province: Columbia Cascade **Subbasin:** Okanogan
Workorder ID: 188017 **Task ID:** 1
Perf. Period Budget: \$2,557,296 **Perf. Period:** 3/1/2012 - 2/28/2014
Contract Type: Contract (IGC) **Pricing Type:** Cost Reimbursement (CNF)
Contractor(s): Colville Confederated Tribes (Prime - COLVILLE00)
BPA Internal Ref: 55926
[SOW Validation:](#) Last validated 01/03/2012 with 0 problems, and 1 reviewable items
Contract Documents: [Property Inventory \(12/20/2011\)](#) Property Inventory
[Budget - Contract \(12/19/2011\)](#) Line Item 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		\$6,283	(0 %)
B : 165. Produce Environmental Compliance Documentation - Environmental Compliance		\$23,937	(1 %)
C : 156. Develop RM&E Methods and Designs - Revise OBMEP protocols as needed	*	\$56,964	(2 %)
D : 157. Collect/Generate/Validate Field and Lab Data - Monitoring changes in standing crop of fish and invertebrates at EMAP sites	*	\$243,363	(10 %)
E : 157. Collect/Generate/Validate Field and Lab Data - Okanogan River summer Chinook and steelhead smolt trapping	*	\$199,023	(8 %)
F : 157. Collect/Generate/Validate Field and Lab Data - Enumerate adult returns to the Okanogan River basin	*	\$431,986	(17 %)
G : 157. Collect/Generate/Validate Field and Lab Data - Monitor threats to salmonid habitats at up to 50 sites annually	*	\$320,550	(13 %)
H : 157. Collect/Generate/Validate Field and Lab Data - Fill data gaps related to water quality and quantity needed to evaluate status and trend	*	\$381,583	(15 %)
I : 119. Manage and Administer Projects - Manage Projects: produce necessary documents, estimates, and personnel management		\$145,967	(6 %)
J : 191. Watershed Coordination - Project coordination/public outreach		\$160,974	(6 %)
K : 161. Disseminate Raw/Summary Data and Results - Support of OBMEP web site and workshop/conference attendance		\$61,424	(2 %)
L : 160. Create/Manage/Maintain Database - Manage, maintain, and expand the OBMEP database		\$229,804	(9 %)
M : 162. Analyze/Interpret Data - Analyze collected and historical data		\$151,692	(6 %)
N : 141. Produce Other Report - Produce technical reports		\$132,608	(5 %)
O : 132. Produce (Annual) Progress Report - Produce annual report based on tasks identified within this scope of work		\$11,138	(0 %)
Total:		\$2,557,296	

* 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 (prior 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 2012 and 2013:

Continued implementation of existing standardized OBMEP protocols with adjustment made to improve analytical and reporting tools. Up to now, our efforts have largely focused on development of the infrastructure to collect high quality data and establishing a baseline of status data upon which future comparisons can be based. As we transition from our first round of data collection into our second we can enhance understanding of the anadromous fish populations and habitat within the Okanogan River basin with expanded trend analysis that is primarily focused on summer steelhead. These data can also be used in the Okanogan River basin as the basis for evaluating the overall effectiveness of salmon recovery and restoration projects.

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. This program will help resource managers prescribe well coordinated management actions and evaluate diagnostic units where progress or failures are occurring relative to measures of abundance, productivity, distribution, and trends.

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, 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 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, Environmental Protection Agency (EPA), Washington Department of Ecology, and the Independent Scientific Review Panel (ISRP). The intent of status/trend monitoring is to accurately describe existing conditions in the Okanogan River 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/uskansites.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 EDT 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 to establish a baseline then future iterations by which to make trend comparisons.

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. 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 hard 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 the Okanogan River anadromous fish 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. This work will help to address 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 within the Okanogan River.

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.

Estimated level of effort: 0.03-FTE

Deliverable Specification:

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Mar-Jun 2012 (3/1/2012 - 6/30/2012)	7/1/2012	7/15/2012	Inactive	
B. Jul-Sep 2012 (7/1/2012 - 9/30/2012)	10/1/2012	10/15/2012	Inactive	
C. Oct-Dec 2012 (10/1/2012 - 12/31/2012)	1/1/2013	1/15/2013	Inactive	
D. Jan-Mar 2013 (1/1/2013 - 3/31/2013)	4/1/2013	4/15/2013	Inactive	
E. Apr-Jun 2013 (4/1/2013 - 6/30/2013)	7/1/2013	7/15/2013	Inactive	
F. Jul-Sep 2013 (7/1/2013 - 9/30/2013)	10/1/2013	10/15/2013	Inactive	
G. Oct-Dec 2013 (10/1/2013 - 12/31/2013)	1/1/2014	1/15/2014	Inactive	
H. Final Jan-Feb 2014 (1/1/2014 - 2/28/2014)	2/14/2014	2/28/2014	Inactive	

B: 165. Produce Environmental Compliance Documentation

Title: Environmental Compliance

Description: Develop and submit permit applications for installing traps, weirs, video counting stations, gauging stations, electro-fishing and PIT tagging along with 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: 0.19 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. Copies and consultations will be provided for all applicable work performed during the performance period of this contract.

Planned Metrics:

- * Are herbicides used as part of work performed under this contract?: No
- * Will water craft, heavy equipment, waders, boots, or other equipment be used from outside the local watershed as part of work performed under this contract?: No



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Determine if contract work could adversely affect Pacific lamprey	3/1/2012	3/31/2012	Inactive	Contractor will review work proposed under this contract and determine the following: 1) Will field work take place in any area where lamprey may be present? (Any tributary or subbasin where anadromous fish exist is also accessible Pacific lamprey habitat.) 2) Are there any stream disturbing activities or instream activities that could adversely impact Pacific lamprey? Examples of activities posing a threat to lamprey may include (this list is not intended to be all-inclusive): aquatic habitat improvements, fish passage improvements, culvert replacements, water diversions, altered management of water flows, dewatering of any portions of streams, or alteration of irrigation practices. If you answer no to EITHER 1 or 2 above, the following does not apply. If the answer is yes to BOTH 1 and 2, the contractor must implement USFWS Best Management Practices to Minimize Adverse Effects to Pacific Lamprey (<i>Entosphenus tridentatus</i>) http://www.fws.gov/pacific/Fisheries/sphabcon/lamprey/pdf/Best%20Management%20Practices%20for%20Pacific%20Lamprey%20April%202010%20Version.pdf (BMPs). By Feb 15 each year, the contractor should report any lamprey observations during the previous calendar year to US Fish and Wildlife Service contacts listed at http://www.fws.gov/pacific/Fisheries/sphabcon/lamprey/ . This data should include date, location (river mile or GPS), number of individuals, and life stage. Report the life stage as ammocoete (larval stage with undeveloped eyes, found burrowed in substrate), macrophthalmia (free-swimming juvenile stage with developed eyes) or adult. See page 10 of the BMP document for pictures. This milestone end date should match the last day of any field work that could adversely impact Pacific lamprey, under this contract, or the Feb 15 reporting date, whichever comes later.
B. Inspect water craft, waders, boots, etc. to be used in or near water for aquatic invasive species	3/1/2012	2/28/2014	Inactive	Aquatic Invasive Species Guidance: Uniform Decontamination Procedures: http://www.aquaticnuisance.org/wordpress/wp-content/uploads/2009/01/Recommended-Protocols-and-Standards-for-Watercraft-Interception-Programs-for-Dreissenid-Mussels-in-the-Western-United-States-September-8.pdf -- Best management guidance for boaters: http://www.coastal.ca.gov/ccbn/bmp-boaters.pdf -- Aquatic Nuisance Species newsletter: http://www.aquaticnuisance.org/newsletters -- State Aquatic Invasive Species Management Plans: Oregon: http://www.clr.pdx.edu/publications/files/OR_ANS_Plan.pdf -- Washington: http://www.wdfw.wa.gov/publications/pub.php?id=00105 -- Montana: http://www.anstaskforce.gov/Montana-FINAL_PLAN.pdf -- Idaho: http://www.idahoag.us/Categories/Environment/InvasiveSpeciesCouncil/documents/Idaho%20Aquatic%20Nuisance%20Species%20Plan.pdf
C. Inspect and, if necessary, wash vehicles and equipment infested with terrestrial invasive species	3/1/2012	2/28/2014	Inactive	Prevent spread of invasive species
D. Participate in ESA Consultation	12/1/2012	3/1/2013	Inactive	Work may include drafting BA, completing HIP II BO Project Notification Form, providing copy of Section 10, 4(d), or 6 permit, etc.; or submitting Hatchery Genetic Management Plan to BPA for ESA consultation initiation, and providing input for the ensuing consultation.
E. Obtain/Renew applicable local, state, federal and tribal environmental permits	12/1/2012	3/1/2013	Inactive	All necessary permit will be obtained and copies provided to BPA before felid work begins
F. Obtain BPA's EC Lead sign-off that EC requirements are complete	3/1/2012	3/31/2012	Inactive	Per BPA protocol
Deliverable: G. Applicable permits and other environmental clearances received		4/1/2012	Inactive	<i>See the Deliverable Specification above</i>

C: 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. OBMEP protocols and methods have been entered into monitoringmethods.org. However, considerable consolidation and revisions will be necessary to finalize or publish these data. Over the term of this contract performance period we will consolidate, revise and publish all protocols used for OBMEP with an expectation that these revisions will remain static for a period of at least 4 years once completed.

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

Protocol: Scientific Protocol for Salmonid Habitat Surveys within the Columbia Habitat Monitoring Program (CHaMP)

Proposed Project:

Sites for this WE:

0

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Review, revise, and Publish protocol, study design, and methods in monitoringmethods.org	3/1/2012	2/28/2014	Inactive	The Protocol (including temporal and spatial design) and Methods for this work element are stored at monitoringmethods.org and need to be finalized (i.e., "Published" through monitoringmethods.org), preferably prior to data collection. Preparations for contract renewals must include reviewing any previously published Protocols/Methods to ensure that they are consistent with how work will be done in any subsequent contract.
Deliverable: B. Revised protocols		2/28/2014	Inactive	See the Deliverable Specification above

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

Title: Monitoring changes in standing crop of fish and invertebrates at EMAP sites

Description: Collect data on juvenile summer steelhead relative abundance and invertebrate community at EMAP sites located in the United States and Canada. Snorkeling surveys will all be done following established OBMEP protocols. Invertebrate data will be collected following establish and PNAMP recommended protocols. The primary use of these data will be as a response variable that relates to physical habitat changes monitored at these same sites. If we can establish that one method or the other is better suited to relating physical habitat changes to a biological response then we will focus primarily to that method in the future. There will be a high level of coordination with planners and other data collection agencies to achieve the best data available. Snorkel surveys will continue to provide presence and absence data regardless although the frequency and number of sites needed to collect these data would be far less in the future if invertebrate data show a closer link to habitat changes.

Sub-contract with ONA for sites in Canada and professional services used to pick, enumerate, and identify invertebrate samples.

Estimated Level of Effort: 0.58 FTEs/year

Deliverable Specification: Based on snorkel counts, data on relative abundance, distribution, and size of juvenile summer steelhead, Invertebrate community structure, correlated with habitat data at all tributary EMAP sampling locations. A technical report will be prepared comparing the advantages and disadvantages of each methodology at the end of a 5 year study (2015) and these data will be stored on the OBMEP server located at the Colville Tribes, Fish and Wildlife Department offices in Omak, WA. Yearly juvenile fish and invertebrate data will be summarized into the annual report.

- Planned Metrics:**
- * Primary R, M, and E Focal Area : Population Status
 - * 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 : Tributary Habitat

Primary Focal Species: 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>)

Data Repositories: Okanogan Basin Monitoring & Evaluation Program (OBMEP) website

Protocol: OBMEP-snorkel, macroinvertebrate, temperature, and water quality monitoring (2003-022-00)

Proposed Project:

Sites for this WE: 75

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2012	6/30/2012	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. Review, revise, and Publish protocol, study design, and methods in monitoringmethods.org	3/1/2012	2/28/2014	Inactive	The Protocol (including temporal and spatial design) and Methods for this work element are stored at monitoringmethods.org and need to be finalized (i.e., "Published" through monitoringmethods.org), preferably prior to data collection. Preparations for contract renewals must include reviewing any previously published Protocols/Methods to ensure that they are consistent with how work will be done in any subsequent contract.
C. Mobilize equipment, snorkel and invertebrate training	7/1/2012	7/15/2012	Inactive	Purchase, prepare equipment, and train field staff on specific protocol applications
D. Snorkeling all EMAP sites	7/15/2012	10/31/2012	Inactive	Snorkeling at 50 EMAP sites (25 annual, 25 rotating panel) looking for adult and juvenile anadromous fish.
E. Conduct pilot electrofishing validation of snorkel surveys on Omak Creek	7/15/2012	10/31/2012	Inactive	Conduct mark recapture estimates at snorkel sites on Omak Creek
F. Collect invertebrate samples at all EMAP sites	7/15/2012	10/31/2012	Inactive	Invertebrate sampling at 50 EMAP sites (25 annual, 25 rotating panel) looking for adult and juvenile anadromous fish.
G. QA/QC data and enter into the OBMEP database	7/15/2012	2/28/2013	Inactive	Enter data into the OBMEP database and apply appropriate QA/QC routines.
H. Process lab samples	7/15/2012	2/28/2013	Inactive	Send off samples for processing at a qualified laboratory
I. Demobilize, repair, and securely store all invertebrate sampling and snorkeling equipment	10/1/2012	2/28/2013	Inactive	Demobilize, repair, and store all sampling equipment.
J. Mobilize equipment, snorkel and invertebrate training	7/1/2013	7/15/2013	Inactive	Purchase, prepare equipment, and train field staff on specific protocol applications
K. Snorkel all EMAP sites	7/15/2013	10/31/2013	Inactive	Snorkeling at 50 EMAP sites (25 annual, 25 rotating panel) looking for adult and juvenile anadromous fish.
M. Collect invertebrate samples at all EMAP sites	7/15/2013	10/31/2013	Inactive	Invertebrate sampling at 50 EMAP sites (25 annual, 25 rotating panel) looking for adult and juvenile anadromous fish.
M. Conduct electrofishing validation study at all tributary EMAP sites	7/15/2013	10/31/2013	Inactive	Conduct mark recapture estimates at snorkel sites on all anadromous bearing tributaries in the United States.
N. QA/QC data and enter into the OBMEP database	7/15/2013	2/28/2014	Inactive	Enter data into the OBMEP database and apply appropriate QA/QC routines.
O. Process lab samples	7/15/2013	2/28/2014	Inactive	Send off samples for processing at a qualified laboratory
P. Demobilize, repair, and securely store all invertebrate sampling and snorkeling equipment	10/1/2013	2/28/2014	Inactive	Demobilize, repair, and store all sampling equipment.
Deliverable: Q. Data on relative abundance of various fish and invertebrate species and at all EMAP locations		2/28/2014	Inactive	<i>See the Deliverable Specification above</i>

E: 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 out-migrating from the Okanogan River subbasin. Smolt trapping will be a cost share between OBMEP and the Chief Joseph Monitoring Project following protocols established by the Colville Confederated Tribes as part of the OBMEP project. OBMEP will aid in the data collection effort but the program guidance and data analysis will all be rolled into the Chief Joe Hatchery M&E 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 and is good through 2015. We will only operate up to 2 traps during the months from March to July as water conditions allow.

Deliverable Specification: Estimated Level of Effort: 1.36 FTEs/year
Data on abundance of out-migrating juvenile 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 150 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 annually as part of the Chief Joseph Hatchery M&E project and a dedicated summary of these data with a more detailed technical report compiled after every 5 years of data collection.

Planned Metrics:

- * Primary R, M, and E Focal Area : Population Status
- * Primary R, M, and E Type : Status and Trend Monitoring
- * Secondary R, M, and E Type : Uncertainties Research
- * Secondary R, M, and E Focal Area : Tributary Habitat

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

Country: US **NPCC Subbasin:** OKANOGAN

State: WA **HUC5 Watershed:** LOWER OKANOGAN RIVER

County: OKANOGAN **HUC6 Name:** OKANOGAN RIVER/TALLANT CREEK

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

Data Repositories: Okanogan Basin Monitoring & Evaluation Program (OBMEP) website

Protocol: OBMEP-rotary screw trap (2003-022-00) **Proposed Project:** **Sites for this WE:** 1



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2012	3/31/2012	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).
B. Review, revise, and Publish protocol, study design, and methods in monitoringmethods.org	3/1/2012	3/15/2012	Inactive	The Protocol (including temporal and spatial design) and Methods for this work element are stored at monitoringmethods.org and need to be finalized (i.e., "Published" through monitoringmethods.org), preferably prior to data collection. Preparations for contract renewals must include reviewing any previously published Protocols/Methods to ensure that they are consistent with how work will be done in any subsequent contract. Existing OBMEP protocols have already been uploaded into monitoring methods but revisions and updating will occur as part of the Chief Joe Monitoring and Evaluation Project.
C. Mobilize, install, and test smolt trapping equipment	3/15/2012	4/1/2012	Inactive	Mobilize, install, operate, and maintain rotary screw trapping equipment at the highway 20 bridge. Work will include helping to install trap , collecting fish, testing trap efficiency, maintaining or repairing equipment as needed, and removal and storage of equipment after data are collected.
D. Operate, maintain and collect data from smolt traps	4/1/2012	7/15/2012	Inactive	Operate and collect data from smolt traps for 8 hours 5 days per week.
E. Demobilize smolt trapping equipment and store securely	7/15/2012	2/28/2013	Inactive	Demobilize equipment (trap, trailer etc.), repair as needed, and store in a secure area until needed next year.
F. Mobilize, install, and test smolt trapping equipment	3/15/2013	4/1/2013	Inactive	Mobilize, install, operate, and maintain rotary screw trapping equipment at the highway 20 bridge. Work will include helping to install trap , collecting fish, testing trap efficiency, maintaining or repairing equipment as needed, and removal and storage of equipment after data are collected.
G. Operate, maintain and collect data from smolt traps	4/1/2013	7/15/2013	Inactive	Operate and collect data from smolt traps for 8 hours 5 days per week.
H. Demobilize smolt trapping equipment and store securely	7/15/2013	2/28/2014	Inactive	Demobilize equipment (trap, trailer etc.), repair as needed, and store in a secure area until needed next year.
Deliverable: I. Raw data collection assistance related to out-migrating smolts and parr from the Okanogan River		2/28/2014	Inactive	<i>See the Deliverable Specification above</i>

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

Title: Enumerate adult returns to the Okanogan River basin



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; 1) the fish being enumerated, 2) information needs, 3) size of the subwatershed, 4) season when data are collected, 5) water clarity and 6) 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 to validate or expand existing spawner surveys and allow for compellation of annual adult summer steelhead 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, Antoine Creek, and Nine Mile Creek. 2) Picket Weir data will be shared but collected in Omak and Bonaparte Creeks under hatchery broodstock collection efforts. 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 PIT-tag antenna array O&M will be funded outside of this specific project. We will continuously evaluate new technology and methodologies to collect the most scientifically defensible data possible for summer steelhead adult abundance estimates yet still allow comparisons with past results in order to maintain a viable long term data set. A new approach for collecting adult summers steelhead data on Inkaneep Creek is needed as the adult picket wier trap has only been marginally successful over the last couple of years. At this time, the exact approach for data collecting in 2012 is unknown but being evaluated and alternatives considered. Once a specific approach is decided upon we will update the necessary documents.

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 Inkaneep Creek, and at video counting stations located on Salmon, Antoine, and Ninemile creeks. Primarily for steelhead, secondarily for chinook and sockeye.
- 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 summer steelhead.

- Planned Metrics:**
- * Primary R, M, and E Focal Area : Population Status
 - * 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 : Tributary Habitat

Primary Focal Species: Steelhead - Upper Columbia River DPS | Sockeye - Okanogan River ESU | Chinook - Upper Columbia River Summer/Fall 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 (accessible) | Outside legal STUCR (Upper Columbia River Steelhead DPS) boundary (accessible) | Upper Columbia River Steelhead DPS (accessible)

Data Repositories: Okanogan Basin Monitoring & Evaluation Program (OBMEP) website

Protocol: OBMEP-snorkel, macroinvertebrate, temperature, and water quality monitoring (2003-022-00) **Proposed Project:** **Sites for this WE:** 10

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2012	3/31/2012	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).
B. Review, revise, and Publish protocol, study design, and methods in monitoringmethods.org	3/1/2012	3/31/2013	Inactive	The Protocol (including temporal and spatial design) and Methods for this work element are stored at monitoringmethods.org and need to be finalized (i.e., "Published" through monitoringmethods.org), preferably prior to data collection. Preparations for contract renewals must include reviewing any previously published Protocols/Methods to ensure that they are consistent with how work will be done in any subsequent contract.



Milestone Title	Start Date	End Date	Status	Milestone Description
C. Collect and review video data from Zosel dam	3/1/2012	2/28/2014	Inactive	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.
D. Review tributary video data collected at tributary video weirs	3/1/2012	2/1/2014	Inactive	Tributary video monitoring equipment will begin being installed by March 1st in the hopes that all equipment is operational no latter 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.
E. Install a picket weir trap on Inkaneep creek to enumerate O.mykiss spawners	3/1/2012	2/1/2014	Inactive	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).
F. Mobilize equipment and conduct first pass main-stem Steelhead redd counts	3/15/2012	4/1/2012	Inactive	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.
G. Conduct second pass main-stem redd counts	4/1/2012	4/15/2012	Inactive	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.
H. Conduct third pass main-stem redd counts	4/15/2012	4/30/2012	Inactive	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.
I. Conduct tributary redd surveys and demobilize equipment	5/1/2012	7/15/2012	Inactive	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.
J. Remove and store tributary video arrays	6/1/2012	2/28/2013	Inactive	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.
K. Review tributary video data collected at tributary video weirs	3/1/2013	6/1/2013	Inactive	Tributary video monitoring equipment will begin being installed by March 1st in the hopes that all equipment is operational no latter 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.
L. Install a picket weir trap on Inkaneep creek to enumerate O.mykiss spawners	3/1/2013	6/1/2013	Inactive	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).
M. Mobilize equipment and conduct first pass main-stem redd counts	3/15/2013	4/1/2013	Inactive	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.
N. Conduct second pass main-stem redd counts	4/1/2013	4/15/2013	Inactive	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.
O. Conduct third pass main-stem redd counts	4/15/2013	4/30/2013	Inactive	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.
P. Conduct tributary redd surveys and demobilize equipment	5/1/2013	7/15/2013	Inactive	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.
Q. Remove and store tributary video arrays	6/1/2013	2/28/2014	Inactive	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.
Deliverable: R. Data on adult anadromous fish		2/28/2014	Inactive	<i>See the Deliverable Specification above</i>

G: 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.

To complete the population of the EDT model for the Okanogan River subbasin requires some additional habitat data to be collected in EDT reaches that are not currently being monitored through OBMEP's randomized monitoring approach. Rapid assessment of these reaches can be achieved with a minimum of additional effort. The design will be to combine the level 2 EDT attributes with experts in the field to subjectively assign values that will directly feed the current gaps in our EDT model as opposed to using data from an adjacent reach we know is not similar.

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 2011 or early 2012 and thereafter for each four 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 : Population Status
- * 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 : Tributary Habitat

Primary Focal Species: 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>)

Data Repositories: Okanogan Basin Monitoring & Evaluation Program (OBMEP) website

Protocol: OBMEP-habitat (2003-022-00) **Proposed Project:** **Sites for this WE:** 75



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2012	3/31/2012	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 rapid assessment data collection tools for EDT reaches not covered by random sites	3/1/2012	6/1/2012	Inactive	To complete the population of the EDT model for the Okanogan River subbasin requires some additional habitat data to be collected in EDT reaches that are not currently being monitored through OBMEP's randomized monitoring approach. Rapid assessment of these reaches can be achieved with a minimum of additional effort. The design will be to combine the level 2 EDT attributes with experts in the field to subjectively assign values that will directly feed the current gaps in our EDT model as opposed to using data from an adjacent reach we know is not similar.
C. Review, revise, and Publish protocol, study design, and methods in monitoringmethods.org	3/1/2012	6/30/2012	Inactive	The Protocol (including temporal and spatial design) and Methods for this work element are stored at monitoringmethods.org and need to be finalized (i.e., "Published" through monitoringmethods.org), preferably prior to data collection. Preparations for contract renewals must include reviewing any previously published Protocols/Methods to ensure that they are consistent with how work will be done in any subsequent contract.
D. Conduct year 1 of training and group rapid assessment calibration	6/1/2012	7/15/2012	Inactive	Training will involve providing the data collection tools to a group of local experts and assessing a few sites in order to make sure that the consensus ratings are within 1-2 tenths on the 0-4 scoring criteria used to populate the EDT model. Experts from monitoring and habitat subdivisions of the Colville Tribes, IFCI consultants, ONA biologists, and others experts knowledgeable about Okanogan River aquatic and terrestrial habitats will be involved in this training and only trained individuals will be allowed to conduct further assessments. This effort is expected to take one week and involve extensive debate in order to calibrate all data collectors and get regional buy in from local experts.
E. Physical Habitat Surveys of about 20 sites	7/1/2012	7/31/2012	Inactive	Collection of physical habitat data under pre-established regionally accepted protocols at sites 1-20
F. Conduct year 1 of rapid assessment work	7/15/2012	9/30/2012	Inactive	Conduct rapid assessments on all EDT reaches that do not contain any existing OBMEP habitat sites or EDT reaches that are poorly characterized by the randomly selected OBMEP habitat site. These sites will be revisited every 4 -years to update the EDT model prior to each subsequent model run.
G. Physical Habitat Surveys of about 20 sites	8/1/2012	8/31/2012	Inactive	Collection of physical habitat data under pre-established regionally accepted protocols at sites 21-40
H. Physical Habitat Surveys of about 10 sites	9/1/2012	10/30/2012	Inactive	Collection of physical habitat data under pre-established regionally accepted protocols at sites 41-50
I. Conduct year 2 of training and group rapid assessment calibration	6/1/2013	7/15/2013	Inactive	This effort will only occur if not all the sites can be visited in year 1. Training will involve providing the data collection tools to a group of local experts and assessing a few sites in order to make sure that the consensus ratings are within 1-2 tenths on the 0-4 scoring criteria used to populate the EDT model. Experts from monitoring and habitat subdivisions of the Colville Tribes, IFCI consultants, ONA biologists, and others experts knowledgeable about Okanogan River aquatic and terrestrial habitats will be involved in this training and only trained individuals will be allowed to conduct further assessments. This effort is expected to take one to two days and involve considerably less debate when compared to the first year of training to calibrate all data collectors and get regional buy in from local experts.
J. Physical Habitat Surveys of about 20 sites	7/1/2013	7/31/2013	Inactive	Collection of physical habitat data under pre-established regionally accepted protocols at sites 1-20
K. Conduct year 2 of rapid assessment work	7/15/2013	9/30/2013	Inactive	This work will only occur is not all sites where visited in year 1. Conduct rapid assessments on all EDT reaches that do not contain any existing OBMEP habitat sites or EDT reaches that are poorly characterized by the randomly selected OBMEP habitat site. These sites will be revisited every 4-years to update the EDT model prior to each subsequent model run.
L. Physical Habitat Surveys of about 20 sites	8/1/2013	8/31/2013	Inactive	Collection of physical habitat data under pre-established regionally accepted protocols at sites 21-40
M. Physical Habitat Surveys of about 10 sites	9/1/2013	10/30/2013	Inactive	Collection of physical habitat data under pre-established regionally accepted protocols at sites 41-50
Deliverable: N. Physical habitat data from 50 sites		2/28/2014	Inactive	<i>See the Deliverable Specification above</i>

H: 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. OBMEP will collect weekly data on stage height at Tonasket, Johnson and Antoine Creeks and calculate discharge using established WDOE stage discharge curves. USGS collects real-time discharge at several locations along the mainstem Okanogan River and through cooperative agreements the Colville Tribes will expand the USGS effort to include real-time water temperature at all USGS gauging sites and both discharge and temperature on Nine-mile Creek. Temperature data loggers will be deployed and retrieved from 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, conductivity, and alkalinity are collected in addition to temperature and discharge or stage 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. To meet the above requirement piezometers that can detect pressure will be used to establish stage data at all subwatershed where anadromous exist but discharge is not currently being collected and a temperature data logger will be placed at these same sites thus linking discharge and temperature data.

Deliverable Specification: Estimated level of effort: 1.87 FTEs/year
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 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 2012 or early 2013 with a web accessible reporting tool being created to serve up these data beginning prior to 2018. 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, at stage monitoring sties, and at USGS sites along the Okanogan River main-stem. Beginning in October, data loggers will be moved to the next year's rotating panel sites. Data loggers will be monitored and downloaded 3-times per year (After winter ice is gone, after the spring freshet, and at the end of the water year. 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 : Uncertainties Research

Primary Focal Species: 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>)

Data Repositories: Okanogan Basin Monitoring & Evaluation Program (OBMEP) website

Protocol: OBMEP-habitat (2003-022-00) **Proposed Project:** **Sites for this WE:** 26



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2012	3/31/2012	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. Review, revise, and Publish protocol, study design, and methods in monitoringmethods.org	3/1/2012	3/31/2013	Inactive	The Protocol (including temporal and spatial design) and Methods for this work element are stored at monitoringmethods.org and need to be finalized (i.e., "Published" through monitoringmethods.org), preferably prior to data collection. Preparations for contract renewals must include reviewing any previously published Protocols/Methods to ensure that they are consistent with how work will be done in any subsequent contract.
C. Develop agreements with Environment Canada and USGS to operate and maintain gauging stations	3/1/2012	6/28/2012	Inactive	Develop the contract or agreements to operate, maintain, and post water quality gauging data for both temperature and discharge in the Okanogan drainage.
D. Collect and post data collected at WDOE, Environment Canada and USGS gauging stations	3/1/2012	2/28/2013	Inactive	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.
E. Collect data, and calculate discharge at Antoine, Tonasket, and Johnson Creeks	3/1/2012	2/28/2014	Inactive	The Colville Tribes have taken over data collection efforts at historic WDOE discharge sites in Tonasket, Antoine, and Johnson Creek subwatersheds within the Okanogan River basin that would have otherwise been abandoned due to budget cuts. The Colville Tribes will collect stage readings and calculate discharge based on the established WDOE stage discharge relationship.
F. Ensure that each anadromous fish bearing subwatershed has baseline stage and temperature data	3/1/2012	2/28/2014	Inactive	Continuous baseline stage height and temperature sites along with water quality data (collected on average once every 6 weeks) related to Alkalinity, turbidity, conductivity, Ph, and dissolved oxygen will be collected at least one site per anadromous fish bearing subwatershed throughout the Okanogan River basin.
G. Download temperature data collected from deployment to spring thaw	3/1/2012	4/30/2012	Inactive	Data will be downloaded from electronic data logger After ice is completely gone in the spring to protect against data lost from equipment malfunction or loss.
H. Download temperature data after discharge returns to post freshet levels	5/1/2012	8/30/2012	Inactive	Data will be downloaded from electronic data logger after spring freshet discharges approximates return to a typical low flow pattern.
I. Deploy, Download, and calibrate temperature data loggers	9/1/2012	10/31/2012	Inactive	Data will be downloaded from electronic data logger at the end of each water year and loggers will be tested for accuracy before being redeployed at new panel sites or for another year at continuous sites.
J. Develop agreements with Environment Canada and USGS to operate and maintain gauging stat	3/1/2013	6/28/2013	Inactive	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 collected from deployment to spring thaw	2/1/2013	4/30/2013	Inactive	Data will be downloaded from electronic data logger After ice is completely gone in the spring to protect against data lost from equipment malfunction or loss.
L. Download temperature data after discharge returns to post freshet levels	5/1/2013	8/30/2013	Inactive	Data will be downloaded from electronic data logger after spring freshet discharges approximates return to a typical low flow pattern.
M. Deploy, Download, and calibrate temperature data loggers	9/1/2013	10/31/2013	Inactive	Data will be downloaded from electronic data logger at the end of each water year and loggers will be tested for accuracy before being redeployed at new panel sites or for another year at continuous sites.
Deliverable: N. Water quality and quantity data		2/28/2014	Inactive	<i>See the Deliverable Specification above</i>

I: 119. Manage and Administer Projects

Title: Manage Projects: produce necessary documents, estimates, and personnel management



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, development of reporting documents such as invoices, budgets, SOW documents, office space expenses, and and O&M of facilities and equipment is also included to cover the needs of this project and the people that it supports. Their are also costs related to utilities and communications essential to the needs of this project.

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	3/1/2012	2/28/2014	Inactive	Administrative and clerical support for this project.
B. Accrual - Submit September estimate to BPA	8/20/2012	9/10/2012	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. Accrual - Submit September estimate to BPA	8/20/2013	9/10/2013	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.
D. Provide BPA with 2013 -2014 SOW, budget, etc.	9/15/2013	10/1/2013	Inactive	150 days in advance of contract end date.
Deliverable: E. A properly administered project and other deliverables as stipulated by BPA		2/28/2014	Inactive	<i>See the Deliverable Specification above</i>

J: 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 through 2011 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	3/1/2012	2/28/2014	Inactive	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 2012	3/1/2012	6/30/2012	Inactive	Contact private landowners to secure or maintain permission for EMAP sampling sites.
C. Contact landowners for rotating panel to be sampled in 2013	3/1/2013	6/30/2013	Inactive	Contact private landowners to secure or maintain permission for EMAP sampling sites.
Deliverable: D. Coordination efforts will be described in the Annual Report		2/28/2014	Inactive	<i>See the Deliverable Specification above</i>

K: 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 summarized 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

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Develop content, post data, and reports on OBMEP web-site	3/1/2012	2/28/2014	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	3/1/2012	2/28/2014	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. Attend and present information at other meetings as requested.
C. Attend practitioner's workshops for PNAMP and other PNAMP meetings	3/1/2012	2/28/2014	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: D. Presentations at conferences, updated OBMEP website		2/28/2014	Inactive	<i>See the Deliverable Specification above</i>

L: 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.

From 2005-2010, we have been building a tool that has served to mainly archive our existing data. Beginning in 2011 we began to move the database to the forefront of our monitoring efforts. As the data system evolves we hope that users can spend more time conducting analysis and spend less time collecting and managing these data. In the future, we hope these tools will have evolved to the point of greatly eliminating the need for paper reports by providing web accessible reporting tools.

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, constructing software solutions, and database development; the Colville Tribes are responsible for data inclusion from data collection work elements for this work element and needed data reporting and analysis.

Estimated Level of Effort: 0.55 FTEs/year with considerable subcontracting effort.

Deliverable Specification:

Input and manipulation of OBMEP data from 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, and 2013 field collection and critical historical data from other sources 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 web accessible reporting tools and security interfaces will help to fulfill technical reporting needs into the future.

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.

Data Repositories:

Okanogan Basin Monitoring & Evaluation Program (OBMEP) website

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Training and support	3/1/2012	2/28/2014	Inactive	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	3/1/2012	2/28/2014	Inactive	Databases are not simply created they evolve and over time we need to adjust and change our database to meet constantly changing needs. During 2012 and 2013 this work will primarily focus on building a dashboard interface to improve ease of navigation and security of the OBMEP database.
C. Develop customized output routines	3/1/2012	2/28/2014	Inactive	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. During 2012 and 2013, we will begin building a dynamic reporting tool to improve access of our data to more people.
D. Audit existing data contain within the OBMEP database	12/1/2012	12/31/2012	Inactive	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	12/1/2013	12/31/2013	Inactive	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	3/1/2012	2/28/2014	Inactive	Data assimilation for multiple sources requires ongoing effort to input both present and historical information and ensure that it meets our quality standards.
Deliverable: G. Input of this years data, plus modification and auditing of our existing database architecture		2/28/2014	Inactive	<i>See the Deliverable Specification above</i>

M: 162. Analyze/Interpret Data

Title: Analyze collected and historical data



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 various technical reports written as time and resources allow. Automation work on database functions will be coupled to analytical routines wherever possible in order to minimize calculation errors and increase efficiencies when calculating repetitive values.

Habitat data will be analyzed collectively using the EDT model to incorporate multivariate data analysis into our reporting structure every 4 years or more often if needed to inform management needs such as the Biop or expert panel process. In addition important individual indicators will be analyzed when they are considered locally important. 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, 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 worst 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.

Adult abundance data are collected from the multiple sources using multiple methods. Once collected these data must be combined with additional biological data to calculate total escapement into each subwatershed, origin portions, distribution, run timing, and cohort strength and how each of these change over time. These data will also be used to compare with adult PIT tag return data collected throughout the basin to determine if PIT tagged adults represent a comparably accurate and less expensive approach to determining abundance, origin, sex ratio, and cohort age at the subwatershed scale.

Data analysis frameworks for evaluating juvenile production estimates are currently under consideration. Most of these data will be collected using standing crop methods while inserting PIT tags into these fish for estimations of emigration upon subsequent recaptures. Various data analysis approaches will be considered as these data are collected and results can begin to be evaluated.

Estimated Level of Effort: 0.29 FTEs

Deliverable Specification:

Synthesize collected data for inclusion in future technical reports or manuscripts.

Planned Metrics:

- * Primary R, M, and E Focal Area : Population Status
- * 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 : Tributary Habitat

Primary Focal Species:

Steelhead - Upper Columbia River DPS

Country:

NPCC Subbasin:

State:

HUC5 Watershed:

County:

HUC6 Name:

Salmonid ESUs Present:

Data Repositories:

Okanogan Basin Monitoring & Evaluation Program (OBMEP) website

Protocol:

OBMEP-habitat (2003-022-00)

Proposed Project:

Sites for this WE:

0

Area of Inference:

Name	Value
Steelhead Summer-Winter	Okanogan River
Interior Columbia Pop.	
Bound	



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Analyze habitat monitoring data using EDT for the period from 2005-2009	3/1/2012	2/28/2013	Inactive	Habitat data collected from the Okanogan basin will be analyzed through the Ecosystem Diagnostic and Treatment (EDT) model. The EDT model provides a means to examine potential salmonid productivity and capacity of a given system. Analysis is made at different scales, from reach, to tributary and total watershed. With multiple years of data collected at annual and panel habitat sites, we are able to examine changes in habitat and examine which factors are limiting recovery of salmonids at specific life stages. Following the model run, a technical report will be completed in early 2012 and thereafter for each four years of data using EDT models to synthesize these data. Once finalized these technical reports will be posted to BPA and OBMEP web sites.
B. Analyze data on returning adult steelhead 2012	6/1/2012	2/28/2013	Inactive	Data taken from underwater video stations, redd surveys, PIT tag detections, and weir traps will be analyzed in conjunction to create a yearly (2012) steelhead escapement estimation for the basin as a whole. Individual sub-watersheds within the Okanogan basin will be analyzed independently, where appropriate data exists to do so. After the data has been analyzed, it will be compiled into a escapement and spawning distribution report as well as included in the progress (annual) report. The data is kept in a multi-year excel spreadsheet for continuing analysis dating back to 2005.
C. Analyze data on returning adult steelhead 2013	6/1/2013	2/28/2014	Inactive	Data taken from underwater video stations, redd surveys, PIT tag detections, and weir traps will be analyzed in conjunction to create a yearly (2013) steelhead escapement estimation for the basin as a whole. Individual sub-watersheds within the Okanogan basin will be analyzed independently, where appropriate data exists to do so. After the data has been analyzed, it will be compiled into a escapement and spawning distribution report as well as included in the progress (annual) report. The data is kept in a multi-year excel spreadsheet for continuing analysis dating back to 2005.
D. Analyze water quality data 2012	3/1/2012	2/28/2013	Inactive	We gather data on water quality, quantity, and temperature. Water quality data is collected once monthly, quantity data is collected a realtime stations and hand measurements, and temperature data is recorded hourly at all tributary habitat sites. After QAQC, the data is uploaded to the OBMEP database. We will then synthesize/summarize our collected data along with data gathered by other agencies into usable summary tables and graphs. Water quality data is also incorporated into the EDT model. We will work to analyze, interpret, and test our data in easily understood ways that provide rapid assimilation of complex and often complicated evaluations so 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. Changes in the OBMEP data collect effort that result will be documented in our SOW and our protocols (tracked using monitoringmethods.org). These data will be compiled based upon the previous 2006 water quality report.
E. Compile all summer steelhead data collected from 2005-2010 into a single report	3/1/2012	8/1/2012	Inactive	Annual reports are compiled for adult abundance and over time methods change and adjustments are made to the program requiring periodic restating of information to make these data comparable. We will compile all data collected between 2005 and 2010 and compare and contrast these data over this time period.
F. Look into data analysis technics for analyzing PIT tag data from both Juvniles and adults	3/1/2013	2/28/2014	Inactive	Evaluate multiple techniques for evaluation of PIT tag data.
G. Review, revise, and Publish protocol, study design, and methods in monitoringmethods.org	3/1/2012	2/28/2014	Inactive	The Protocol (including temporal and spatial design) and Methods for this work element are stored at monitoringmethods.org and need to be finalized (i.e., "Published" through monitoringmethods.org), preferably prior to data collection. Preparations for contract renewals must include reviewing any previously published Protocols/Methods to ensure that they are consistent with how work will be done in any subsequent contract.
Deliverable: H. Summaries of collected data		2/28/2014	Inactive	<i>See the Deliverable Specification above</i>

N: 141. Produce Other Report

Title: Produce technical reports



Description:

The data collected by this project are placed in a data base and made public to other users upon request. However, most people find technical reports that summarize and interpret these data to be of more use than the raw data. Therefore, taking the time to compile and write reports of use to management agencies is a natural product of data collection. With our reports we hope to help inform Both biologists and policy professionals involve with salmon mitigation, restoration, and recovery. To that end we will produce reports designed to help inform the federal Biop for the Columbia River and more specifically the Upper Columbia Summer steelhead ESU related to BiOP reporting and the "expert panel process".

Our report will also focus on informing local agencies involve with implementation of salmon recovery and habitat restoration actions specifically in the Okanogan River subbasin. We will attempt to help inform agencies as to what limiting factors to address for each life stage and where to locate these actions. Our data will also be useful in evaluating or prioritizing these actions and provide retrospective information linking locations where habitat changes occur with in fish population data.

Deliverable Specification:

In FY2012 we plan to work on completing the the following reports;

2012 Annual Summer steelhead adult abundance report

A summary report of summer steelhead adult abundance information for the period from 2005 through 2010.

The Okanogan Basin summer steelhead EDT habitat report for the period from 2005 through 2009.

Other report may be produced as time and resources allow.

In FY2013 we plan to work on completing the the following reports;

2013 Annual Summer steelhead adult abundance report

The Okanogan Basin water quality report for the period from 2005 through 2011.

Other report may be produced as time and resources allow.

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Okanogan Basin EDT habitat status and trend report 2005-2009	3/1/2012	6/30/2012	Inactive	This report is the culmination of several years of intensive testing, planning , data collection, and reporting tool development. This report will set the baseline upon which future trend analysis will be based and changes in habitat condition will be evaluated in the Okanogan River basin.
B. Adult steelhead retrospective report 2005-2010	3/1/2012	7/1/2012	Inactive	Annual status report data will be standardized and reported for all subwatershed within the Okanogan River basin to take a retrospective look at recovery or degradation.
C. Annual steelhead escapement and spawning distribution report 2012	6/1/2012	2/28/2013	Inactive	This report will contain summary data from the current year's (2012) steelhead escapement numbers as well as trend analysis back to 2005. Incorporated into this document will be underwater video observations, steelhead spawning surveys, PIT tag detections, and adult weir trap data. The final report will be uploaded to the OBMEP and BPA websites. It will also be included in the progress (annual) report.
D. Okanogan Basin Water Quality and Quantity Report 2005-2011	3/1/2013	2/28/2014	Inactive	Measures of water quality and water quantity will be examined for the Okanogan River basin and related to how the measures apply to salmon and steelhead.
E. Annual Steelhead escapement and spawning distribution report 2013	6/1/2012	2/28/2014	Inactive	This report will contain summary data from the current year's (2013) steelhead escapement numbers as well as trend analysis back to 2005. Incorporated into this document will be underwater video observations, steelhead spawning surveys, PIT tag detections, and adult weir trap data. The final report will be uploaded to the OBMEP and BPA websites. It will also be included in the progress (annual) report.
F. Other reports	3/1/2012	2/28/2014	Inactive	As time and resources allow we will work to produce other technical reports related to such topics as steelhead juvenile standing crop or productivity. Benthic Macro Invertebrate, composition and densities, or other topics of interest supported by the data collected under this project.
Deliverable: G. Reports planned to be completed during this contract period.		2/28/2014	Inactive	<i>See the Deliverable Specification above</i>

O: 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 latter than July of the the year following when the data were collected. Additional staff time is included to help produce technical reports and writing support.

Estimated Level of Effort: 0.35 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.

Planned Metrics:

* Start date of reporting period : 3/1/2011

* End date of reporting period : 2/28/2013

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Submit report for external and COTR review	6/1/2012	8/31/2012	Inactive	Submit annual report for peer and COTR review
B. Finalize Annual Report	7/1/2012	7/31/2012	Inactive	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	8/1/2012	8/31/2012	Inactive	Upload report
D. Submit progress report for external review and COTR review	6/1/2013	6/30/2013	Inactive	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	7/1/2013	7/31/2013	Inactive	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	8/1/2013	8/31/2013	Inactive	Upload report
Deliverable: G. Submit Final 2011 and 2012 Annual Reports to BPA COTR for posting		8/31/2013	Inactive	<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>