



### Statement of Work Report

**Project Title:** Monitor/Eval Okanogan Basin Pr  
**Project #:** 2003-022-00  
**Contract Title:** 2003-022-00 EXP MONITOR/EVAL OKANOGAN BASIN NATURAL PRODUCTION  
**Contract #:** 26654  
**Province:** Columbia Cascade      **Subbasin:** Okanagon  
**Workorder ID:** 142820      **Task ID:** 1  
**Perf. Period Budget:** \$763,482      **Perf. Period:** 7/1/2001 - 9/30/2004  
**Contract Type:** Contract (IGC)      **Pricing Type:** Cost Reimbursement (CNF)  
**Contractor(s):** Colville Confederated Tribes (Prime - COLVILLE00)  
**BPA Internal Ref:** 26654

**Contacts:**

Name	Role	Organization	Phone	Email	Address
Sarah Branum	COTR	Bonneville Power Administration	(503) 230-5115	stbranum@bpa.gov	P.O. Box 3621, Mailstop KEWU-4 Portland OR 97213-3621
Christine Read	Contracting Officer	Bonneville Power Administration	(503) 230-5321	clread@bpa.gov	P.O. Box 3621, Mailstop - TLOS-4 Portland, OR 97208-3621
John Arterburn	Contract Manager	Colville Confederated Tribes	(509) 422-7424	john.arterburn@colvilletribes.com	Highway 155 N Nespelem WA 99155
Cindy McCartney	Administrative Contact	Colville Confederated Tribes	(509) 634-2126	cindy.mccartney@colvilletribes.com	P.O. Box 150 Nespelem WA 99155
Mari Duran	Administrative Contact	Colville Confederated Tribes	(509) 634-2109	mari.duran@colvilletribes.com	P.O. Box 150 Nespelem WA 99155-
Kimberly St Hilaire	Env. Compliance Lead	Bonneville Power Administration	(503) 230-5361	krsthilaire@bpa.gov	

**Work Element Table of Contents:**

<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
A : 156. Develop RM&E Methods and Designs - Complete field protocol manual		\$17,871	(2 %)
B : 165. Produce Environmental Compliance Documentation - Environmental Compliance		\$6,192	(1 %)
C : 185. Produce Pisces Status Report - Quarterly status reports in Pisces		\$1,499	(0 %)
C : 132. Produce Annual Report - Produce annual report based on tasks identified within this scope of work		\$5,401	(1 %)



<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
D : 119. Manage and Administer Projects - Manage Projects: produce invoices, accrual estimates, develop contracts, etc.		\$42,639	(6 %)
E : 118. Coordination - Project coordination/public outreach		\$38,158	(5 %)
F : 160. Create/Manage/Maintain Database - Complete, manage, and maintain database		\$22,974	(3 %)
G : 70. Install Fish Monitoring Equipment - Design, build, and install picket-weir traps	*	\$5,536	(1 %)
H : 157. Collect/Generate/Validate Field and Lab Data - Enumerate adult anadromous fish from select sites throughout the Okanogan subbasin	*	\$86,610	(11 %)
I : 175. Produce Design and/or Specifications - Design Malott video counting weir		\$33,441	(4 %)
J : 157. Collect/Generate/Validate Field and Lab Data - Operate & maintain real-time discharge, water temperature gauging stations in the Okanogan subbasin	*	\$67,197	(9 %)
K : 148. Install Flow Measuring Device - Install one real-time stream gauging station on Nine-Mile Creek	*	\$12,960	(2 %)
L : 157. Collect/Generate/Validate Field and Lab Data - Collect continous water temperature data from 35 to 40 sites throughout the Okanogan River basin	*	\$25,010	(3 %)
M : 157. Collect/Generate/Validate Field and Lab Data - Collect instantaneous water quality data from 35 to 40 sites throughout the Okanogan River basin	*	\$74,593	(10 %)
N : 157. Collect/Generate/Validate Field and Lab Data - Collect physical habitat data at up to 50 EMAP sampling sites	*	\$78,564	(10 %)
O : 157. Collect/Generate/Validate Field and Lab Data - Conduct steelhead redd counts from index sites throughout the Okanogan River subbasin	*	\$31,780	(4 %)
P : 157. Collect/Generate/Validate Field and Lab Data - Smolt trapping for data on outmigrating anadromous fish from the Okanogan River subbasin	*	\$94,357	(12 %)
Q : 157. Collect/Generate/Validate Field and Lab Data - Snorkel for data on juv summer steelhead abundance at EMAP sites throughout the Okanogan subbasin	*	\$31,522	(4 %)
R : 156. Develop RM&E Methods and Designs - Conduct pilot study to determine best methods and indexes for macroinvertebrates		\$12,695	(2 %)
S : 157. Collect/Generate/Validate Field and Lab Data - Generate observational data for summer steelhead fry to aid in understanding seasonal movements	*	\$8,612	(1 %)
T : 156. Develop RM&E Methods and Designs - Determine methodologies for collecting and analyzing remote sensed data in the Okanogan subbasin		\$11,669	(2 %)



<u>Work Element - Work Element Title</u>	<u>EC Needed*</u>	<u>Estimate</u>	<u>(%)</u>
U : 162. Analyze/Interpret Data - Analyze collected and historical data on habitat, biological, and water quality parameters		\$28,937	(4 %)
V : 161. Disseminate Raw/Summary Data and Results - Workshop/conference attendance and publication		\$25,265	(3 %)
Total:		<hr/>	
		\$763,482	

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

**Contract Description:**

2006 Statement of Work

Performance and Budget Period: March 1, 2006 - February 28, 2007

Project title: Design and Conduct Monitoring and Evaluation Associated with Re-establishment of Okanogan Basin Natural Production.

Project number: 200302200

Technical Contact: John Arterburn, Fisheries Biologist II  
 Colville Confederated Tribes, Fish and Wildlife Department  
 23 Brooks Tracts Rd. Omak, WA 98841(509) 422-7424  
 john.arterburn@colvilletribes.com

Contracting Contact: Cindy McCartney, Administrative Assistant  
 Colville Confederated Tribes, Fish and Wildlife Department  
 P.O. Box 150, Nespelem, WA 99155  
 (509) 634-2126  
 cindy.mccartney@colvilletribes.com

**Project goal:**

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

1. Determine if there is a statistically significant difference in biological parameters of summer/fall, spring Chinook, sockeye, and steelhead in the Okanogan basin (7-20+ year time frame). Looking for changes over time within a species.
2. Determine if over time there is a statistically significant difference in selected physical habitat parameters and characteristics for the Okanogan basin resulting from the cumulative benefits of habitat actions (7-20+ year time frame).
3. Determine if over time there is a statistically significant difference in selected water quality parameters for the Okanogan basin (7-20+ year time frame).
4. Research select data gaps and critical questions throughout the Okanogan sub-basin for all anadromous species and life history stages identified in the Okanogan River subbasin plan, state salmon recovery plan, federal recovery plans, and to address emerging management needs (1-5+ year time frame).
5. Conduct a baseline Okanogan Basin inventory & analysis to: a.) Collect data, to raise physical habitat data to an empirical level for use in EDT; b.) Review, standardize and incorporate historical and current fish population distributions; and c.) collect information necessary to fill indetified data gaps, for use in EDT modeling runs or to assist in future enhancement planning processes (1-20+ year time frame).



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

#### Primary Goal for 2006:

Implement a basin wide monitoring and evaluation program and begin limited data collection and construction of needed infrastructure. This monitoring and evaluation program will provide status and trend data for all anadromous fish species in the Okanogan River basin for the next 20 years

#### Background:

A coordinated and comprehensive approach to the monitoring and evaluation of status and trend in anadromous populations and their habitats is needed to support restoration efforts in the Columbia Cascade Province and in the Okanogan subbasin in particular. Currently, independent research projects and some monitoring activities are conducted by various state and federal agencies, tribes, and to some extent by watershed councils, conservation districts, or landowners, but there has been no overall framework for coordination of efforts or for interpretation and synthesis of results until now.

Managers often implement actions within tributary streams to improve the status of fish populations and their habitats. Until recently, there was little incentive to monitor such actions to see if they met their desired effects. Many programs require that funded actions include monitoring efforts and coordinated measures to reduce duplication or contrary effort and to provide a process for more universal reporting and strategic planning. Within the Upper Columbia Basin in Washington State, several different organizations, including federal, state, tribal, local, and private entities currently implement tributary actions and conduct independent monitoring studies. Because goals and objectives are unique for each project; entities are using different monitoring approaches and protocols. In some cases, different entities are measuring the same (or similar) things in the same streams with little coordination or awareness of each others efforts. The Upper Columbia Regional Technical Team (RTT) is aware of this problem and developed a monitoring strategy (Hillman 2004) that if properly implemented would reduce redundancy, increase efficiency, and meet the goals and objectives of various entities.

We propose that the structure and methods employed by the Monitoring Strategy for the Upper Columbia Basin (Hillman 2004, Peck et al. 2001) be extended to the Okanogan subbasin of the Columbia Cascade Province. This approach is fully consistent with the original 2003 project proposal for the Okanogan M&E program but provides much more detail. This project is high priority based on the high level of emphasis the NPCC Fish and Wildlife Program, Subbasin summaries, NOAA fisheries guidance, and emphasis the Independent Scientific Review Panel have placed on monitoring and evaluation. The overall goal of this program is to provide the necessary data to guide restoration and adaptive management in the region.

The Okanogan M&E program itself is specifically designed to monitor key components of the ecosystem including biological, physical habitat, and water quality parameters. The program will also contain components to develop baseline assessments where data are currently unavailable and conduct preliminary studies that help fill existing data gaps or help clarify research or management questions.

We selected sites using the EMAP (GRTS+) sampling framework with assistance from the Environmental Protection Agency to produce an array of statistically based and spatially explicit monitoring sites throughout the Okanogan River basin (Maps available upon request). These sites will be monitored over the next 20 years to quantify trends in physical habitat, water quality, and biological parameters. Each year, up to 50 spatially balanced, randomly selected reaches are sampled for physical, biological, and water quality



parameters in the Okanogan River subbasin.

**Facilities and Equipment:**

All facilities and equipment will be sited at 23 Brooks Tracts Rd, maintained and under the general management of the Confederated Colville Tribes Fish and Wildlife Program. Mr. Joe Peone, Director of the Fish and Wildlife Program, will have overall responsibility for the implementation and management of the M&E program.



## Statement of Work Report

### Work Element Details

#### A: 156. Develop RM&E Methods and Designs

**Title:** Complete field protocol manual

**Description:** Determine the best and most appropriate field protocols for collecting data related to biological, water quality, and physical habitat sampling. Biological protocols will include smolts trapping, snorkeling, redd surveys, and adult enumeration as deemed appropriate and necessary. Water quality sampling will include monitoring for discharge, temperature, conductivity, turbidity, dissolved oxygen, pH. Other indicators will be considered and added as necessary and appropriate.

Protocols will be developed based on information collected from the upper Columbia Strategies and additional reference materials developed from the CSMEP and PNAMP processes. To ensure compatibility with other regional and basin wide projects that are underway we will coordinate our activities with multiple disciplines and agencies throughout the Okanogan River basin, Columbia Cascade Province, and Columbia River Basin. To remain flexible to changes that might develop from the on-going work of the groups mentioned above, we plan to complete a protocol manual for all field tested protocols.

Level of Effort: Mostly a subcontracted work element through KWA.

**Metrics:** <None>

**Deliverable Specification:** The field protocol manual will contain the specific methodologies needed to duplicate data collected as part of this project with a minimum of experimental error associated with data collection. Final protocol manual will be the primary focus of this project in future years.

Milestone Title	Start Date	End Date	Status	Milestone Description
Update and modify biological protocols	3/1/2006	12/1/2006	Inactive	Field protocols will be updated after field testing and data collection and modified as needed to improve clarity and maintain consistency with other regional efforts.
Update and modify water quality protocols	3/1/2006	12/1/2006	Inactive	Field protocols will be updated after field testing and data collection and modified as needed to improve clarity and maintain consistency with other regional efforts.
Update and modify Physical Habitat Protocols	3/1/2006	12/1/2006	Inactive	Field protocols will be updated after field testing and data collection and modified as needed to improve clarity and maintain consistency with other regional efforts.
<b>Deliverable: Field Protocol Manual completed</b>		2/28/2007	Inactive	<i>See the Deliverable Specification above</i>

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

**Title:** Environmental Compliance

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

Estimated Level of Effort: 2 fisheries biologist for 0.63 months.



**Metrics:** <None>

**Deliverable Specification:** Documentation and assistance to support BPA's Environmental Compliance Group (such as maps, design drawings, survey reports, permit applications, ESA documents, etc.). Will vary based on the type of activity.

Milestone Title	Start Date	End Date	Status	Milestone Description
Receive NEPA/ESA clearance from BPA for FY2006 work	3/1/2006	3/31/2006	Inactive	Most activities have no negative impacts of endangered summer steelhead or bull trout therefore HIP BIOP should cover most activities. Extremely low likelihood of encountering bull trout, so no consultation with USFWS necessary.
Complete/submit HPA and shorelines applications	8/1/2006	12/1/2006	Inactive	HPA and shoreline permits are expected to be needed only for the Smolt trapping activities Work in 2006 will be designed to help secure 2007 permits.
Complete modification needed for section 10 permit to conduct smolt trapping	10/1/2006	2/28/2007	Inactive	Section 10 permit number 1540 is good until 2010. Extremely low likelihood of encountering bull trout, so no consultation with USFWS necessary.
Receive permits needed to complete smolt trapping work	10/1/2006	2/28/2007	Inactive	Receive shorelines and HPA permits
Submit FY2007 SOW to Kimberly for NEPA/ESA review	12/1/2006	2/28/2007	Inactive	
<b>Deliverable: Applicable permits and other environmental clearances received</b>		2/28/2007	Inactive	<i>See the Deliverable Specification above</i>

C: 185. Produce Pisces Status Report

**Title:** Quarterly status reports in Pisces

**Description:** Prepare and submit status report, including metrics, to COTR via Pisces not more than 15 days after the end of the quarter. Estimated level of effort is 1 biologist for 0.25 months.

**Metrics:** <None>

**Deliverable Specification:**

Milestone Title	Start Date	End Date	Status	Milestone Description
Jan-Mar 2006	4/1/2006	4/15/2006	Inactive	
Apr-Jun 2006	7/1/2006	7/15/2006	Inactive	
Jul-Sep 2006	10/1/2006	10/15/2006	Inactive	
Oct-Dec 2006	1/1/2007	1/15/2007	Inactive	
Final Status Report	2/21/2007	2/28/2007	Inactive	

C: 132. Produce Annual Report

**Title:** Produce annual report based on tasks identified within this scope of work

**Description:** Develop annual report that documents the elements described in and generated from items contained in this scope of work.

Estimated Level of Effort: 3 fisheries biologist for 0.33 months.

**Metrics:** <None>



- Deliverable Specification:** Report will address:
- Infrastructure development. How well are the major components of the system coming up to speed?
  - Sampling design and implementation (e.g., site selection, access permissions, first sampling of EMAP sites).
  - Protocol development, testing, and refinement. QA/QC processes.
  - Personnel hiring and training [sufficient staffing/skills in time; quality of data (big emphasis on QA/QC in first year)].
  - Database development (from data entry through report generation).
  - Hardware/software procurement, deployment, and serviceability (e.g., traps, weirs, video counting systems, handheld data recorders, etc.)

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

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

Milestone Title	Start Date	End Date	Status	Milestone Description
Draft Annual report for technical and co-manager review	3/1/2006	5/1/2006	Inactive	For project activities from 3/05 through 2/06
Revise in response to reviews received	5/15/2006	6/1/2006	Inactive	Incorporating any comments from COTR.
<b>Deliverable: Submit Final Annual Report to BPA COTR for posting</b>		6/1/2006	Inactive	<i>See the Deliverable Specification above</i>

D: 119. Manage and Administer Projects

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

Estimated Level of Effort: 1 fisheries biologist, 1.4 months; Staff assistant 5.0 months.

**Metrics:** <None>

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

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





Milestone Title	Start Date	End Date	Status	Milestone Description
Provide June accrual estimate to BPA	6/1/2006	6/20/2006	Inactive	
Provide September accrual estimate to BPA	8/20/2006	9/20/2006	Inactive	As requested by BPA.
Provide BPA with 2007 SOW, budget, etc.	11/1/2006	12/1/2006	Inactive	90 days in advance of contract end date.
<b>Deliverable: Deliverables as stipulated by BPA</b>		2/28/2007	Inactive	<i>See the Deliverable Specification above</i>

E: 118. Coordination

**Title:** Project coordination/public outreach

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

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

Sobcontract with KWA (outside of Okanogan) and ONA(in canada) to provide support as needed for this task

Estimated Level of Effort: Fishery Biologist for 1.85 months, Staff Assistant for 2 months

**Metrics:** <None>

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

Milestone Title	Start Date	End Date	Status	Milestone Description
Attend Regional Coordination Meetings	3/1/2006	2/28/2007	Inactive	Conduct coordination with regional M&E entities. We anticipate at least one meeting per month. Periodic RTT meetings when a presentation is requested. Upper Columbia Annual Pre-season Field Coordination Meeting.
Contact landowners for rotating panel to be sampled in 2006	3/1/2006	2/28/2007	Inactive	Contact private landowners and secure permission for EMAP sampling sites.
<b>Deliverable: Coordination efforts will be described in the Annual Report</b>		2/28/2007	Inactive	<i>See the Deliverable Specification above</i>

F: 160. Create/Manage/Maintain Database

**Title:** Complete, manage, and maintain database



**Description:** To summarize data management activities to date, a database for this project was just completed in late 2005 to support ongoing collection of field data in the Okanogan basin and a limited status and trend analysis. The sampling protocols have mostly been defined but many data analysis questions remain for future development. Thus far, data have been collected and hand entered into paper forms in the field. Beginning in year 2005 field season, data was collected electronically using hand-held data collectors. All field data requires migration into the OBMEP database and the new format.

In addition, past efforts to assemble an extensive collection of aquatic data supporting trend analysis will require inclusion into the OBMEP database. These data are in a variety of formats. Selected portions of these data will need to be ingested into a database structure to make it available for further comparison and consideration in analysis. The data may be in nearly any physical format (database, table, scanned image, paper, graph, etc.) yet will need to be merged into one common database system.

Subcontract with KWA to provide the primary deliverables for this work element.

Estimated Level of Effort: 3 Fishery Biologists for 0.3 months, 1 Field Technician for 0.5 months (Labor time is primarily related to data entry and input). This task is primarily supported using sub-contracted labor and expertise.

**Metrics:** <None>

**Deliverable Specification:** Migration of data from 2004 and 2005 field systems and critical historic data identified by the Colville Tribes and other agencies working in the Okanogan sub-basin into the database developed in 2005. In addition, the primary OBMEP database will require modifications and updating to maintain the integrity of the database and effectively assimilate collected data.

The OBMEP Monitoring Database system has been developed to include the following:

- Item 1. Tables, forms, and queries designed for import of field data.
- Item 2. Forms and procedures for import of existing field data and data from hand-held data collectors into the OBMEP Monitoring Database.
- Item 3. Training of CCT staff in database use, use of handheld data collectors, and import of existing field data into OBMEP database.
- Item 4. Database for import of bibliographic information on contents of historical data repository.
- Item 5. Import of data from historical data repository into the OBMEP Monitoring Database as-needed.
- Item 6. Standardized course output routines for export of data from the OBMEP Monitoring Database for well-defined output needs such as identified by the CCT, NOAA Fisheries, BPA, and other fish and wildlife managers.

On-going operational maintenance is required because most computer systems and technology evolve and so must this database to keep pace.



Milestone Title	Start Date	End Date	Status	Milestone Description
Migration of 2004 and 2005 data into database	3/1/2006	6/30/2006	Inactive	
Migration of historical data into database	6/1/2006	2/28/2007	Inactive	
Training and support of CCT staff in database use, hand-held data collectors, and data migration	3/1/2006	2/28/2007	Inactive	
Modify and update database as needed	3/1/2006	2/28/2007	Inactive	
Develop customized output routines	3/1/2006	2/28/2007	Inactive	
<b>Deliverable: Migration of data from 2004 &amp; 2005 field seasons and critical historic data</b>		2/28/2007	Inactive	<i>See the Deliverable Specification above</i>

**G: 70. Install Fish Monitoring Equipment**

**Title:** Design, build, and install picket-weir traps

**Description:** Inkameep Creek has had a recreational and subsistence fishery for many years for large spring migrating *O. mykiss*. However, the Canadian government agencies have never determined the true origin of the *O. mykiss* that make up this fishery. To determine if these fish are anadromous steelhead or adfluvial rainbow trout from Lake Osoyoos will require trapping a majority of the run and collecting DNA samples from these fish. The Okanogan Nation Alliance are committed to processing all the DNA samples but lack the infrastructure to collect fish effectively.

OBMEP is attempting to enumerate adult steelhead migrations into all the tributaries of the Okanogan River basin either using video counts or by capturing the fish in traps. Expansion of a locally-adapted brood stock collection program would benefit if steelhead are utilizing Inkameep Creek in good numbers and provide potentially important genetic material for the recovery of summer steelhead in Canada. Installation of this trap would be collaborative with ONA and future cost would be shared among other projects.

Some staff time under this work element will likely be spent helping to install a trap in Omak Creek and possibly a trap in Bonaparte Creek as these data are collected and shared cooperatively between several projects. This project mainly supports labor, equipment, and technical assistance; other projects are responsible for all applicable permits (i.e. section 10 permit number 1520 for Omak Creek locally adapted broodstock) and costs for the trap will be picked up by other projects.

Estimated Level of Effort: 1 fisheries biologists for 0.25 months and 1 fisheries technician for 0.5 month.

**Metrics:** <None>

**Deliverable Specification:** Installation of traps and weirs needed to support multiple agency needs and provide a full enumeration of adult summer steelhead into select tributaries in the Okanogan River basin.



Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	3/1/2006	3/31/2006	Inactive	This should not be a major issue as <i>O. mykiss</i> are not a listed species in Canada but collecting these data could lead to listing in the future and any other traps will be permitted by other projects.
Design and fabricate trap, tripods, and pickets	3/1/2006	4/1/2006	Inactive	
Install Trap into Inkameep Creek, Omak and other creeks	3/15/2006	4/15/2006	Inactive	Have trap installed and operational by the end of April at the latest to enumerate spring returns in 2006
Remove and store picket weir and trap	6/15/2006	6/30/2006	Inactive	
<b>Deliverable: Monitoring trap/weir/station in-place and fully functional.</b>		6/30/2006	Inactive	<i>See the Deliverable Specification above</i>

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

**Title:** Enumerate adult anadromous fish from select sites throughout the Okanogan subbasin

**Description:** Collect data on adult anadromous fish entering into Osoyoos Lake through the Zosel Dam fishways and into select tributaries such as Nine-mile Creek, Bonaparte Creek, and Salmon Creek using video counting technology. The Zosel dam site will operate year round until such time as sufficient data are collected to determine times when no counting can occur without missing adult anadromous fish. Tributaries will be monitored from March 15 until June 15 on tributaries with no data or for a period beginning two weeks before fish are known to migrate into the tributary to a date two weeks after the last fish is known to migrate into the tributary. Tributary counts are primarily designed to collect information on summer steelhead although information on all migratory species will be collected. Adult video enumeration will be compared with redd surveys to determine if one methodology can be used as a suitable surrogate for the other in the future. Video equipment was designed and installed for this project in 2005.

Subcontracts with ONA to operate Inkameep trap, and with LGL for design, evaluation, and operationa support for video equipment

Estimated Level of Effort: 3 Biologists for 3 months, 4 technicians for 9 months.

**Metrics:**

- \* R, M, and E Focal Area [Tributaries, Hydrosystem, Estuary, Ocean, Harvest, Hatchery, Systemwide, Emerging Issues]
- \* Primary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]
- \* Secondary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]

**Deliverable Specification:** We installed video cameras at Zoesel Dam for adult enumeration in 2005 and will install portable video counting stations in 3 tributaries in 2006. Adult summer steelhead will be enumerated at all sites and other species encountered will also be enumerated along with any external marks. Data will be stored on proprietary harddrives until reviewed, numeric data will then be stored on the OBMEP server and distributed as appropriate. Additional data will be collected to complete adult enumeration on Bonaparte, Omak, and Inkameep creeks through trapping efforts and cooperative agreements developed as part of work element H and work element P.



Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	3/1/2006	3/31/2006	Inactive	CX completed by BPA mid-March.
Collect data, operate, and maintain Zosel dam video counting station	3/1/2006	2/28/2007	Inactive	Clean, maintain, modify, and change video equipment at Zosel Dam video counting station to ensure a complete and accurate count of all anadromous fish using the Zosel Dam fishways is completed in 2006.
Install video counting stations on 3 tributaries to the Okanogan River	3/1/2006	3/15/2006	Inactive	Clean, maintain, modify, and change video equipment at tributary locations to ensure a complete and accurate count of summer steelhead is completed in 2006. Preliminary tributaries are Nine-mile, Antoine, and Salmon Creeks but these are subject to change based on stream flows or land ownership issues.
Collect data, operate, and maintain select tributary video counting stations	3/15/2006	6/15/2006	Inactive	Clean, maintain, modify, and change video equipment at tributary locations to ensure a complete and accurate count of summer steelhead is completed in 2006. Preliminary tributaries are Nine-mile, Antoine, and Salmon Creeks but these are subject to change based on stream flows or land ownership issues. Enumeration will also occur at Inkameep, Omak and Bonaparte creeks. Enumerate all fish passively.
Evaluate efficiency and modify as necessary	3/15/2006	6/15/2006	Inactive	Repair, modify and monitor as needed.
Remove tributary video counting stations and securely store equipment	6/15/2006	7/1/2006	Inactive	Dismantle, remove, clean, maintain, modify, and change video equipment at tributary locations.
<b>Deliverable: Data on adult anadromus fish passing select locations in the Okanogan subbasin</b>		2/28/2007	Inactive	<i>See the Deliverable Specification above</i>

I: 175. Produce Design and/or Specifications

**Title:** Design Malott video counting weir

**Description:** A fish counting weir near Malott, Washington would provide a mechanism to get a complete escapement count into the Okanogan River basin. At present the only count available is at Wells Dam, This cannot clearly determine what portion of the run goes to the Methow River, Okanogan River, or remains in the main-stem Columbia River. In 2005, feasibility studies were conducted and based on these options regional biologists will select the option they feel is most likely to provide a census count for adult anadromus fish into the Okanogan River. The selected option will be refined to the 50% design level and future funding will be pursued through the 2007 BPA process for final design and construction.

Subcontract with LGL. Estimated Level of Effort: Fishery biologist for 0.25 months, and Fisheries technician for 0.5 months. Primary effort will be sub-contracted.

**Metrics:** <None>

**Deliverable Specification:** Conceptual designs will be used to select one option for 50% preliminary design and future funding pursued through the 2007 Council solicitation.



Milestone Title	Start Date	End Date	Status	Milestone Description
Conceptual design complete and finalize location	3/1/2006	9/30/2006	Inactive	
Complete 50% design alternative	6/1/2006	2/28/2007	Inactive	
<b>Deliverable: Peiliminary design report for Malott fish counting facility</b>		2/28/2007	Inactive	<i>See the Deliverable Specification above</i>

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

**Title:** Operate & maintain real-time discharge, water temperature gauging stations in the Okanogan subbasin

**Description:** Collect, verify, and post discharge, temperature, and water quality data at DOE and USGS real-time gauging stations throughout the Okanogan Basin using a satellite uplink. Real-time data collection at gauging stations is critical to fisheries and regulatory agencies. The Okanogan River watershed has several tributaries that provide little information on discharge or temperature but these parameters are known to be limiting in several tributaries throughout the Okanogan River basin. By expanding the existing suite of gauging station sites, considerable additional data can be collected with on-going operation and proper maintenance.

Estimated Level of Effort: 1 fishery biologist, 1.38 months and 1 office assisstant for 2-months plus sub-contracts with USGS for U.S. station and ONA for Canadian effort through Environmetal Canada.

**Metrics:**

- \* R, M, and E Focal Area [Tributaries, Hydrosystem, Estuary, Ocean, Harvest, Hatchery, Systemwide, Emerging Issues]
- \* Primary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]
- \* Secondary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]

**Deliverable Specification:** This project provides support for both real time discharge and water temperature data through Environment Canada at Inkameep Creek, Shuttleworth Creek, and Vassuex Creek, and real-time water temperature data at USGS stations located along the Okanogan River mainstem at Oroville, Tonasket, and Malott, WA. An additional near real time station for discharge and temperature will be installed under work element L on Nine-mile Creek, and once installed, this work element will provide for ongoing O&M. First year O&M is expected to only be for 5 months after installation in October 2006.

These data are accessible through the following web-sites;

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



Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	3/1/2006	3/31/2006	Inactive	CX and HIP BO completed by BPA mid-March.
Develop agreements with Environment Canada and USGS to operate and maintain gauging stations	3/1/2006	10/30/2006	Inactive	Develop the contract or agreements to install, operate, and maintain water quality gauging sites that monitor both temperature and discharge in the Okanogan drainage.
Collect and post data collected at DOE, Environment Canada and USGS gauging stations	3/1/2006	2/28/2007	Inactive	Collect and post data collected at DOE, Environment Canada, and USGS gauging stations throughout the Okanogan River basin
Operate and maintain stream gauging sites	4/30/2006	2/28/2007	Inactive	On-going cost associated with operating expanded sites.
<b>Deliverable: Web accessible data for discharge, temperature and other water quality parameters</b>		2/28/2007	Inactive	<i>See the Deliverable Specification above</i>

**K: 148. Install Flow Measuring Device**

- Title:** Install one real-time stream gauging station on Nine-Mile Creek
- Description:** This gauging station was supposed to be done in 2005 but was changed to Inkameep Creek in Canada due to difficulties on Nine-Mile. Estimated Level of Effort: Sub contracted only (USGS).
- Metrics:** Is the measuring device portable or fixed?
- Deliverable Specification:** One real-time gauging site capable of measuring discharge and temperature installed on Nine-mile Creek.

Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	3/1/2006	3/31/2006	Inactive	CX and HIP BO completed by BPA mid-March.
<b>Deliverable: Flow measuring device installed</b>		10/1/2006	Inactive	<i>See the Deliverable Specification above</i>

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

- Title:** Collect continous water temperature data from 35 to 40 sites throughout the Okanogan River basin
- Description:** Water temperature is a critical limiting factor identified for the Okanogan River, therefore, it is important to understand temperature as it relates to anadromous fish throughout the Okanogan River basin. To properly measure changes in temperature over time requires highly detailed continous temperature monitoring. The use of electronic technology allows continous monitoring of water temperature at a multitude of sites, both technically and economically practical. Sites will be located at EMAP sites located in tributaries while mainstem monitoring will occur only at stream gauging stations under work element K.
- Subcontract with ONA for data from 12-16 sites in Canada  
 Estimated Level of Effort: 2 Biologists for 1.25 months, 1 Technician for 3 months.
- Metrics:**
- \* R, M, and E Focal Area [Tributaries, Hydrosystem, Estuary, Ocean, Harvest, Hatchery, Systemwide, Emerging Issues]
  - \* Primary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]
  - \* Secondary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]



**Deliverable Specification:** Temperature data will be collected continuously (once per hour) from October of 2005 to October of 2006 at the year-2 panel, tributary EMAP locations and at USGS sites along the Okanogan River main-stem. Then in October of 2006, data loggers will be moved to the year-3 panel sites. Data loggers will be monitored and downloaded once per 3 months, at all 35 to 40 water quality data collection sites. Half of the sites are rotating, the other half are permanent annual sites. The original 50 EMAP sites were reduced after reviewing long-term data sets collected along the Okanogan River main-stem (2004 annual report). These data showed that little additional information would be gained by collecting this data at multiple sites along the main-stem beyond what has been collected at already established monitoring sites.

Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	3/1/2006	3/31/2006	Inactive	CX and HIP BO completed by BPA mid-March.
Download data from January 2006 to present	3/1/2006	3/31/2006	Inactive	Data will be downloaded from electronic data logger once every quarter to protect against data lost from equipment malfunction or loss.
Download data from April 2006 to present	6/1/2006	6/30/2006	Inactive	Data will be downloaded from electronic data logger once every quarter to protect against data lost from equipment malfunction or loss.
Download data from July 2006 to present and relocate panel sites	10/1/2006	10/31/2006	Inactive	Data will be downloaded from electronic data logger once every quarter to protect against data lost from equipment malfunction or loss. Water temperature data is collected for a water year that begins in October and ends in October for each year. Rotating panel sites will be relocated at this time.
Download data from October 2006 to present	3/1/2006	2/28/2007	Inactive	Data will be downloaded from electronic data logger once every quarter to protect against data lost from equipment malfunction or loss. Winter data collection is contingent on weather and ice condition at each site.
<b>Deliverable: Continous water temperature data from 35 to 40 randomly selected sites</b>		2/28/2007	Inactive	<i>See the Deliverable Specification above</i>

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

**Title:** Collect instantaneous water quality data from 35 to 40 sites throughout the Okanogan River basin

**Description:** Water quality data such as pH, dissolved oxygen, turbidity, and conductivity can be important to both fisheries managers and regulators; therefore this information will be monitored and made available to other managers and agencies through the web and project specific server or through Stream-net. Samples will be collected up to 3 times per month at between 35 and 40 tributary EMAP sites while mainstem information will only be collected at stream gauging stations along the main-stem Okanogan and Similkameen rivers. Water quality data will be collected using Eureka electronic probes following OBMEP and manufacture protocols.

Subcontract with ONA for data from 12-16 sites in Canada

Estimated Level of Effort: 2 fishery biologist, 1.5 months, 1 fishery technician for 6.63 months.

**Metrics:**

- \* R, M, and E Focal Area [Tributaries, Hydrosystem, Estuary, Ocean, Harvest, Hatchery, Systemwide, Emerging Issues]
- \* Primary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]
- \* Secondary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]





**Deliverable Specification:** Water quality data will consist of dissolved oxygen, turbidity, conductivity, pH and others as deemed necessary. These data will be collected up to 3 times per month at selected EMAP sites within the Okanogan River drainage, and will be stored on OBMEP server. Water quality data will be collected by hand using Eureka electronic probes following OBMEP and manufacturer protocols. The original 50 EMAP sites were reduced after reviewing long-term data sets collected along the Okanogan River main-stem (2004 annual report). These data showed that little additional information would be gained by collecting this data at multiple sites along the main-stem beyond what is has been collected at already established monitoring sites.

Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	3/1/2006	3/31/2006	Inactive	CX and HIP BO completed by BPA mid-March.
25% of samples completed	3/1/2006	6/1/2006	Inactive	25% of water quality samples collected
50% of samples completed	6/1/2006	9/1/2006	Inactive	50% of water quality samples collected
75% of samples completed	9/1/2006	12/1/2006	Inactive	75% of water quality samples collected
100% of samples completed	12/1/2006	2/28/2007	Inactive	100% of water quality samples collected
<b>Deliverable: Instantaneous water quality data from 35 to 40 randomly selected EMAP sites</b>		2/28/2007	Inactive	<i>See the Deliverable Specification above</i>

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

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

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

Physical habitat data will be collected under pre-established protocols at 25 annual and 25 rotating sampling sites per EMAP GRTS six panel sampling design. The 25 rotating panel sites change every year until after the fifth year when you return to the first panel. All panel sites will likely require monumenting prior to the physical habitat surveys after a five year period (site verification and monumenting for annual sites was completed in 2004). Physical habitat data will be collected on Trimble GPS data loggers. Information will be collected pertaining to presence and composition of large woody debris; riparian vegetation structure; canopy cover; human disturbance; substrate composition; embeddedness; side channel habitat; stream channel habitat types (pool, riffle, glide, etc.) and channel widths and depths.

Subcontract with ONA for 16 sites located in Canada.

Estimated Level of Effort: 3 Biologists for 3 months, 4 Technicians for 7.63 months.

**Metrics:**

- \* R, M, and E Focal Area [Tributaries, Hydrosystem, Estuary, Ocean, Harvest, Hatchery, Systemwide, Emerging Issues]
- \* Primary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]
- \* Secondary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]

**Deliverable Specification:** Physical habitat data will be collected at 50 (25 annual panel, 25 rotating panel) EMAP sampling sites consistent with Upper Columbia Monitoring and Evaluation Strategy protocols as adopted by the Okanogan Basin Monitoring and Evaluation Program. Physical habitat data from up to 50 EMAP sampling sites will be stored on the OBMEP server located at the Colville Tribe's Fish and Wildlife office in Omak, WA, and forwarded to NMFS.



Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	3/1/2006	3/31/2006	Inactive	CX and HIP BO completed by BPA mid-March.
Physical Habitat Surveys of about 20 sites	6/1/2006	7/31/2006	Inactive	Collection of physical habitat data under pre-established regionally accepted protocols at sites 1-20
Physical Habitat Surveys of about 20 sites	8/1/2006	8/31/2006	Inactive	Collection of physical habitat data under pre-established regionally accepted protocols at sites 21-40
Physical Habitat Surveys of about 10 sites	9/1/2006	10/30/2006	Inactive	Collection of physical habitat data under pre-established regionally accepted protocols at sites 41-50
<b>Deliverable: Physical habitat data from 50 sites</b>		11/30/2006	Inactive	<i>See the Deliverable Specification above</i>

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

**Title:** Conduct steelhead redd counts from index sites throughout the Okanogan River subbasin



**Description:** Collect data on steelhead redds in the Okanogan subbasin. Steelhead redd surveys will all be done following protocols established by the Colville Confederated Tribes and contributors as identified in work element A. There will be a high level of coordination with planners, permittees and other data collection agencies to achieve the best data available. Redd survey reaches were established after collecting data in 2005 (Arterburn et al. 2005). The reaches on the US portion of the Okanogan main-stem Okanogan River are:

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

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

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

The following creeks are limited by private property permission issues:

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

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

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

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

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

Other tribal efforts will provide monitoring of steelhead redds in Stapaloop Creek and these data will be shared. Other tributaries such as Loop-loop, and Salmon creeks will be included in the future once passage issues have been addressed.

Subcontract with ONA to conduct redd surveys on Main-stem Okanogan and establish reference reaches, Inkameep Creek from Falls downstream to confluence, Vassuex Creek from barrier downstream to the confluence, and other tributary streams that anadromous fish might have access to as deemed suitable by the ONA and Colville Tribes.

Estimated Level of Effort: Redd surveys- 1-Biologist for 3 months, 1 technician for 1 month.



**Metrics:** \* R, M, and E Focal Area [Tributaries, Hydrosystem, Estuary, Ocean, Harvest, Hatchery, Systemwide, Emerging Issues]  
 \* Primary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]  
 \* Secondary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]

**Deliverable Specification:** These data will be stored on the OBMEP server located at the Colville Tribes, Fish and Wildlife Department offices in Omak, WA.

Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	3/1/2006	3/31/2006	Inactive	CX and HIP BO completed by BPA mid-March.
Mobilize equipment and conduct first pass main-stem redd counts	3/15/2006	4/1/2006	Inactive	Dates for surveys established from redd survey efforts conducted in 2005 as part of this project.
Conduct second pass main-stem redd counts	4/1/2006	4/15/2006	Inactive	Dates for surveys established from redd survey efforts conducted in 2005 as part of this project.
Conduct third pass main-stem redd counts	4/15/2006	4/30/2006	Inactive	Dates for surveys established from redd survey efforts conducted in 2005 as part of this project.
Conduct tributary redd surveys and demobilize equipment	5/1/2006	6/1/2006	Inactive	Dates for surveys established from redd survey efforts conducted in 2005 as part of this project.
<b>Deliverable: Abundance and distribution data on summer steelhead redds in the Okanogan subbasin</b>		6/30/2006	Inactive	<i>See the Deliverable Specification above</i>

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

**Title:** Smolt trapping for data on outmigrating anadromous fish from the Okanogan River subbasin

**Description:** Collect rotary screw trap data on summer/fall Chinook smolts and juvenile summer steelhead outmigrating from the Okanogan River subbasin. Smolt trapping will be done following protocols established by the Colville Confederated Tribes and other regional contributors as identified in work element A. There will be a high level of coordination with planners, permittees and other data collection agencies to achieve the best data available at the least impact to endangered summer steelhead. Permits will be in place prior to any instream fish collection.

Smolt trap is located at the confluence of Okanogan and Loop-loop Creek, in the lower portion of the Okanogan River, below most of the spawning activity in the Okanogan basin. Section 10 permit authorizes up to two traps at this location.

Subcontract with LGL to assist with mobilization and demobilization of the rotary screw trap(s)  
 Estimated Level of Effort: Smolt trapping- 3 Biologists for 4.5 months, 3 technicians for 9 months

**Metrics:** \* R, M, and E Focal Area [Tributaries, Hydrosystem, Estuary, Ocean, Harvest, Hatchery, Systemwide, Emerging Issues]  
 \* Primary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]  
 \* Secondary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]



**Deliverable Specification:** Data on abundance of outmigrating juvenile summer steelhead and summer/fall Chinook smolts will be the primary target although information on other anadromous fish species and any external marks or tags will also be collected from fish leaving the Okanogan River subbasin. Bismark brown stain for the first 50 juveniles captured each day for use in mark-recapture estimates used to develop trap efficiency estimates. We will be installing, testing, and operating up to 2 smolt traps in one location on the Okanogan River. These data will be stored on the OBMEP server located at the Colville Tribes, Fish and Wildlife Department offices in Omak, WA.

Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	3/1/2006	3/31/2006	Inactive	Section 10 permit number 1540 is in place until 2010. County shorelines and state HPA and scientific collection permits will be secured annually from the appropriate agency as part of Work element B.
Mobilize, install, and test smolt trapping equipment	3/1/2006	3/15/2006	Inactive	Mobilize, design, and purchase trapping equipment; plan, deploy, and attach trap to hwy 20 bridge, test and position trap for HWY 20 bridge location, test trap efficiency, train staff, and begin operations.
Operate, maintain and collect data from smolt traps	3/15/2006	7/15/2006	Inactive	Operate and collect data from smolt traps every other day. Enumerate all smolts and bismark brown stain smolts.
Demobilize smolt trapping equipment and store securely	7/15/2006	8/1/2006	Inactive	Demobilize equipment (trap, trailer etc..) and store in a secure area until needed next year.
<b>Deliverable: Data on outmigrating smolts and parr from the Okanogan River subbasin</b>		8/30/2006	Inactive	<i>See the Deliverable Specification above</i>

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

**Title:** Snorkel for data on juv summer steelhead abundance at EMAP sites throughout the Okanogan subbasin

**Description:** Collect data on juvenile summer steelhead relative abundance at 50 EMAP sites randomly selected from the Okanogan River and tributaries. Snorkeling surveys will all be done following protocols established by the Colville Confederated Tribes and other regional contributors as identified in work element A. There will be a high level of coordination with planners, permittees and other data collection agencies to achieve the best data available.

Sub-contract with ONA for 16 canadian sites.

Estimated Level of Effort: Snorkeling- 3 Biologists for 3.5 months, 3 technicians for 1 month.

**Metrics:**

- \* R, M, and E Focal Area [Tributaries, Hydrosystem, Estuary, Ocean, Harvest, Hatchery, Systemwide, Emerging Issues]
- \* Primary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]
- \* Secondary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]

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



Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	3/1/2006	3/31/2006	Inactive	CX and HIP BO completed by BPA mid-March.
Mobilize equipment and snorkel training	7/1/2006	7/15/2006	Inactive	Purchase, prepare equipment, and train field staff on fish identification and specific protocols
Snorkeling	7/15/2006	10/1/2006	Inactive	Snorkeling at 50 EMAP sites (25 annual, 25 rotating panel) looking for adult and juvenile anadromous fish.
Demobilize, repair, and securely store snorkeling equipment	10/1/2006	10/31/2006	Inactive	Demobilize, repair, and store snorkeling equipment.
<b>Deliverable: Data on juvenile summer steelhead abundance at all EMAP locations</b>		11/30/2006	Inactive	<i>See the Deliverable Specification above</i>

R: 156. Develop RM&E Methods and Designs

**Title:** Conduct pilot study to determine best methods and indexes for macroinvertebrates

**Description:** Regional guidance is lacking and no consensus for methodologies or indices can be determined within the state, region, or nation. To move forward in the Okanogan basin requires us to first determine if methods used in other areas (i.e. Canadian Ministry of the Environment, Washington Department of Ecology, or others) can be adapted to other reaches within the Okanogan River subbasin. To determine this we will collect data on macro invertebrates from portions of the U.S. Okanogan and Similkameen rivers and selected tributaries to evaluate the use of pre-existing indices developed for the Canadian portions of the Okanogan and Similkameen Rivers, and select tributaries.

Macro invertebrate sampling will all be done following protocols established by the Colville Confederated Tribes and other regional contributors as identified to evaluate this work. There will be a high level of coordination with planners, permittees and other data collection agencies to achieve the best data available. This is a pilot project to help determine the feasibility of conducting long-term future data collecting of Macro-invertebrates throughout the Okanogan River basin.

Estimated Level of Effort: Macro invertebrate sampling: 1 Biologist for 0.25 months, 1 technician for 0.25 months; covers sample collection only, sample processing and analysis will be covered by subcontractor.

**Metrics:** <None>

**Deliverable Specification:** Macro invertebrate report on how best to proceed in the future for collecting long-term status and trend data related to macro invertebrates for the entire Okanogan River subbasin. These data will be stored on the OBMEP server located at the Colville Tribes, Fish and Wildlife Department offices in Omak, WA.

Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	3/1/2006	3/31/2006	Inactive	CX and HIP BO completed by BPA mid-March.
Mobilize equipment and conduct field staff training	9/1/2006	9/30/2006	Inactive	Purchase equipment, assemble needed gear, and train feild staff
Complete Macro Invertebrate Sampling and securely store equipment	10/1/2006	10/31/2006	Inactive	Complete macro invertebrate surveys.
<b>Deliverable: Macro invertebrate report and collected data</b>		12/31/2006	Inactive	<i>See the Deliverable Specification above</i>

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



**Title:** Generate observational data for summer steelhead fry to aid in understanding seasonal movements

**Description:** Summer steelhead were observed spawning in the main-stem Okanogan River through this project in 2005. As a result of these observations, questions about summer steelhead fry survival have emerged. Currently no information is available therefore an effort to observe movements from spawning areas to rearing areas is important given that the Okanogan River is known to exceed the thermal tolerances for juvenile summer steelhead during the months of July and August. Snorkel surveys in September of 2005 observed zero juveniles present in the Okanogan or Similkameen River main-stems. Work element Q will provide information if fish migrate out of the Okanogan River system and work element O will provide evidence if fish are observed entering Osyoos Lake. However, if these fish remain in the areas near where they are hatched it will be important to observe their movements. Snorkeling will be the primary methodology attempted unless visual distances are very limited, then seining might be used. This information will help in making better management decisions and for developing better planning documents that help speed recovery of listed summer steelhead.

Estimated Level of Effort: 3 Fisheries Biologist for 1 month.

**Metrics:**

- \* R, M, and E Focal Area [Tributaries, Hydrosystem, Estuary, Ocean, Harvest, Hatchery, Systemwide, Emerging Issues]
- \* Primary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]
- \* Secondary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]

**Deliverable Specification:** Data on location and quantity of summer steelhead juveniles observed in select index areas (Similkameen River and Okanogan River below Zosel Dam). These data will be stored on the OBMEP server located at the Colville Tribes, Fish and Wildlife Department offices in Omak, WA.

Milestone Title	Start Date	End Date	Status	Milestone Description
Environmental compliance requirements complete	3/1/2006	3/31/2006	Inactive	CX and HIP BO completed by BPA mid-March.
Snorkel surveys to confirm presence of fry in the mainstem	6/1/2006	7/14/2006	Inactive	
<b>Deliverable: Baseline data on summer steelhead fry movements between spawning and rearing areas</b>		7/15/2006	Inactive	<i>See the Deliverable Specification above</i>

T: 156. Develop RM&E Methods and Designs

**Title:** Determine methodologies for collecting and analyzing remote sensed data in the Okanogan subbasin

**Description:** Preliminary efforts to collect remote sensed data compatible with the upper Columbia Strategy (Hillman 2004). GIS will be used to help communicate complex information in the most intelligible way possible.

KWA or other suitable sub-contractor will assist the Colville Tribes in developing a blue-print to follow related to these activities so this work can be done effectively in the future.

Estimated Level of Effort: 2 Fisheries Biologists for 1.08 months.

**Metrics:** <None>



**Deliverable Specification:** Data on a wide array of information collected to aid in salmon recovery and BPA mitigation activities and that can be used for status and trend monitoring over the long-term. These data will be stored on the OBMEP server located at the Colville Tribes, Fish and Wildlife Department offices in Omak, WA.

Develop the links to GIS data and develop layers for the Okanogan River subbasin that depict road density, riparian -road index, land ownership, and land use within the Okanogan subbasin drainage. Develop GIS layers for discrete locations of hatcheries, water treatment plants, point source pollution points, road crossings, diversion points, EMAP reaches, stream gauging station sites, water quality sites, index reaches, and other points of interest (i.e. locations well-suited for habitat improvement activities). Detailed notes should be kept as part of this process to develop protocols that can be incorporated with field methodologies as part of work element A.

Milestone Title	Start Date	End Date	Status	Milestone Description
Collect source data for remote sensing GIS layers	3/1/2006	10/1/2006	Inactive	Assemble GIS data to meet the needs of the Upper Columbia Strategy for remote sensed data collection activities.
Provide methodologies used in developing layers so future work can be standardized	10/1/2006	2/28/2007	Inactive	Notes from collection and analysis of data that will allow for a protocol to be developed that can be repeated in the future into protocols developed similar to Work element A for field data collection.
<b>Deliverable: Data compiled and GIS data layer created for long-term status and trend monitoring</b>		2/28/2007	Inactive	<i>See the Deliverable Specification above</i>

U: 162. Analyze/Interpret Data

**Title:** Analyze collected and historical data on habitat, biological, and water quality parameters

**Description:** Data gathered by the Colville Confederated Tribe and other agencies and individuals working in the Okanogan Basin will be synthesized and interpreted to confirm that all crucial data is being collected and that we will be able to draw conclusions from this data once a long-term data set is established. Additional analysis will occur as part of the annual report writing task as necessary.

KWA or other suitable sub-contractor will assist the Colville Tribes in developing appropriate analysis routines for evaluation of long-term data sets.

Estimated Level of Effort: 3 Fishery biologists for 4.35 months, 1 technician for 0.5 months.

- Metrics:**
- \* R, M, and E Focal Area [Tributaries, Hydrosystem, Estuary, Ocean, Harvest, Hatchery, Systemwide, Emerging Issues]
  - \* Primary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]
  - \* Secondary R, M, and E Type [Status and Trend Monitoring, Action Effectiveness Research, Uncertainties Research, Project Implementation/ Compliance Monitoring]

**Deliverable Specification:** We will gather data on habitat, water quality, and anadromous fish as defined in our protocols. We will then synthesize/summarize our collected data and data gathered by other agencies and individuals into usable summary tables and graphs. We may work with the EPA to analyze, interpret, and statistically test our collected data and then make decisions if we need different or more comprehensive data collection techniques in future years. After several years of data are compiled, status and trend analysis will begin (NMFS recommends minimum of 12 years of data for this analysis).





Milestone Title	Start Date	End Date	Status	Milestone Description
Analyze and interpret data	10/1/2006	2/28/2007	Inactive	Synthesize data collected to develop models, interpret results, and run statistical analysis.
<b>Deliverable: Data summaries of habitat, biological and water quality parameters</b>		2/28/2007	Inactive	<i>See the Deliverable Specification above</i>

V: 161. Disseminate Raw/Summary Data and Results

**Title:** Workshop/conference attendance and publication

**Description:** Workshops and conferences are periodically held by the American Fisheries Society, EPA, PNAMP, and other entities within the Columbia Basin. These workshops and conferences offer an important forum for information exchange between fisheries scientists. OBMEP biologists will attend these events and provide 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.

KWA or other suitable sub-contractor will assist the Colville Tribes in developing appropriate web-site content or presentation quality information to aid in information dissemination as directed by the Colville Tribes.

Estimated Level of Effort: 3 fishery biologists for 1.75 months.

**Metrics:** <None>

**Deliverable Specification:** Professional presentations, dissemination of raw data to interested parties, and networking with other R, M&E implementers. OBMEP staff biologists will periodically attend relevant workshops/conferences as scheduled within the region to exchange information with or provide presentations to other fisheries scientists.



Milestone Title	Start Date	End Date	Status	Milestone Description
Develop content, post data, and reports on OBMEP web-site	3/1/2006	2/28/2007	Inactive	Develop, maintain, and update a web-site of the activities of the OBMEP project.
EPA workshops for Bioassessment, large river monitoring, and EMAP analysis	3/1/2006	2/19/2007	Inactive	EPA has a wide variety of workshops throughout the year that provide opportunities to exchange data and programmatic information and network with other professionals specifically about EMAP, macro invertebrate monitoring, and large river data collection.
Western Division AFS Meeting in Bozeman Montana	5/15/2006	5/19/2006	Inactive	Present information about the OBMEP project at Western Division AFS meeting.
Attend practitioners workshops for PNAMP and other PNAMP meetings	3/1/2006	2/28/2007	Inactive	PNAMP is the regional coordination group for R, M&E activities in the Pacific Northwest. It is important to maintain an active roll with this group to maintain compatibility between programs collecting data and people attempting to roll-up data to a larger scale. The practitioner workshops bring together other project managers to share information and solutions to common problems or issues.
Attend RTT, Bilateral Okangoan workshop, and other regional R,M&E meetings	3/1/2006	2/28/2007	Inactive	Participate in regional forums on R, M&E including involvement with RTT monitoring and evaluation subcommittee, bilateral working group annual meeting to communicate with canadian agencies, host three meetings between ONA and CCT to exchange programmatic information between agencies.
<b>Deliverable: Presentations at workshops &amp; conferences, updated OBMEP website</b>		2/28/2007	Inactive	<i>See the Deliverable Specification above</i>

Contract #	Contract Title	Contractor	COTR
26654	2003-022-00 EXP MONITOR/EVAL OKANOGAN BASIN NATURAL PRODUCTION	Colville Confederated Tribes	Branum, Sarah

piAgreementRevisionID = X 7478 X

piSOWID = X X