



## Statement of Work Report

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**Project Title:** Okanogan Basin Monitoring & Evaluation Program (OBMEP)  
**Project #:** 2003-022-00  
**Contract Title:** 2003-022-00 EXP MONITOR/EVAL OKANOGAN BASIN PROGRAM  
**Contract #:** 71571 [ISSUED]  
**Province:** Columbia Cascade      **Subbasin:** Okanogan  
**Workorder ID:** 188017      **Task ID:** 1  
**Perf. Period Budget:** \$2,825,166      **Perf. Period:** 3/1/2016 - 2/28/2018  
**Contract Type:** Contract (IGC)      **Pricing Type:** Cost Reimbursement (CNF)  
**Contractor(s):** Colville Confederated Tribes (Prime - COLVILLE00)  
**BPA Internal Ref:** 71571  
**SOW Validation:** Last validated 12/07/2015 with 0 problems, and 5 reviewable items

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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		\$7,383	(0 %)
B : 165. Produce Environmental Compliance Documentation - Environmental Compliance		\$18,613	(1 %)
C : 156. Develop RM&E Methods and Designs - Publish OBMEP protocols as needed	*	\$40,585	(1 %)
D : 157. Collect/Generate/Validate Field and Lab Data - Juvenile steelhead population estimates, fish densities, and watershed health indicators.	*	\$298,381	(11 %)
E : 157. Collect/Generate/Validate Field and Lab Data - Enumerate adult returns to the Okanogan River basin	*	\$352,740	(12 %)
F : 157. Collect/Generate/Validate Field and Lab Data - Monitor threats to salmonid habitats	*	\$566,329	(20 %)
G : 157. Collect/Generate/Validate Field and Lab Data - Water temperature and discharge monitoring data collection	*	\$332,647	(12 %)
H : 119. Manage and Administer Projects - Manage Projects: produce necessary documents, estimates, and personnel management		\$172,867	(6 %)
I : 191. Watershed Coordination - Project coordination/public outreach		\$120,497	(4 %)
J : 160. Create/Manage/Maintain Database - Manage, maintain, and expand the OBMEP database		\$280,164	(10 %)
K : 162. Analyze/Interpret Data - Analyze collected and historical data		\$461,595	(16 %)
L : 132. Produce (Annual) Progress Report - PLACEHOLDER:Submit Progress Report for the period 1/1/15 to 12/31/15		\$0	(0%)
M : 132. Produce (Annual) Progress Report - Produce annual progress report for 1/1/2016 - 12/31/2016		\$38,774	(1 %)
N : 132. Produce (Annual) Progress Report - Produce annual progress report for 1/1/2017 - 12/31/2017		\$39,699	(1 %)
O : 202. Produce BiOp RPA Report - BiOp RPA Report for CY 2016		\$47,446	(2 %)
P : 202. Produce BiOp RPA Report - BiOp RPA Report for CY 2017		\$47,446	(2 %)
<b>Total:</b>		<b>\$2,825,166</b>	

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

**Contract Description:**

**Project goal:**

Monitoring and Evaluation of summer steelhead and their habitats at a sub-basin scale requires a long-term commitment as most outcomes will not be realized for 7 to 20+ years. The first 7 years of this project (prior to 2011) were used to establish the program and all its elements, and establish a baseline to compare with future data collection. This project is designed to ultimately achieve the following goals:



1. Determine if there is a meaningful biological change at the population scale for summer steelhead in the Okanogan basin (7-20+ year time frame).
2. Determine if there is a meaningful change in selected physical salmonid habitat parameters over time (12-20+ year time frame).
3. Determine if change is occurring in VSP parameters from the cumulative habitat restoration actions occurring throughout the Okanogan basin (12-20+ year time frame).
4. Establish quantitative data where little existed and fill data gaps necessary to recovery of listed salmonid species (1-20+ 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 2016 and 2017:

Continued implementation of existing standardized OBMEP protocols with adjustment made to improve analytical and reporting tools. In the first phase, 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 could be based. In 2013 we completed our second round of data collection and began focusing more closely on creating useful information out of the data collected. As we transition into our third round of data collection we are focused on how best to feed our models and reporting platforms and development of trend analysis with an eye toward gaining efficiencies or improving data quality. Application of our results and enhancement of understanding specific to summer steelhead populations and habitat within the Okanogan River Basin will help evaluate 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 OBMEP is well positioned to document the changes in habitat resulting from catastrophic wildfires that have hit the Okanogan River Basin in the last 2 years.

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 guidelines 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 stakeholders 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 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 and 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 populations; and (iii) by supporting the planning, development and implementation of management actions indirectly impacting salmonid populations.

In 2011, the CHaMP monitoring program was given policy guidance related specifically to the needs of the habitat status and trend monitoring program operating within the Columbia River Basin by the directors of BPA, NPCC, NOAA, USFS, USFWS, and USBOR. Collectively, they wanted habitat monitoring programs to provide usable information that helps feed: 1) the Endangered Species Act Viable Salmonid Population criteria, 2) Expert panel process for crediting, 3) Timely fisheries management and adaptive management, 4) A mechanism for project selection, 5) updated limiting factors including a way to prioritize restoration actions and areas, and 6) a mechanism for evaluating habitat restoration actions in terms of status, trend, and effectiveness. Much of our work over the last 3 to 4 years has focused on development of habitat reporting tools that we believe meet all of the objectives outlined by the policy director and by the end of this contract period we will have reports that compile all our habitat data through 2013 into this new format.

#### Sampling Design:

The Colville Tribes have used, extended and modified the structure and methods employed by the Integrated Status and Effectiveness Monitoring Program (ISEMP), Columbia Habitat Monitoring Program (CHaMP), and the Monitoring Strategy for the Upper Columbia Basin (Hillman 2004) for use in the OBMEP program. OBMEP is aligned tightly with the priorities expressed in documents and guidelines 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 as adapted from Hillman (2004), we implemented and modified 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. The 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 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. After the first 5 years and statistical analysis conducted on data collected from the Wenatchee ISEMP, a series of modifications and changes to the original design were suggested and at the same time the Columbia Habitat Monitoring Program (CHaMP) was born to replace the Wenatchee ISEMP effort. From the ISEMP 2010 findings we adjusted our site selection in the Okanogan River basin to a 4-year rotating panel design and included stratification for EDT stream reach (hydrologic, biologic, and modeling stream reach breaks) with a filter designed to eliminate replication within a given stream reach. We had a small number of additional sites to add to our sampling universe as a result of applying these rules and selected to locate these new sites at or near the mid point of the longest remaining EDT reaches that were not previously monitored, with a net reduction from 150 sites to 125 sites that are sampled within a given panel rotation. A map of these sites and the hierarchical structure of EDT reaches and diagnostic units that make up the Okanogan River Subbasin can be obtained on 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 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. The EDT reporting tools have been completely redesigned for this effort to address policy guidance provided by BPA, NPCC, NOAA, USFS, USFWS, and USBOR whom want habitat monitoring effort to effectively feed: 1) the Endangered Species Act Viable Salmonid Population criteria, 2) Expert panel process for crediting 3) provide useful and timely information for fisheries management and adaptive management, 4) provide a mechanism for project selection, 5) provide information in limiting factors and a way to prioritize restoration actions and areas, and 6) provide an evaluation of habitat status and trend plus project effectiveness.

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 will begin in 2014 but OBMEP will play only a minor roll in helping the region close this gap with additional support channeled through the coordinated assessment project and stream-net. Through these collaborative and coordinated efforts OBMEP data will become more available for use by BPA, NPCC, PNAMP, and other established regional 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.

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. 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 effort 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, ASMS 2010, Crawford and Rumsey 2011). In addition, the Biological Opinion on the Federal Columbia River Power System requires the development and implementation of a coordinated monitoring and evaluation program (NOAA Fisheries 2008). The call for developing a consistent, region-wide monitoring program has been strong and widespread. 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 TRTs who identified the Okanogan River basin as having the highest extinction risk and the largest survival gap within the Upper Columbia steelhead ESU (NOAA Fisheries 2008). 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 and OBMEP is specifically called for to contribute steelhead information for the Okanogan River population for RPA 50.4 (Crawford and Rumsey 2011). This work will help to address actions outlined in the NOAA fisheries 2008 Biological Opinion for the the Federal Columbia River Power System (RPA's 50.4, 50.6, 56.1, 56.3, 71.4, 72.1), specifically fish population and habitat status monitoring for listed Summer steelhead 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 quarterly. 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: 0.01 FTEs/year.

**Deliverable Specification:**

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Mar-Jun 2016 (3/1/2016 - 6/30/2016)	7/1/2016	7/15/2016	Active	
B. Jul-Sep 2016 (7/1/2016 - 9/30/2016)	10/1/2016	10/15/2016	Active	
C. Oct-Dec 2016 (10/1/2016 - 12/31/2016)	1/1/2017	1/15/2017	Active	
D. Jan-Mar 2017 (1/1/2017 - 3/31/2017)	4/1/2017	4/15/2017	Active	
E. Apr-Jun 2017 (4/1/2017 - 6/30/2017)	7/1/2017	7/15/2017	Active	
F. Jul-Sep 2017 (7/1/2017 - 9/30/2017)	10/1/2017	10/15/2017	Active	
G. Oct-Dec 2017 (10/1/2017 - 12/31/2017)	1/1/2018	1/15/2018	Active	
H. Final Jan-Feb 2018 (1/1/2018 - 2/28/2018)	2/14/2018	2/28/2018	Active	

#### **B: 165. Produce Environmental Compliance Documentation**



<b>Title:</b>	Environmental Compliance
<b>Description:</b>	Develop and submit permit applications for electro-fishing and PIT-tagging, plus the installation of monitoring devices (i.e., fish guidance structures, video counting stations, stream gauging stations, and PIT tag arrays). 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: 0.07 FTEs/year.
<b>Deliverable Specification:</b>	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.
<b>Planned Metrics:</b>	* 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. Obtain BPA's EC Lead sign-off that EC requirements are complete	3/1/2016	3/2/2016	Active	The EC column on the contract SOW tab in Pisces must have a "full moon" for each work element requiring environmental compliance before ground-disturbing implementation of that work element can begin. You will receive verbal or email notification from the EC Lead when a work element or, in rare instances, a portion of a work element is approved for implementation.
B. Determine if contract work could adversely affect Pacific lamprey	3/1/2016	3/2/2016	Canceled	
C. Report lamprey observation and catch data to USFWS by Feb. 15	2/1/2018	2/15/2018	Active	All contractors doing instream work (e.g., surveys, habitat improvements, electrofishing, screwtraps, etc.) in anadromous fish areas are required to annually report lamprey observations or catch, including zero, by Feb 15 for the previous calendar year's work. A data template is available at: ( <a href="http://efw.bpa.gov/contractors/docs/Lamprey_Database_Template.xls">http://efw.bpa.gov/contractors/docs/Lamprey_Database_Template.xls</a> ) As per instructions on the form, email your data to <a href="mailto:christina_wang@fws.gov">christina_wang@fws.gov</a> at US Fish and Wildlife Service and CC your COTR. For identification of lamprey life stages see page 10 of USFWS Best Management Practices to Minimize Adverse Effects to Pacific Lamprey ( <i>Entosphenus tridentatus</i> ) <a href="http://www.fws.gov/pacific/Fisheries/sphabcon/lamprey/pdf/Best%20Management%20Practices%20for%20Pacific%20Lamprey%20April%202010%20Version.pdf">http://www.fws.gov/pacific/Fisheries/sphabcon/lamprey/pdf/Best%20Management%20Practices%20for%20Pacific%20Lamprey%20April%202010%20Version.pdf</a> .
D. Inspect water craft, waders, boots, etc. to be used in or near water for aquatic invasive species	3/1/2016	2/28/2018	Active	Aquatic Invasive Species Guidance: Uniform Decontamination Procedures: <a href="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">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</a> -- Best management guidance for boaters: <a href="http://www.coastal.ca.gov/ccbn/bmp-boaters.pdf">http://www.coastal.ca.gov/ccbn/bmp-boaters.pdf</a> -- Aquatic Nuisance Species newsletter: <a href="http://www.aquaticnuisance.org/newsletters">http://www.aquaticnuisance.org/newsletters</a> -- State Aquatic Invasive Species Management Plans: Washington: <a href="http://www.wdfw.wa.gov/publications/pub.php?id=00105">http://www.wdfw.wa.gov/publications/pub.php?id=00105</a>
E. Inspect and, if necessary, wash vehicles and equipment infested with terrestrial invasive species	3/1/2016	2/28/2018	Active	Prevent spread of invasive species
F. Participate in ESA Consultation	3/1/2016	2/28/2018	Active	
G. Provide information for Section 106 Cultural review	3/1/2016	3/2/2016	Canceled	
H. Plan for field inventory	3/1/2016	3/2/2016	Canceled	
I. Cultural resource surveys	3/1/2016	3/2/2016	Canceled	
J. Obtain/Renew applicable local, state, federal and tribal environmental permits	3/1/2016	2/28/2018	Active	Work done to obtain permits such as Sec. 401 or 404 (including RGP process), shoreline, NPDES, or any other required federal, state, or local permits.
<b>Deliverable: K. Applicable permits and other environmental clearances received</b>		2/28/2018	Active	<i>See the Deliverable Specification above</i>

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

Title: Publish 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, and intellectual changes, protocols need to be periodically updated, revised or created. OBMEP protocols and methods have been entered into monitoringmethods.org. However, ongoing changes, consolidation and revisions will be necessary to implement this program going forward. Over the last year, considerable progress has been made to consolidate, revise and publish our protocols used for OBMEP with an expectation that these revisions will remain static for a period of at least 4 years once completed. This process will continue until protocols 5,6,7,8,9,192 and 194 are published in monitoringmethods.org. New protocols and methods may need to be added as changes to the program are implemented.

Level of Effort: 0.13 FTEs/year.

**Deliverable Specification:** Published 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:** Okanogan Basin Monitoring & Evaluation Program - Adult Abundance - Redd Surveys v1.0

**Protocol Owner:** John Arterburn **Protocol State:** Draft

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2016	3/2/2016	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	3/1/2016	2/28/2018	Active	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.
<b>Deliverable: C. Published protocols</b>		2/28/2018	Active	<i>See the Deliverable Specification above</i>

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

**Title:** Juvenile steelhead population estimates, fish densities, and watershed health indicators.

**Description:** The intent of OBMEP's juvenile abundance protocol is to estimate the abundance, species, and density of fish observed at sites located within the Okanogan River Basin. Juvenile salmonid data is gathered using snorkel surveys, mark-recapture electrofishing, PIT tag data and rotary screw trap data. The relative abundance of juvenile summer steelhead at EMAP sites located in the United States and Canada is determined using snorkeling surveys that follow established OBMEP protocols (monitoring methods ID#'s 7). These methods are consistent and in wide spread use throughout the Columbia River Basin and all data will be shared. Regional use of these data are the primary purpose for continued collection of these data.

For making informed management decisions in the Okanogan River Basin more precise population estimates are calculated using electrofishing mark/recapture methods (monitoring methods ID#194) and these methods also allow for the deployment of PIT-tags into natural origin steelhead. We have tested this approach for several years and found it to be both highly precise and more informative than snorkel surveys. These data also allow us to assess utilization of tributaries to the Okanogan River by juvenile steelhead and to determine population estimates and emigration rates from streams, while conforming to existing monitoring frameworks in the basin. Population estimates will be used to calibrate habitat modeling outputs from the EDT model. These methods will be extended to sites in Canada for the first time.

Sub-contract with ONA for sites in Canada

Estimated Level of Effort: 0.93 FTEs/year.

**Deliverable Specification:** Snorkel counts provide an indicator of relative abundance, distribution, and size of juvenile summer steelhead throughout the Okanogan River Basin. A more statistically robust analysis can be developed using electrofishing and mark recapture methods. Yearly, juvenile fish will be summarized into the annual report and archived into the OBMEP database.



**Planned Metrics:** \* Primary R, M, and E Focal Strategy : Population Status  
 \* Primary R, M, and E Type : Status and Trend Monitoring  
 \* Secondary R, M, and E Type : Action Effectiveness Monitoring  
 \* Secondary R, M, and E Focal Strategy : Tributary Habitat

**Locations:** 50

**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 ([http://www.colvilletribes.com/obmep\\_project\\_data.php](http://www.colvilletribes.com/obmep_project_data.php)) & Evaluation Program (OBMEP) website

**Protocol:** Okanogan Basin Monitoring & Evaluation Program - Juvenile Abundance - Mark-Recapture v1.0

**Protocol Owner:** John Arterburn **Protocol State:** Draft

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2016	3/2/2016	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	3/1/2016	2/28/2018	Active	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. This work is conducted for all OBMEP protocols under WE C.
C. Mobilize equipment, and training	3/1/2016	7/15/2016	Active	Purchase, prepare equipment, and train field staff on specific protocol applications
D. Snorkeling all EMAP sites	7/18/2016	10/31/2016	Active	Snorkeling at 50 EMAP sites (25 annual, 25 rotating panel) looking for adult and juvenile anadromous fish.
E. Conduct electrofishing	7/15/2016	10/31/2016	Active	Conduct mark recapture at tributaries to the Okanogan River as time and resources allow.
F. QA/QC data and enter into the OBMEP database	7/15/2016	2/28/2017	Active	Enter data into the OBMEP database and apply appropriate QA/QC routines.
G. Demobilize, repair, and securely store equipment	11/1/2016	2/28/2017	Active	Demobilize, repair, and store sampling equipment.
H. Mobilize equipment, and training	3/1/2017	7/15/2017	Active	Purchase, prepare equipment, and train field staff on specific protocol applications
I. Snorkeling all EMAP sites	7/15/2017	10/31/2017	Active	Snorkeling at 50 EMAP sites (25 annual, 25 rotating panel) looking for adult and juvenile anadromous fish.
J. Conduct electrofishing	7/15/2017	10/31/2017	Active	Conduct mark recapture at tributaries to the Okanogan River as time and resources allow.
K. QA/QC data and enter into the OBMEP database	7/15/2017	2/28/2018	Active	Enter data into the OBMEP database and apply appropriate QA/QC routines.
L. Demobilize, repair, and securely store equipment	10/1/2017	2/28/2018	Active	Demobilize, repair, and store sampling equipment.
<b>Deliverable: M. Juvenile steelhead population estimates, fish densities, and natural origin migration timing.</b>		2/28/2018	Active	<i>See the Deliverable Specification above</i>

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

**Title:** Enumerate adult returns to the Okanogan River basin



**Description:** 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 estimates to be calculated required considerable additional data collection. To fill these gaps, 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 are able to determine annually the number of summer steelhead spawners entering each subwatershed, origin, and their spatial distribution. Annual adult summer steelhead spawner abundance estimates are compiled along with information related to origin and spatial structure through four specific activities: 1) video data will only be collected during the fall months at Zosel Dam in collaboration with Chief Joe Monitoring, 2) picket weir data collected under contract with Grant PUD in Omak under hatchery broodstock collection efforts will be shared. 3) summer steelhead redd surveys conducted in all remaining areas, and 4) PIT-tag data incorporated where possible as antenna arrays are installed under this project in conjunction with project # 201003400, although PIT-tag antenna array O&M will be funded outside of this specific project. Our evaluation efforts suggest that PIT-tag data represent the best single approach for enumerating adult steelhead spawner returns but that redd surveys represent the best method for collecting distribution, range extent, and spatial structure. Expanding PIT-tag technology into Canada began in 2014 and will continue to be expanded as time, and resources allow.

Estimated Level of Effort: 1.23 FTEs /year.

Subcontract with ONA for PIT-tag array installation and maintenance in Canada.

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

- 1) Fall data collected at video counting station located at Zosel Dam primarily for Chinook and sockeye.
- 2) Summer steelhead redd surveys conducted throughout the United States portion of the watershed to evaluation distribution, range and spatial structure.
- 3) PIT-tag data collected at multiple sites in both the US and Canada will be used to enumerate summer steelhead spawner returns.

Numeric data related but not limited to species, origin, sex, marks, tags, and age will be collected opportunistically and archived on the OBMEP server. These data will be compiled with additional data collected under different projects and work elements to produce an annual spring spawner report and annual population estimates for summer steelhead.

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

**Locations:** 28

**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 (<multiple>) | Outside legal STUCR (Upper Columbia River Steelhead DPS) boundary (<multiple>) | Upper Columbia River Steelhead DPS (<multiple>)

**Data Repositories:** Okanogan Basin Monitoring ([http://www.colvilletribes.com/obmep\\_project\\_data.php](http://www.colvilletribes.com/obmep_project_data.php)) & Evaluation Program (OBMEP) website

**Protocol:** Okanogan Basin Monitoring & Evaluation Program - Adult Abundance - Redd Surveys v1.0

**Protocol Owner:** John Arterburn **Protocol State:** Draft



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2016	3/2/2016	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	3/1/2016	2/28/2018	Active	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. This work is carried out under WE C. for all OBMEP protocols and is an ongoing work element.
C. Install, operate and maintain PIT tag array in Canada	3/1/2016	2/28/2018	Active	Interrogation sites located at each documented spawning tributary to enumerate O. mykiss. Data collected at these sites will include date and time the tag was detected and recapture information uploaded to PTAGIS.
D. Mobilize equipment and conduct first pass main-stem Steelhead redd counts	3/15/2016	4/1/2016	Active	Conduct first round of main-stem Upper Columbia summer steelhead redd surveys. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
E. Conduct second pass main-stem redd counts	4/1/2016	4/15/2016	Active	Conduct second round of main-stem Upper Columbia summer steelhead redd surveys. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
F. Conduct third pass main-stem redd counts	4/15/2016	4/30/2016	Active	Conduct third round of main-stem Upper Columbia summer steelhead redd surveys. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
G. Conduct tributary redd surveys and demobilize equipment	5/1/2016	7/15/2016	Active	Conduct tributary redd surveys for Upper Columbia summer steelhead. Dates for surveys established from redd survey efforts conducted in previous years as part of this project. Remove temporary equipment for PIT-tag monitoring designed for adults only.
H. Store temporary PIT-tag equipments	7/15/2016	2/28/2017	Active	Temporary PIT tag arrays will be removed once flow conditions require or the date of July 15 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 office, repaired as needed, and secured in a safe place until needed next spring.
I. Mobilize equipment and conduct first pass main-stem redd counts	3/15/2017	4/1/2017	Active	Conduct first round of main-stem Upper Columbia summer steelhead redd surveys. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
J. Conduct second pass main-stem redd counts	4/1/2017	4/15/2017	Active	Conduct second round of main-stem Upper Columbia summer steelhead redd surveys. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
K. Conduct third pass main-stem redd counts	4/15/2017	4/30/2017	Active	Conduct third round of main-stem Upper Columbia summer steelhead redd surveys. Dates for surveys established from redd survey efforts conducted in previous years as part of this project.
L. Conduct tributary redd surveys and demobilize equipment	5/1/2017	7/15/2017	Active	Conduct tributary redd surveys for Upper Columbia summer steelhead. Dates for surveys established from redd survey efforts conducted in previous years as part of this project. Remove temporary equipment for video and PIT-tag monitoring designed for adults only.
M. Store temporary PIT-tag equipments	7/15/2017	2/28/2018	Active	Temporary PIT tag arrays will be removed once flow conditions require or the date of July 15 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 office, repaired as needed, and secured in a safe place until needed next spring.
<b>Deliverable: N. Data on adult anadromous fish</b>		2/28/2018	Active	<i>See the Deliverable Specification above</i>

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

Title: Monitor threats to salmonid habitats



**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 sites to be precisely replicated with rotating panels. 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. All work is completed following the protocol ID#9 in monitoringmethods.org.

To complete the population of the EDT model for the Okanogan River subbasin, an additional 35 sites per year are visited to collect habitat data for all 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, or averaged values which are not representative of the landscape. All work is completed following the protocol ID#8 in monitoringmethods.org.

Additional data collection to populate EDT level 2 attributes for Bed scour and fine sediment will be collected at identified spawning locations using data collected under work element E. These discrete data collection events will be used globally to help inform the model using quantifiable data. Additionally observational data will also be collected to inform the level 2 attribute of Icing which necessitates data to be collected in the winter.

Invertebrate data will be collected following OBMEP protocol (monitoring methods ID# 9). The primary use of these data will be as a response variable that relates to physical habitat changes monitored at these same sites. Invertebrate data are needed to maintain a high level of coordination with planners and other data collection agencies from the region in the United States and Canada and are mostly used to document watershed health and as a potential early indicator of habitat changes that might later impact fish species.

Subcontract with ONA for sites located in Canada.

Estimated Level of Effort: 2.63 FTEs/year.

**Deliverable Specification:** Physical habitat data will be collected annually at 50 sites (25 annual panel, 25 rotating panel, 75 for the 2-year contract period) 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.

Rapid assessment data will be collected for 32 level 2 attributes that populate the EDT model at reaches not covered by randomly selected habitat sites. In addition discrete data will be collected at spawning sites for bed scour and fine sediments in the gravels. Icing data will be observed for both main-stem and tributary habitats for 10 years to fill the level 2 attribute for icing.

Invertebrate standing crop and community structure is used to evaluate watershed health indicators at all tributary EMAP sampling locations.

All physical habitat data will be archived on the OBMEP server located at the Colville Tribes' Fish and Wildlife office in Omak, WA, and shared upon request. The next EDT analyses and technical reports are scheduled to be completed in late 2018 or early 2019 on its regular four year cycle. Once finalized, these technical reports will be posted to BPA and OBMEP web sites. Additional efforts to share this information among habitat practitioners will be conducted as part of our watershed coordination work element.

**Planned Metrics:**

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

**Locations:** 75

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

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

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

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

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

**Data Repositories:** Okanogan Basin Monitoring ([http://www.colvilletribes.com/obmep\\_project\\_data.php](http://www.colvilletribes.com/obmep_project_data.php)) & Evaluation Program (OBMEP) website

**Protocol:** Okanogan Basin Monitoring & Evaluation Program - Habitat Monitoring v1.0

**Protocol Owner:** John Arterburn **Protocol State:** Published





Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2016	3/2/2016	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	3/1/2016	2/28/2018	Active	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. This task is conducted for all OBMEP protocols under WE-C.
C. Finalize rapid assessment data collection tools for EDT reaches not covered by random sites	3/1/2016	2/28/2018	Active	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. This effort combines 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 or some median value that is not actually representative of the landscape.
D. Conduct annual training and group rapid assessment calibration	6/1/2016	7/15/2016	Active	Training will involve providing the data collection tools to a group of local experts and assessing a few sites 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 other 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 to calibrate all data collectors and get regional buy-in from local experts.
E. Physical Habitat Surveys of about 20 sites	7/1/2016	7/31/2016	Active	Collection of physical habitat data at randomly selected annual and panel 3 sites under published protocols at sites 1-20.
F. Conduct annual rapid assessment work	7/15/2016	9/30/2016	Active	Conduct rapid assessment at 35 EDT reaches that do not contain any existing OBMEP habitat sites, and a subset of EDT reaches where both methods are to be used for future comparison with randomly selected OBMEP habitat sites. A subset of rapid assessment reaches will be evaluated each year so that within 4 years all sites can be visited once and revisited every 4-years to update the EDT model prior to each subsequent model run.
G. Collect fine sediment samples from known spawning areas	7/18/2016	12/30/2016	Active	We will use the shovel method to collect fine sediment samples in known spawning locations in both tributary and mainstem locations throughout the Okanogan River basin
H. Physical Habitat Surveys of about 20 sites	8/1/2016	8/31/2016	Active	Collection of physical habitat data at randomly selected annual and panel 3 sites under published protocols at sites 21-40.
I. Physical Habitat Surveys of about 10 sites	9/1/2016	10/30/2016	Active	Collection of physical habitat data at randomly selected annual and panel 3 sites under published protocols at sites 41-50.
J. Collect Macro Invertebrate samples	9/15/2016	10/31/2016	Active	Macro invertebrate samples will be collected at each randomly selected habitat site.
K. Install and monitor scour chains	10/3/2016	12/30/2016	Active	Up to ten sites with 3 scour chains each will be installed and monitored annually in select tributaries and main-stem reaches where spawning is known to occur. These data will be used to calibrate a basin wide model that is used to populate the level 2 attribute for bedscour in the EDT model.
L. Process Macro invertebrate samples	11/1/2016	2/28/2017	Active	Macro invertebrate samples will be sent to a qualified lab for quantitative sampling and bug identification.
M. Collect icing data	12/1/2016	2/28/2017	Active	Icing data consists of visiting each tributary stream to the Okanogan River during periods of extreme cold to visually document the presence or absence of icing. These data are combined over a 10 year period to evaluate the potential impacts of icing on overwinter salmonid survival as an input parameter to the EDT model.
N. Process fine sediment samples	1/2/2017	2/28/2017	Active	Samples collected earlier in the summer will be processed in the winter as staff time allows using a roto-sieve and oven to determine fine sediments by weight. These data will then be converted to level 2 attributes and used to populate the EDT model.



Milestone Title	Start Date	End Date	Status	Milestone Description
O. Conduct annual training and group rapid assessment calibration	6/1/2017	7/15/2017	Active	Training will involve providing the data collection tools to a group of local experts and assessing a few sites 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 to calibrate all data collectors and get regional buy-in from local experts.
P. Physical Habitat Surveys of about 20 sites	7/1/2017	7/31/2017	Active	Collection of physical habitat data at randomly selected annual and panel 4 sites under published protocols at sites 1-20.
Q. Conduct annual rapid assessment work	7/15/2017	9/30/2017	Active	Conduct rapid assessment at 35 EDT reaches that do not contain any existing OBMEP habitat sites, and a subset of EDT reaches where both methods are to be used for future comparison with randomly selected OBMEP habitat sites. A subset of rapid assessment reaches will be evaluated each year so that within 4 years all sites can be visited once and revisited every 4-years to update the EDT model prior to each subsequent model run.
R. Collect fine sediment samples from known spawning areas	7/18/2017	12/30/2017	Active	We will use the shovel method to collect fine sediment samples in known spawning locations in both tributary and mainstem location throughout the Okanogan River basin
S. Physical Habitat Surveys of about 20 sites	8/1/2017	8/31/2017	Active	Collection of physical habitat data at randomly selected annual and panel 4 sites under published protocols at sites 21-40.
T. Physical Habitat Surveys of about 10 sites	9/1/2017	10/30/2017	Active	Collection of physical habitat data at randomly selected annual and panel 4 sites under published protocols at sites 41-50.
U. Collect Macro Invertebrate samples	9/18/2017	10/31/2017	Active	Macro invertebrate samples will be collected at each randomly selected habitat site.
V. Install and monitor scour chains	10/2/2017	12/29/2017	Active	Up to ten sites with 3 scour chains each will be installed and monitored annually in select tributaries and main-stem reaches where spawning is known to occur. These data will be used to calibrate a basin wide model that is used to populate the level 2 attribute for bedscour in the EDT model.
W. Process Macro invertebrate samples	11/1/2017	2/28/2018	Active	Macro invertebrate samples will be sent to a qualified lab for quantitative sampling and bug identification.
X. Process fine sediment samples	1/2/2018	2/28/2018	Active	Samples collected earlier in the summer will be processed in the winter as staff time allows using a roto-sieve and oven to determine fine sediments by weight. These data will then be converted to level 2 attributes and used to populate the EDT model.
<b>Deliverable: Y. Physical habitat data needed to serve regional needs and populate the EDT model</b>		2/28/2018	Active	<i>See the Deliverable Specification above</i>

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

Title: Water temperature and discharge monitoring data collection



**Description:**

As part of previous years analysis OBMEP has identified little value in the collection of most water quality indicators as they relate to salmonid survival. For example, Turbidity data unless collected during specific, sizeable, runoff events provides no real information that can be used for fish survival. Dissolved oxygen similarly is rarely found to be life threatening or stressful to salmonids when data are collected from streams during daylight hours. For most water quality parameters regional R,M&E experimental designs do not allow detailed enough data in regards to both time and space to be used as a measure of fish survival unless large numbers of continuous data loggers are deployed and this solution at present is far too costly. Therefore, water quality data collection will be discontinued in 2016 with the exception of discharge and temperature.

Discharge data is one of, if not the most important input variable used to measure fish survival, productivity, and capacity in any model. However, over the last few years, WDOE has eliminated all funding for real-time discharge and temperature data collection in the Okanogan River Basin. Therefore, OBMEP staff have undergone special USGS training for this transition beginning in 2014 using cost share funds so we could begin a new collaboration with USGS whereby our staff collect discharge data and maintain discharge sites and equipment following USGS standards and these data are QA/QC'd and published by USGS on their web page. Today, USGS collects real-time discharge at several locations along the mainstem Okanogan River and through cooperative agreements the Colville Tribes expanded the USGS discharge monitoring effort so that discharge records are available for the Okanogan River (3), Similkameen River and Loup Loup, Salmon, Omak, Johnson, Antoine, and Ninemile Creeks. Discharge data collection will follow well established USGS methodologies and all data will be posted to the USGS webpage @ <http://waterdata.usgs.gov/wa/nwis/rt>. Discharge in Canada will be measured on the Okanogan River at four locations by Water Survey Canada and on tributary streams a piezometer that can detect pressure will be used to establish stage data at all subwatersheds where anadromous fish 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.

After reviewing 10 years of water temperature data collected under OBMEP it was determined that to save time and resources no further data would be collected at panel sites. These data only occurred once every four years and annual variation in temperature swamps any signal change that might result from location. Therefore, a set of permanent water temperature monitoring locations will be established in the Okanogan beginning in October of 2016 to replace the former randomly selected sites. Site selection will follow the a few simple parameters such as: 1) Temperature loggers will be placed to coincide with discharge monitoring locations, 2) Annual Temperature monitoring sites will be located no closer together than one every 10 stream miles, unless a major water withdrawal or inflow occurs that has a high likelihood of measurable changing the stream's temperature profile, in which case a new site should be included either above or below this site to document this change. Our data suggest that for most streams temperature changes only occur in a measurable way over many miles of distance or when significantly different temperature water is added or subtracted or water is withdrawn to the point that little discharge remains and lastly, 3) sites should be easily accessible by road to make data downloads and equipment checks as efficient as possible. Both the total number of sites and the annual number of sites monitored will likely be reduced and cost savings will be used to expand juvenile salmonid monitoring in Canada. Temperature data will be collected using (2) Tidbit or Hobo data loggers at each site. Water temperature data downloads and equipment checking will occur after the Ice breakup, spring freshet, and before Ice formation. Data loggers will be set to collect data once per hour.

Estimated level of effort: 0.68 FTEs/year.

**Deliverable Specification:**

Subcontract with USGS and ONA for stream gauging of temperature and discharge and web hosting all data. Collect, verify, and post discharge and temperature data from USGS, and Water Survey 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 Water Survey Canada Okanogan River sites and Inkaneeep Creek and real-time water temperature data at USGS stations located along the Okanogan River mainstem at Oroville, Tonasket, and Malott, WA and on the Similkameen river at Nighthawk. Other USGS gauging stations located on Loup Loup, Salmon, Omak, Johnson, Bonaparte, Antoine, and Nine Mile Creeks are 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>

Water temperature and discharge data collected by the Colville Tribes are used for EDT model runs every 4 years. These data will be combined with other habitat data to populate the EDT model and produce a technical report every four years. Temperature data are also posted to our [okanoganmonitoring.org](http://okanoganmonitoring.org) page after being analyzed using our temperature reporting tool one year after these data are collected.

**Planned Metrics:**

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

**Locations:**

**Primary Focal Species:**

**Country:**

**State:**

Steelhead - Upper Columbia River DPS

Multiple

Multiple

**NPCC Subbasin:** OKANOGAN

**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 ([http://www.colvilletribes.com/obmep\\_project\\_data.php](http://www.colvilletribes.com/obmep_project_data.php)) (OBMEP) website  
 USGS National Water Information System (NWIS) database (<http://waterdata.usgs.gov/nwis>)  
**Protocol:** Okanogan Basin Monitoring & Evaluation Program - Water Quality Sampling v1.0  
**Protocol Owner:** John Arterburn **Protocol State:** Published

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Environmental compliance requirements complete	3/1/2016	3/2/2016	Completed	On-the-ground work associated with this work element cannot proceed until this milestone is complete. Milestone is complete when final documentation is received from BPA environmental compliance staff (completion can be based on pre-existing environmental documentation from BPA).
B. Download temperature data collected from deployment to spring thaw	3/1/2016	4/30/2016	Active	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.
C. Develop agreements with Environment Canada and USGS to operate, maintain, and post discharge data	3/1/2016	6/28/2016	Active	Develop the contract or agreements to operate, maintain, and post water quality gauging data for both temperature and discharge in the Okanogan drainage.
D. Review, revise, and Publish protocol, study design, and methods in monitoringmethods.org	3/1/2016	2/28/2018	Active	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. This task is conducted for all OBMEP protocols under WE-C.
E. Collect and post data collected at Environment Canada and USGS gauging stations	3/1/2016	2/28/2018	Active	All data collected by Water Survey 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.
F. Collect data, and calculate discharge for multiple tributaries in the Okanogan River Basin	3/1/2016	2/28/2018	Active	The Colville Tribes will carry out most of this work using OBMEP staff by collecting and maintaining stream gauges and data of a high enough standard to be published by USGS with hosting on the web for all to use. USGS publishes these data to their web page for Loup loup, Salmon Omak, Antoine, Johnson, Bonaparte, and Ninemile creeks plus expand Okanogan and Similkameen River discharge locations to include real-time water temperature monitoring for the benefit of multiple users.
G. Download temperature data after discharge returns to post freshet levels	5/1/2016	8/30/2016	Active	Data will be downloaded from electronic data logger after spring freshet discharges approximates return to a typical low flow pattern.
H. Deploy, Download, and calibrate temperature data loggers	9/1/2016	10/1/2016	Active	Data will be downloaded from two electronic data logger at each annual water temperature site at the end of each water year and loggers will be tested for accuracy before being redeployed for another year.
I. Download temperature data collected from deployment to spring thaw	2/1/2017	4/30/2017	Active	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.
J. Download temperature data after discharge returns to post freshet levels	5/1/2017	8/30/2017	Active	Data will be downloaded from electronic data logger after spring freshet discharges approximates return to a typical low flow pattern.
K. Deploy, Download, and calibrate temperature data loggers	9/1/2017	10/31/2017	Active	Data will be downloaded from two electronic data logger at each annual water temperature site at the end of each water year and loggers will be tested for accuracy before being redeployed for another year.
<b>Deliverable: L. Water temperature and discharge monitoring data</b>		2/28/2018	Active	<i>See the Deliverable Specification above</i>

**H: 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 subcontracts that help produce deliverables for the scope of work. Costs include only the direct expenditures by project staff and office 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 O&M of facilities and equipment is also included to cover the needs of this project and the people that it supports. There are also costs related to utilities and communications essential to the needs of this project.

Estimated Level of Effort: 0.28 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 their due dates.

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 costs 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. Attach initial FISMA Compliance Attestation (BPA risk category Low)	3/1/2016	3/1/2016	Active	<p>BPA contractors are required to protect their data and electronic systems consistent with the federal FISMA law (Federal Information Security Management Act of 2002). Your contract has been rated as "low risk" by BPA Cyber Security. The designated signatory for your organization may vary.</p> <p>Check with your COTR to see if BPA has already obtained, or will soon obtain through previous contracts, the attestation. If not, please work with your COTR to obtain a signed attestation confirming your organization's compliance with FISMA. Attestations can be in the form of a formal memorandum, letter, or email. An email will need to be cut and pasted into a word processing program. All attachments must be saved and uploaded as PDF. A sample attestation communication that describes the minimum information required can be found as a Pisces attachment at {<a href="https://pisces.bpa.gov/release/documents/DocumentViewer.aspx?doc=P137862">https://pisces.bpa.gov/release/documents/DocumentViewer.aspx?doc=P137862</a>}.</p> <p>Upload the attestation to Pisces under the new "FISMA Attestation" File Type, and type in the title as "Low-risk FISMA attestation". This milestone is considered complete when the contractor has uploaded an electronic copy of a signed attestation. Deadline: Start and end dates are both the first day of the contract. This work is completed under WE J of this contract.</p>
B. Accrual - Submit September estimate to BPA	8/10/2016	9/10/2016	Active	Provide BPA with an estimate of contract work that will occur prior to September 30 but will not be billed until October 1 or later. Generally, this should be done by September 10.
C. Facilitate inputting Cost Share information into Pisces at the Project level	9/30/2016	11/15/2016	Active	I am the sole contractor under this project. I will enter previous federal FY's Cost Share information on the Project's Cost Share tab by Nov 15. (Milestone starts Sep. 30 and ends Nov. 15)
D. Begin drafting contract renewal documents and conduct internal review as needed	8/1/2017	9/30/2017	Active	Your statement of work, line-item budget, and (if required) property inventory for your next contract are due to BPA at least 5 months prior to the contract start date (longer if your internal processes require more time to get the contract signed and in place prior to the start date).
E. Accrual - Submit September estimate to BPA	8/10/2017	9/9/2017	Active	Provide BPA with an estimate of contract work that will occur prior to September 30 but will not be billed until October 1 or later. Data must be input in to Pisces by September 10 (begins Aug 10, ends Sep 10).
F. Facilitate inputting Cost Share information into Pisces at the Project level	9/30/2017	11/15/2017	Active	I am the sole contractor under this project. I will enter previous federal FY's Cost Share information on the Project's Cost Share tab by Nov 15. (Milestone starts Sep. 30 and ends Nov. 15)



Milestone Title	Start Date	End Date	Status	Milestone Description
G. Confirm that FISMA compliance documentation for any subsequent contract is current	10/1/2017	10/31/2017	Active	Contact your COTR and check in Pisces to confirm that the FISMA compliance documentation for your subsequent contact is still current. If not, work with COTR to update documentation. (Due 125 days before the contract end date).  BPA contractors are required to protect their data and electronic systems consistent with the federal FISMA law (Federal Information Security Management Act of 2002). Your contract will be rated as "low risk" by BPA Cyber Security.
H. Submit contract renewal package (SOW, Excel budget, property inventory) to BPA COTR	9/15/2017	10/1/2017	Active	Once your statement of work (SOW) in Pisces is complete, and you have attached your line-item budget (LIB) and property inventory (PI) (if required), click the "Submit" button on the SOW tab to notify your COTR the package is ready for review.
I. Address comments and revise SOW, LIB, and PI as needed to get BPA manager approval	10/1/2017	11/15/2017	Active	Once your COTR and his or her BPA manager have reviewed your contract renewal package and returned any comments to you, you will need to provide responses and changes as needed to achieve approval from the BPA manager, who will then forward the package to the Contracting Officer.  This should be completed at least two months prior to the next contract start date, but may need to be 3 or 4 months depending on your internal processing time for contract signatures. If you have subcontracts that need to be signed prior to the contract start, it should be a minimum of 4 months.
J. Comply with all applicable federal, state, tribal and local safety requirements, including reporting	3/1/2016	2/28/2018	Active	As described in the contract's Terms and Conditions, the contract manager and contractor shall comply with all applicable federal, state, tribal and local safety laws, rules, regulations and requirements.
<b>Deliverable: K. A properly administered project and other deliverables as stipulated by BPA</b>		2/28/2018	Active	<i>See the Deliverable Specification above</i>

**I: 191. Watershed Coordination**

**Title:** Project coordination/public outreach

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

OBMEP employs multiple experimental designs with data collected throughout the Okanogan watershed. As many of the sampling sites fall within areas of private ownership, landowners must be contacted (public outreach) and access granted before field crews can conduct surveys. In prior years, landowners were contacted and permission granted as necessary to access most of these sites but things change over time requiring ongoing effort. Landowners are contacted annually to secure access to each year's sampling sites.

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.

Subcontract with ONA to provide support as needed in Canada

Estimated Level of Effort: 0.17 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 sampling sites. Landowner contacts and other coordination activities will be documented as part of the annual reporting WE. Additionally, OBMEP biologists will prepare and post material to our web-site and make professional presentations and disseminate summarized data to interested parties as requested.



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Attend local and regional meetings to conduct watershed coordination	3/1/2016	2/28/2018	Active	Conduct coordination with regional M&E entities. We anticipate at least two meetings per month. Regular attendance at Upper Columbia Regional Technical Team and Upper Columbia Annual Pre-season Field Coordination meetings. Occasional travel to attend meetings of the PNAMP (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 2016	3/1/2016	6/30/2016	Active	Contact private landowners to secure or maintain permission for OBMEP sampling sites.
C. Contact landowners for rotating panel to be sampled in 2017	3/1/2017	6/30/2017	Active	Contact private landowners to secure or maintain permission for OBMEP sampling sites.
D. Update and maintain web page and content	3/1/2016	2/28/2018	Active	This is an ongoing effort to make sure that the OBMEP web page remains updated and relevant.
E. Attend practitioner's workshops and other meetings	3/1/2016	2/28/2018	Active	OBMEP biologists are requested to be part of various workshops held throughout the year and we try to attend when requested. Other meetings include regular regional efforts that are supported by BPA such as PNAMP and the Coordinated Assessment, etc.
F. Attend RTT, Bilateral Okanogan workshop, and other regional RM&E meetings	3/1/2016	2/28/2018	Active	More locally driven meetings and workshops include but are not limited to Upper Columbia Regional Technical Team, Bilateral Okanogan Basin Technical Working Group, and Osoyoos Board of Control Fisheries Advisory Group, etc.
<b>Deliverable: G. Coordination efforts described in annual report, conferences attended, and web site maintained</b>		2/28/2018	Active	<i>See the Deliverable Specification above</i>

**J: 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. Between 2011 and 2015 we began to move the database to the forefront of our monitoring efforts. The current schema provides automated data up loads over the internet to a remote database located at the Sitka Technologies offices in Portland. Data are backed-up nightly onto the OBMEP server located in Omak at the Colville Fish and Wildlife office at PSIS. Our focus has been to have users spend less time collecting and managing these data so more emphasis can be placed on analyzing data and eliminating the need for paper reports by providing web accessible reporting tools and these functions will be a focus of our work beginning in 2016.

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 Upper Columbia Salmon Recovery Board and NOAA Fisheries regarding data roll-up to larger scales. Migration of data to larger scales will mostly occur through the regional data steward and coordinated assessment efforts underway at the regional scale.

Subcontracts will provide specialized technical resources for hosting and maintaining access by multiple entities, constructing software solutions, and database development; the Colville Tribes are responsible for data auditing and inclusion from data collection work elements, data reporting and analysis.

Estimated Level of Effort: 0.15 FTEs/year with considerable subcontracting effort.



**Deliverable Specification:** Input and manipulation of OBMEP data from 2004 - 2017 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 hosting, connectivity solutions, modifications, updating, and auditing to maintain the integrity of the database and effectively assimilate collected data and make these data available to outside interests.

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.

Copies of the OBMEP database are currently secured at three locations: one being held at Sitka Technologies in Portland Oregon; one held with the Upper Columbia Salmon Recovery Board located in Wenatchee, WA; and one held onsite at the OBMEP office located near Omak, WA.

**Data Repositories:** Okanogan Basin Monitoring & Evaluation Program (OBMEP) website ([http://www.colvilletribes.com/obmep\\_project\\_data.php](http://www.colvilletribes.com/obmep_project_data.php))

Milestone Title	Start Date	End Date	Status	Milestone Description
A. Develop an EDT report card exploration tool	3/1/2016	2/28/2017	Active	OBMEP biologists have defined a need to automate the generation of EDT version 3 "report cards" from model outputs and to be able to share those report cards interactively via the web as well. There are three levels of EDT outputs (Population, Diagnostic Unit, and Reach), with the latter two levels being nested within the former. The objective of this task is to display the outputs on the okanoganmonitoring.org web site, link them spatially to GIS assets (population boundaries, DU boundaries, and reaches), and provide drill-downs between different layers in the hierarchy.
B. Operate and Maintain the Habitat and OBMEP Databases	3/1/2016	2/28/2018	Active	<p>Sitka will work with Colville staff to cover the operations and maintenance activities associated with keeping the databases and okanoganmonitoring.org web site up to date, performing well, and in compliance with the Service Level Agreements in our FISMA compliant hosting environment.</p> <p>In the past year, Sitka has made an investment in web-enabled enterprise GIS capabilities by developing its own GIS data portal for documenting and sharing spatial datasets that Sitka generates or acquires from clients and third parties (see <a href="http://gis.sitkatech.com">http://gis.sitkatech.com</a>). There is no license fee or recurring charge for registering geospatial datasets on this portal – only nominal labor charges that are required to accept the layer(s), assemble metadata, and enter them into the portal database itself.</p> <p>Through separate funding provided by BPA, Sitka can extend use of ArcGIS for Server to the OBMEP program at no charge. Because of these economic advantages, Sitka proposes that we become the official repository for OBMEP related GIS datasets that are to be shared via the web. In addition to the status quo managed service charge, a nominal amount of funding is recommended in this task to accommodate relatively small anticipated needs for GIS data management.</p>





Milestone Title	Start Date	End Date	Status	Milestone Description
C. Enhance and improve okanoganmonitoring.org web site and database	3/1/2016	2/28/2018	Active	<p>The okanoganmonitoring.org web site now supports:</p> <ul style="list-style-type: none"> <li>• login and role based authentication</li> <li>• display and download of collected habitat and population datasets since 2011</li> <li>• static (i.e. not configurable) charting of some datasets</li> <li>• a limited interactive map showing reaches and monitoring sites in the Okanogan with the ability to filter data grids based on site location</li> </ul> <p>In addition to the accomplishments above, at the time only 50% of the data stored in the pre-2011 database structure has been migrated into the current database schema. An important objective of the program is to consolidate the number of disparate databases into one schema to lower support costs and increase the reporting utility of the data contained therein.</p> <p>Taken as a whole, the work accomplished in the 2014-2015 period represents a major step forward for the program, but there is additional work identified for 2016-2017 that this task aims to complete. Specific objectives of this task include:</p> <ul style="list-style-type: none"> <li>• Eliminating the last remaining desktop application that has a dependency on the old database structure</li> <li>• Completing the merge of 2005-2011 data into the current schema, mostly fisheries and video data</li> <li>• Adding additional interactive charts to replace the static images used in some portions of the application today</li> <li>• Improving QA/QC capabilities by introducing bivariate plots on certain datasets</li> <li>• Enhancing interactive map displays by including visualizations and download capabilities without having to leave the map.</li> <li>• Making select data available for download to the general public</li> <li>• Exposing certain data discovery and download features via web APIs</li> </ul>
D. Modify field device software	4/1/2016	10/31/2017	Active	<p>In the 2014-2015 performance period, Sitka assumed responsibility for the field data collection software that runs on the Windows 7 based Trimble Yuma device. This software is responsible for capturing, performing initial quality control, and transmitting habitat data from surveys across the Okanogan to the centralized program database in Portland. Changes made to the software in the previous funding cycle were targeted at allowing survey data to be transmitted to the database via the public Internet rather than over a Virtual Private Network as it did before. This was a significant change to the architecture of the application and as a result, few functional changes were included. This task proposes to provide a relatively small amount of funding for the 2016 and 2017 field seasons to:</p> <ul style="list-style-type: none"> <li>• Make small numbers of minor enhancements and bug fixes to the data collection application</li> <li>• Engage in pre-season testing and tuning activities</li> <li>• Support migration of the application to newer hardware should CCT elect to upgrade or replace the Yuma devices prior to March 2018.</li> </ul>
<b>Deliverable: E. Input this year's data, plus hosting, modification and auditing of our database</b>		2/28/2018	Active	<i>See the Deliverable Specification above</i>

**K: 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 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 affected 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 the status of temperature at a given site to determine thresholds (e.g., LC50 for summer steelhead during incubation is 18 degrees and below Zosel Dam, this threshold is violated regularly so trends will look at the number of days in May and June that this threshold is violated each year plotted and a linear regression fitted to determine if this trend is improving or getting worse, and if so, at what rate). This is only one example but each data type will be considered in a similar context to apply biologically meaningful trends to each data set that provide important information for how environmental changes are affecting salmonids over time.

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 outmigration and return 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: 0.35 FTEs/year.

**Deliverable Specification:**

Synthesize collected data over time to evaluate trend characteristics for inclusion in future technical reports or manuscripts.

**Planned Metrics:**

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

**Locations:**

**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 ([http://www.colvilletribes.com/obmep\\_project\\_data.php](http://www.colvilletribes.com/obmep_project_data.php)) (OBMEP) website

**Protocol:**

Okanogan Basin Monitoring & Evaluation Program - Habitat Monitoring v1.0

**Protocol Owner:**

John Arterburn

**Protocol State:**

Published

**Area of Inference:**

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Milestone Title	Start Date	End Date	Status	Milestone Description
A. Review, revise, and Publish protocol, study design, and methods in monitoringmethods.org	3/1/2016	2/28/2018	Active	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. This task is conducted for all OBMEP protocols under WE-C.
B. Analyze data on returning adult steelhead 2016	6/1/2016	2/28/2017	Active	Data taken from underwater video stations, redd surveys, PIT tag detections, and weir traps will be analyzed in conjunction to create a yearly (2016) 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 an escapement and spawning distribution report as well as included in the progress (annual) report. These data are kept in a multi-year excel spreadsheet for continuing analysis dating back to 2005, trend graphs for each diagnostic unit by origin are available electronically at: <a href="https://www.okanoganmonitoring.org/Chart/Sites Hatchery">https://www.okanoganmonitoring.org/Chart/Sites Hatchery</a> .
C. Analyze data on returning adult steelhead 2017	6/1/2017	2/28/2018	Active	Data taken from underwater video stations, redd surveys, PIT tag detections, and weir traps will be analyzed in conjunction to create a yearly (2017) 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 an escapement and spawning distribution report as well as included in the progress (annual) report. These data are kept in a multi-year excel spreadsheet for continuing analysis dating back to 2005, trend graphs for each diagnostic unit by origin are available electronically at: <a href="https://www.okanoganmonitoring.org/Chart/Sites Hatchery">https://www.okanoganmonitoring.org/Chart/Sites Hatchery</a> .
D. Determine the feasibility of calculating tributary-specific out-migrant estimates using PIT tags	3/1/2016	2/28/2018	Active	Beginning in 2012, OBMEP crews began PIT-tagging age 1+ steelhead in tributaries to the Okanogan River with permanent PIT-tag interrogation sites. We will test if a viable population estimate of out-migrating steelhead can be estimated based upon recaptures of PIT-tags. Testing of array efficiency and tag retention will also be a part of these tests. The desire here is to be able to estimate smolt production of natural origin steelhead in a more efficient manner than using rotary screw traps.
<b>Deliverable: E. Summaries of collected data will be provided in annual and technical reports</b>		2/28/2018	Active	<i>See the Deliverable Specification above</i>

**L: 132. Produce (Annual) Progress Report**

<b>Title:</b>	PLACEHOLDER: Submit Progress Report for the period 1/1/15 to 12/31/15
<b>Description:</b>	This WE is a placeholder for submission of the CY 2015 Annual Report which is a Deliverable under contract 63963. The milestone for this WE will be canceled when the 2015 Annual Report is attached under contract 63963.
<b>Deliverable Specification:</b>	The Deliverable is considered complete when the final report is posted. It usually takes BPA 30-45 days to post the final PDF version of a report. This milestone's end date should therefore be 45 days after the final version is uploaded in Pisces. You will receive an email from BPA confirming that your report has been finalized and posted to the web. Mark this milestone complete when you have confirmed your final report has been posted. If you do not receive such an email after 45 days, contact your COTR.
<b>Planned Metrics:</b>	* Start date of reporting period : 1/1/2015 * End date of reporting period : 12/31/2015

Milestone Title	Start Date	End Date	Status	Milestone Description
<b>Deliverable: A. Completed 2015 Annual Report</b>		3/31/2016	Active	<i>See the Deliverable Specification above</i>

**M: 132. Produce (Annual) Progress Report**

<b>Title:</b>	Produce annual progress report for 1/1/2016 - 12/31/2016
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**Description:** The progress report summarizes the project goal, objectives, hypotheses, completed and uncompleted deliverables, problems encountered, lessons learned, and long-term planning. Examples of long-term planning include future improvements, new directions, or level of effort for contract implementation, including any ramping up or ramping down of contract components or of the project as a whole.

Progress reports must conform to BPA guidelines. See the "formatting guidelines" link at the Technical Reports and Publications page: <http://efw.bpa.gov/IntegratedFWP/technicalreports.aspx>.

Estimated Level of Effort: 0.26 FTEs.

**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 OBMEP 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.

**Planned Metrics:**  
 \* Start date of reporting period : 1/1/2016  
 \* End date of reporting period : 12/31/2016

Milestone Title	Start Date	End Date	Status	Milestone Description
A. RM&E Technical: Prepare for RM&E Technical Report. Review the revised (2014) guidance & template	8/1/2016	9/14/2016	Active	Review the newly-revised guidance & template for your RME Technical Report. BPA Fish and Wildlife project sponsors who have the following work elements in their contracts are required to complete a RM&E technical report: 156 Develop RM&E Methods and Designs, 157 Collect/Generate/Validate Field and Lab Data, 158 Mark and Tag Animals, and/or 162 Analyze/Interpret Data. Reports must show cumulative results and synthesis for the duration data collection/analysis studies. Final RME reports are due in March to align with regulatory reporting timelines. (Milestone start/end: August 1 - September 14)
B. Distribute Progress Report for Internal Contractor Review	9/1/2016	12/30/2016	Active	Internal review will be conducted by John Arterburn, Brian Miller, Wes Tibbits, and Casey Baldwin before being reviewed externally or being uploaded.
C. RM&E Technical: Upload draft RM&E Technical Report (MS Word) for BPA review	9/15/2016	1/13/2017	Active	Upload your draft RM&E report into the Pisces Attachments tab as an MS Word document as a "Technical, Draft" for BPA review. BPA will review the draft RM&E report. If your Word file is too big to be uploaded, contact Pisces Support (support@cbfish.org).  For more information on structure and content of your report, please use the newly-revised guidance & template for RME Reports located at <a href="https://www.cbfish.org/Help.mvc/GuidanceDocuments">https://www.cbfish.org/Help.mvc/GuidanceDocuments</a> .  (Milestone start/end: September 15 - January 15).
D. RM&E Technical: Upload finalized RM&E Technical Report (MS Word) for BPA to publish	1/16/2017	2/28/2017	Active	Address any BPA comments on the draft and re-upload finalized report into the Pisces Attachments tab as an MS Word document as a "Technical, draft." (Note: This MS Word format is a change in policy. BPA staff will now convert it to a PDF.)  (Milestone start/end: Jan 16 - Mar 15)
<b>Deliverable: E. Submit Final 2016 Annual Report to BPA COTR for posting</b>		2/28/2017	Active	<i>See the Deliverable Specification above</i>

**N: 132. Produce (Annual) Progress Report**

**Title:** Produce annual progress report for 1/1/2017 - 12/31/2017

**Description:** The progress report summarizes the project goal, objectives, hypotheses, completed and uncompleted deliverables, problems encountered, lessons learned, and long-term planning. Examples of long-term planning include future improvements, new directions, or level of effort for contract implementation, including any ramping up or ramping down of contract components or of the project as a whole.

Progress reports must conform to BPA guidelines. See the "formatting guidelines" link at the Technical Reports and Publications page: <http://efw.bpa.gov/IntegratedFWP/technicalreports.aspx>.

Estimated Level of Effort: 0.26 FTEs.



**Deliverable Specification:** The Deliverable is considered complete when the final report is posted. It usually takes BPA 30-45 days to post the final PDF version of a report. This milestone's end date should therefore be 45 days after the final version is uploaded in Pisces. You will receive an email from BPA confirming that your report has been finalized and posted to the web. Mark this milestone complete when you have confirmed your final report has been posted. If you do not receive such an email after 45 days, contact your COTR.

**Planned Metrics:**

\* Start date of reporting period : 1/1/2017

\* End date of reporting period : 12/31/2017

Milestone Title	Start Date	End Date	Status	Milestone Description
A. RM&E Technical: Prepare for RM&E Technical Report. Review the revised (2014) guidance & template	8/1/2017	9/14/2017	Active	Review the newly-revised guidance & template for your RME Technical Report. BPA Fish and Wildlife project sponsors who have the following work elements in their contracts are required to complete a RM&E technical report: 156 Develop RM&E Methods and Designs, 157 Collect/Generate/Validate Field and Lab Data, 158 Mark and Tag Animals, and/or 162 Analyze/Interpret Data. Reports must show cumulative results and synthesis for the duration data collection/analysis studies. Final RME reports are due in March to align with regulatory reporting timelines. (Milestone start/end: August 1 - September 14)
B. Distribute Progress Report for Internal Contractor Review	9/1/2017	12/30/2017	Active	Internal review will be conducted by John Arterburn, Brian Miller, Wes Tibbits, and Casey Baldwin before being reviewed externally or being uploaded.
C. RM&E Technical: Upload draft RM&E Technical Report (MS Word) for BPA review	9/15/2017	1/15/2018	Active	Upload your draft RM&E report into the Pisces Attachments tab as an MS Word document as a "Technical, Draft" for BPA review. BPA will review the draft RM&E report. If your Word file is too big to be uploaded, contact Pisces Support (support@cbfish.org).  For more information on structure and content of your report, please use the newly-revised guidance & template for RME Reports located at <a href="https://www.cbfish.org/Help.mvc/GuidanceDocuments">https://www.cbfish.org/Help.mvc/GuidanceDocuments</a> .  (Milestone start/end: September 15 - January 15).
D. RM&E Technical: Upload finalized RM&E Technical Report (MS Word) for BPA to publish	1/16/2018	2/28/2018	Active	Address any BPA comments on the draft and re-upload finalized report into the Pisces Attachments tab as an MS Word document as a "Technical, draft." (Note: This MS Word format is a change in policy. BPA staff will now convert it to a PDF.)  (Milestone start/end: Jan 16 - Mar 15)
<b>Deliverable: E. Completed Annual Report</b>		2/28/2018	Active	<i>See the Deliverable Specification above</i>

**O: 202. Produce BiOp RPA Report**

Title: BiOp RPA Report for CY 2016

**Description:**

Projects that have claimed that they support one or more RM&E RPAs (i.e., RPAs 50-73) under the FCRPS BiOp are required to report their results. To facilitate the summary of these results across the entire Columbia River Basin, and to provide more clarity as to the format required under the BiOp, these reports are required to be completed online. If desired, the required information can be prepared in MS Word, and pasted into cbfish. For more guidance see [http://www.cbfish.org/Content/tutorials/Reporting\\_Guidance\\_BiOp\\_2013.pdf](http://www.cbfish.org/Content/tutorials/Reporting_Guidance_BiOp_2013.pdf).

The data collected by this project are placed in a database 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 involved 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 the "expert panel process."

Our reports will also focus on informing local agencies involved 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.

Submit BiOp RM&E Report in cbfish.org for Calendar Year 2014 and 2015. Projects that have claimed that they support one or more RM&E RPAs (i.e., RPAs 50-73) under the FCRPS BiOp are required to report their results. To facilitate the summary of these results across the entire Columbia River Basin, and to provide more clarity as to the format required under the BiOp, separate BiOp reports are now required to be completed online. If desired, the required information can be prepared in MS Word, and be pasted into cbfish.

The online BiOp RPA report in cbfish (<https://www.cbfish.org>) should include the data, analyses, and data management completed by your project by December 31st. Any activity after the last day of the Calendar Year should be included in a subsequent BiOp report. For example, if you have completed redd surveys, but have not completed the analyses, you will report the preliminary data (# of redds). You do not need to rush your analyses; they may be reported in the subsequent RPA report.

For each RPA, follow the directions in cbfish for each of the three sections and, as appropriate, input graphical or tabular data, accompanied by explanatory text. These are cumulative summary reports and should show relevant results for the life of your project. Each year, note trends and whether they are changing from one year (or groups of years) to the next.

In addition to the annual BiOp reporting and our habitat reports once every 4 years we will also regularly post or update analyzed data to the web at: <https://www.okanoganmonitoring.org/Home/Index>.

Estimated level of Effort: 0.31 FTEs/year.

**Deliverable Specification:**

The online BiOp RPA report in cbfish (<https://www.cbfish.org/BiologicalOpinionAction.mvc/Index/2014/BiOpRpaStatus>) should include the data, analyses, and data management completed no later than December 31st. Any activity after the last day of the Calendar Year should be included in a subsequent BiOp report. For example, if you have completed redd surveys, but have not completed the scale analyses, you will report the preliminary data (# of redds), but not (incomplete) age distributions of carcasses, which would be reported in the subsequent CY report.

For each RPA, follow the directions in cbfish for each of the three sections and, input completed graphical or tabular data, accompanied by any complete explanatory text. These are cumulative summary reports and should show relevant results for the life of your project. Each year, note trends and whether they are changing from one year (or groups of years) to the next.

In FY2016 we plan to work on completing the the following reports;

2016 Annual Summer steelhead adult abundance report  
BiOP RPA reporting through cbfish.org

In FY2017 we plan to work on completing the the following reports;

2017 Annual Summer steelhead adult abundance report  
BiOP RPA reporting through cbfish.org

Other reports may be produced as time and resources allow.

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



Milestone Title	Start Date	End Date	Status	Milestone Description
A. Download RPA questions from cbfish.org	12/1/2016	12/31/2016	Active	To prepare for your RPA report, 1) Go to www.cbfish.org and log in, 2) Navigate to your project and select "BiOp Annual Report" from the menu on the left, 3) Click on "Input Needed" for each applicable RPA to find your RPA reporting requirements so you will know how much time to set aside for this task. You may also click the "download RPA doc" button to get all RPA questions in one MS Word document. 4) Use "Request Review" link to email COTR or BPA RM&E RPA lead to request help or for review of draft content. For further guidance, see: <a href="https://www.cbfish.org/Content/tutorials/Reporting_Guidance_BiOp_2013.pdf">https://www.cbfish.org/Content/tutorials/Reporting_Guidance_BiOp_2013.pdf</a> (Milestone start/end: July 1 – September 30)
B. Draft calendar year report in cbfish.org	1/1/2017	1/31/2017	Active	For guidance on completing your report, see: <a href="https://www.cbfish.org/Content/tutorials/Reporting_Guidance_BiOp_2013.pdf">https://www.cbfish.org/Content/tutorials/Reporting_Guidance_BiOp_2013.pdf</a> . If you have questions or would like BPA to review your draft, you may email RMEsupport@bpa.gov and your COTR to send them your working draft in Word or notify them to review in cbfish.org by using the "Request Review" email icon link to e-mail your COTR & BPA RM&E RPA lead. (Milestone start/end: September 30 - February 28)
C. Download RPA questions from cbfish.org	1/15/2017	2/28/2017	Active	To prepare for your RPA report, 1) Go to www.cbfish.org and log in, 2) Navigate to your project and select "BiOp Annual Report" from the menu on the left, 3) Click on "Input Needed" for each applicable RPA to find your RPA reporting requirements so you will know how much time to set aside for this task. You may also click the "download RPA doc" button to get all RPA questions in one MS Word document. 4) Use "Request Review" link to email COTR or BPA RM&E RPA lead to request help or for review of draft content. For further guidance, see: <a href="https://www.cbfish.org/Content/tutorials/Reporting_Guidance_BiOp_2013.pdf">https://www.cbfish.org/Content/tutorials/Reporting_Guidance_BiOp_2013.pdf</a> (Milestone start/end: July 1 – September 30)
<b>Deliverable: D. Submit BiOp RPA Report in cbfish</b>		2/28/2017	Active	<i>See the Deliverable Specification above</i>

**P: 202. Produce BiOp RPA Report**

Title: BiOp RPA Report for CY 2017

**Description:**

Projects that have claimed that they support one or more RM&E RPAs (i.e., RPAs 50-73) under the FCRPS BiOp are required to report their results. To facilitate the summary of these results across the entire Columbia River Basin, and to provide more clarity as to the format required under the BiOp, these reports are required to be completed online. If desired, the required information can be prepared in MS Word, and pasted into cbfish. For more guidance see [http://www.cbfish.org/Content/tutorials/Reporting\\_Guidance\\_BiOp\\_2013.pdf](http://www.cbfish.org/Content/tutorials/Reporting_Guidance_BiOp_2013.pdf).

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Estimated level of Effort: 0.31 FTEs/year.

**Deliverable Specification:**

The online BiOp RPA report in cbfish (<https://www.cbfish.org/BiologicalOpinionAction.mvc/Index/2014/BiOpRpaStatus>) should include the data, analyses, and data management completed no later than December 31st. Any activity after the last day of the Calendar Year should be included in a subsequent BiOp report. For example, if you have completed redd surveys, but have not completed the scale analyses, you will report the preliminary data (# of redds), but not (incomplete) age distributions of carcasses, which would be reported in the subsequent CY report.

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Milestone Title	Start Date	End Date	Status	Milestone Description
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B. Draft calendar year report in cbfish.org	1/1/2018	1/31/2018	Active	For guidance on completing your report, see: <a href="https://www.cbfish.org/Content/tutorials/Reporting_Guidance_BiOp_2013.pdf">https://www.cbfish.org/Content/tutorials/Reporting_Guidance_BiOp_2013.pdf</a> . If you have questions or would like BPA to review your draft, you may email RMEsupport@bpa.gov and your COTR to send them your working draft in Word or notify them to review in cbfish.org by using the "Request Review" email icon link to e-mail your COTR & BPA RM&E RPA lead. (Milestone start/end: September 30 - February 28)
C. Finalize calendar year report in cbfish.org and click Publish by March 15	1/15/2018	2/28/2018	Active	The final version is due by March 15. (Milestone start/end: December 31 - March 15)
<b>Deliverable: D. Submit BiOp RPA Report in cbfish</b>		2/28/2018	Active	<i>See the Deliverable Specification above</i>

Inadvertent Discovery Instructions

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

Inadvertent Discovery of Cultural Resources Procedure form:  
<http://bpa.gov/IntegratedFWP/InadvertentDiscoveryProcedure.pdf>