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Pacific Northwest National Laboratory
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Facilitation of the Estuary/Ocean Subgroup and the Expert Regional Technical Group, Fiscal Year 2014 Annual Report

Final Report

GE Johnson

September 2014

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Pacific Northwest National Laboratory
Richland, Washington 99352

Preface

The project reported on herein covers facilitation of the Estuary/Ocean Subgroup (EOS) for federal research, monitoring, and evaluation (RME) and the Expert Regional Technical Group (ERTG) for estuary habitat restoration. The EOS is part of the RME effort that the Action Agencies (Bonneville Power Administration [BPA], U.S. Army Corps of Engineers [Corps], U.S. Bureau of Reclamation) developed in response to obligations arising from the Endangered Species Act as applied to operation of the Federal Columbia River Power System (FCRPS). The EOS is tasked by the National Marine Fisheries Service (NMFS) and the Action Agencies (AAs) to design and coordinate implementation of the federal RME plan for the lower Columbia River and estuary, including the river's plume in the ocean. Initiated in 2002, the EOS is composed of members from BPA, the Corps, NMFS, Pacific Northwest National Laboratory's (PNNL's) Marine Sciences Laboratory, and other agencies as necessary.

The ERTG assigns survival benefit units for ocean- and stream-type juvenile salmon from estuary habitat actions implemented by the AAs as called for in the 2008 Biological Opinion (BiOp) on FCRPS operations. The ERTG comprises members from the NMFS, Oregon Department of Fish and Wildlife, PNNL, Skagit River Cooperative, and Washington Department of Fish and Wildlife. The ERTG Steering Committee includes representatives from BPA, the Corps, and NMFS. Under the EOS/ERTG project, notes from ERTG meetings are compiled and reported as separate work products (see http://www.cbfish.org/EstuaryAction.mvc/Index).

The BPA contracted with PNNL to coordinate and facilitate the EOS and the ERTG (Contract No. 56065, release 3). This annual report is a fiscal year 2014 deliverable for the project titled Facilitation of the EOS and ERTG (BPA Project No. 2002-077-00 and PNNL Project No. 65387). Ben Zelinsky (503-230-4737) and Chris Read (503-230-5321) were BPA's contracting officer's technical representatives for this project. For more information about PNNL's conduct of this project, please contact the project manager, Gary Johnson (503-417-7567).

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Acknowledgments

Important contributions to the EOS and ERTG during fiscal year 2014 were made by Blaine Ebberts and Cindy Studebaker (Portland District, Corps); Julie Doumbia, Chris Read, and Ben Zelinsky (BPA); and, Lynne Krasnow (NMFS). Assistance from the following PNNL staff is much appreciated: Susan Ennor, Erin Nave, Jan Slater, and Ron Thom.

Acronyms and Abbreviations

AA	Action Agencies
BiOp	Biological Opinion
BPA	Bonneville Power Administration
CEERP	Columbia Estuary Ecosystem Restoration Program
Corps	U.S. Army Corps of Engineers
CREDDP	Columbia River Estuary Data Development Program
Council	Northwest Power and Conservation Council
EOS	Estuary/Ocean Subgroup
ERTG	Expert Regional Technical Group
FCRPS	Federal Columbia River Power System
ft	feet
FY	fiscal year
ISAB	Independent Scientific Advisory Board
LCRE	lower Columbia River and estuary
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PNNL	Pacific Northwest National Laboratory
rkm	river kilometers
RME	research, monitoring, and evaluation
SBU	survival benefit unit
WE	work element (Pisces)

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1.0 Introduction

This document is the annual report for fiscal year 2014 (FY14) for the project called Facilitation of the Estuary/Ocean Subgroup (EOS) and the Expert Regional Technical Group (ERTG). Pacific Northwest National Laboratory (PNNL) conducted the project for the Bonneville Power Administration (BPA). The EOS and ERTG are part of the research, monitoring, and evaluation (RME) and habitat restoration efforts, respectively, developed by the Action Agencies (BPA, U.S. Army Corps of Engineers [Corps or USACE], and U.S. Bureau of Reclamation) in response to obligations arising from the Endangered Species Act as a result of operation of the Federal Columbia River Power System (FCRPS) and implemented under the Columbia Estuary Ecosystem Restoration Program (CEERP). BPA/Corps (2014) explain the CEERP and the role of RME and the ERTG. For the purposes of this report, the lower Columbia River and estuary (LCRE) includes the floodplain from Bonneville Dam down through the lower river and estuary into the river's plume in the ocean (Figure 1.1).

Figure 1.1. Map Showing the Lower Columbia River and Estuary. The tidal freshwater portion is approximately from rkm 56 to 234. Bonneville Dam is located at rkm 234.

The purpose of this project is to facilitate EOS and ERTG meetings and work products. The EOS is working to coordinate implementation of the Estuary RME Program with the Northwest Power and Conservation Council's (Council's) Fish and Wildlife Program, federal RME parties, and other federal and non-federal entities conducting RME in the estuary. From 2002 through 2008, the EOS worked to design the federal RME program for the estuary/ocean (Johnson et al. 2008). From 2009 to the present day, EOS activities have involved RME implementation.

The ERTG assigns survival benefit units[1] for ocean- and stream-type juvenile salmon from estuary habitat actions implemented by the Action Agencies (AAs) as called for in the 2008 Biological Opinion on FCRPS operations. The ERTG has been operational since 2009. It is directed by a steering committee composed of representatives from BPA, National Marine Fisheries Service (NMFS), and USACE. BPA/Corps (2012) describe the ERTG and the role science plays in the process to assign SBUs to habitat restoration projects in the LCRE.

1.1 Project Objectives

The project had the following objectives for FY14, designated by work element (WE) codes from BPA's Pisces[2] project tracking system:

- Manage and Administer Projects (WE 119). Manage and administer the project according to BPA's "Work Element/Milestone" based project management and reporting system (Pisces).
- Produce Annual Report (WE 132). Produce an annual report of project activities, including under separate cover a pilot synthesis report of estuary/ocean RME as part of adaptive management at the program level.
- Produce Status Report (WE 185). Produce quarterly status reports and upload them to Pisces.
- Provide Watershed Coordination (WE 191). Much of the scope of work for this project (No. 2002-077-00) is coordination of RME and ERTG activities in the LCRE as part of the CEERP, as follows:
  - 191a − Estuary/Ocean Subgroup for Federal RME. Continue to facilitate the EOS in its mission to implement the Estuary RME Program.
  - 191b − Expert Regional Technical Group. Aid the AAs as they continue the ERTG's work to assess survival benefits to juvenile salmon from habitat restoration in the LCRE. Convene and coordinate with subcontractors who will be members of the ERTG.

1.2 Background

The function of the LCRE in the life history of threatened and endangered salmonids is more than simply serving as a corridor for passage between the tributaries and the Pacific Ocean (Bottom et al. 2005; Sather et al. 2009). The estuary provides habitat for multiple life-history stages of salmon and steelhead, ranging from the rearing and feeding of fry, fingerlings, and smolts to the passage upstream of adults (Bottom et al. 2005; Roegner et al. 2012). Use of estuary habitats by juvenile salmonids varies by species and life-history stage (Rich 1920). Generally, the closer the natal stream is to the estuary and the smaller the juvenile migrant, the more likely it is that juveniles will use estuarine habitats as feeding, rearing, and refuge areas, i.e., as more than just a migration corridor (Dawley et al. 1986). Wetlands in the LCRE also export materials that support food webs used by juvenile salmon (Thom et al. In Review). Information about salmon biology and ecology in the Columbia River estuary can be found in reports by

[1] A survival benefit unit (SBU) is an index intended to represent the effect of LCRE habitat restoration on juvenile salmon survival (ERTG 2011). The SBU method uses an ecosystem-based approach to assess improvements to habitats supporting juvenile salmon and other species. SBUs are assigned on a restoration project-specific basis.

[2] Pisces is a database application for project management for the BPA Fish and Wildlife Division.

Bottom et al. (1984, 2005), Dawley et al. (1985a, b, 1986), Kirn et al. (1986), Ledgerwood et al. (1991), McCabe et al. (1983, 1986), McConnell et al. (1983), and Reimers and Loeffel (1967). Thom et al. (2013) synthesized and evaluated information relevant to juvenile salmon in the LCRE.

In recognition of the estuary's importance to salmon population viability, the 2008, 2010, and 2014 Biological Opinions on operation of the FCRPS called for the restoration of estuarine habitat as a pivotal action to avoid jeopardizing the continued existence of listed salmonid populations (NMFS 2008, 2010, 2014), as well as comprehensive RME for listed salmon. As a result of the 2000 BiOp on FCRPS operations (NMFS 2000), the AAs and NMFS established a process for developing a basin-wide plan to guide RME efforts in the tributaries, hydrosystem, and estuary/ocean. The process involves a Policy Oversight Group and six technical subgroups: Status Monitoring, Effectiveness Research, Hydrosystem, Hatchery/Harvest, Data Management, and Estuary/Ocean. In FY15, federal RME efforts involved implementing the RME provisions defined in the 2008 BiOp, and reiterated in supplemental biological opinions in 2010 and 2014.

Overall in FY14, much of the work on the project concerned the ERTG and its role in the CEERP. Activities and accomplishments for the project during FY14 are documented in this annual report. Annual reports for the EOS/ERTG project have been submitted for FY05 through FY13 (Johnson 2005, 2006; Johnson and Diefenderfer 2007, 2008; Johnson 2009, 2010, 2011, 2012; Johnson and Sather 2013). These reports are available from BPA (http://www.cbfish.org/Report.mvc/SearchPublications/SearchByTextAndAuthorAndDate).

1.3 Study Area

The LCRE is defined as the tidally influenced portion of the river from Bonneville Dam to the plume. Habitats in lower Columbia River tributaries above tidal influence are not part of the estuary RME study area. The following publications provide descriptive information about the Columbia River estuary:

- the *Salmon at River's End* report by Bottom et al. (2005)
- Fresh et al.'s (2005) *Role of the Estuary in the Recovery of Columbia River Basin Salmon and Steelhead*
- the Corps' *Biological Assessment for the Columbia River Channel Improvements Project* (USACE 2001)
- the Council's subbasin plan for the estuary (Council 2005, 2009)
- recovery planning documents (Lower Columbia Fish Recovery Board 2010; NMFS 2011)

Important earlier compendiums include the following:

- *The Columbia River Estuary and Adjacent Ocean Waters* by Pruter and Alverson (1972)
- "Columbia River Estuary" in *Changes in Fluxes in Estuaries: Implications from Science to Management* by Dyer and Orth (1994)
- *Columbia River: Estuarine System* by Small (1990), which contains reviews of earlier work supported by the Columbia River Estuary Data Development Program (CREDDP) on physical and biological processes (CREDDP 1984a, 1984b).

1.4 Report Contents and Organization

The ensuing sections of this FY14 annual report describe project activities, summarize accomplishments, and provide recommendations for FY14. The sections on activities and accomplishments are organized by the work elements listed previously under project objectives (Section 1.1).

2.0 Project Activities

Activities during FY14 included project management, publishing the annual report and status reports, and coordination efforts, as described in the following sections for each work element (WE).

2.1 Project Management (WE119)

The project was managed according to procedures and principles set forth in PNNL's Standard Business and Management System. As requested by BPA, PNNL developed and submitted the FY14 scope of work and budget for Project 2002-077-00 to BPA via Pisces in August 2014.

2.2 Annual Report (WE 132)

This document fulfills the annual report objective.

2.3 Status Reports (WE 185)

PNNL submitted status reports on Project 2002-077-00 quarterly to BPA during FY14. The status reports contained information about whether progress in conducting the project was satisfactory. Status was assessed by milestone for each work element.

2.4 Coordination (WE 191)

The bulk of the work on the EOS/ERTG project falls under the coordination work element. The material that follows is organized by the topics listed under the coordination objective in Section 1.1.

2.4.1 EOS Meetings and Activities

During FY14, a subset of the EOS (namely BPA, Corps, PNNL) worked with the Estuary Partnership during several meetings to contribute to the CEERP's *Programmatic Plan for Action Effectiveness Monitoring and Research* (Johnson et al. 2014). The most important concern in this effort was design and implementation of the prioritization framework for action effectiveness research and monitoring studies.

2.4.2 ERTG Meetings and Activities

During FY14, the ERTG participated in 15 project presentations and 13 site visits (Table 2.1). The group scored 15 projects from which 15 SBU reports were generated. In addition, the ERTG was asked to review the Kandoll 2 project from FY13 it turns out the culverts on the site may have to be blocked. The ERTG decided not to rescore the project because the project design they scored previously included a hydraulic blockage on the upstream side of the culverts. Also, after the fact at the request of the Steering Committee, the ERTG scored a new alternative (900-ft total breach) for the Trestle Bay project. Table 2.2 contains a summary of ERTG's cumulative and FY14 activities, as facilitated through Project 2002-077-00. Since its inception in June 2009, the ERTG has been involved in 69 project presentations, 58 site visits, 62 project scorings, and 58 SBU reports (Table 2.2).

Table 2.1. ERTG's Project Review Activities during FY14

Identification Number	Project Name	Presentation	Site Visit	Scoring	SBU Report
2013-14	Youngs-Johnson	x	x	x	x
2013-15	Karlson Island	x	x	x	x
2014-01	1,000 Acres	x	x	x	x
2014-02	Lewis River WM	x	2009	x	x
2014-03	Kerry Island	x	x	x	x
2014-04	Wallacut	x	x	x	x
2014-05	Elochoman Slough	x	previously	x	x
2014-06	Chinook R Estuary	x	x	x	x
2014-07	Svensen	x	x	x	x
2014-08	Buckmire	x	x	x	x
2014-09	Shillapoo/Buckmire	x	x	x	x
2014-10	Skipanon 8th St Dam	x	x	x	x
2014-11	LaCenter	x	x	x	x
2014-12	Clatskanie	x	x	x	x
2014-13	Rinearson	x	x	x	x
Total		**15**	**13**	**15**	**15**

Table 2.2. Summary of ERTG's Project Review Activities: Number of Restoration Projects (Actions) for FY14 Total and Cumulative Total June 2009 through September 2014, as Facilitated through Project 2002-077-00.

Activity	Cumulative Total (6/09 through 9/13)	FY14 Total	Grand Total (6/09 through 9/14)
Sponsor presentations	54	15	69
Site visits	45	13	58
Scorings	47	15	62
SBU reports	43	15	58

During FY14, one regional ERTG meeting was held on December 4, 2013, at the Northwest Power and Conservation Council in Portland, Oregon, to report on ERTG activities and disseminate results from the ERTG's review of restoration projects during calendar year 2013. The meeting entailed an open question/answer session between the ERTG and interested regional parties.

The ERTG and its Steering Committee met eight times over the course of FY14 to work on topics relevant to assigning survival benefit units to estuary habitat restoration projects. Notes from the FY14 ERTG/Steering Committee meetings will be presented in a forthcoming ERTG work product due to BPA by December 1, 2014. The ERTG also met via conference call six times during FY14 to work on ERTG assignments.

Bi-weekly conference calls for the Steering Committee were conducted to plan and coordinate ERTG activities. The results of these calls are reflected in the content of the regional ERTG and ERTG/Steering Committee meetings. The Steering Committee held 20 such calls in FY14.

During FY14, the ERTG received one work request from the Steering Committee—to establish a standardized procedure for the significant digits of SBUs. Because several variables with different numbers of decimal places and significant digits are used in the SBU Calculator (ERTG 2011), establishing a standardized procedure for significant digits will provide consistency in the presentation of SBU values for each restoration project reviewed under the ERTG process. This will provide CEERP managers with a consistent method to sum SBU values across projects to quantify progress toward meeting programmatic SBU goals. The document is titled, "*Significant Digits for Survival Benefit Units*" (ERTG 2014).

At the request of the Northwest Power and Conservation Council, during FY14 the Independent Scientific Advisory Board (ISAB) reviewed the ERTG process for assigning SBUs. In January 2014, the ERTG made a presentation to and participated in a question/answer session with the ISAB. Subsequently, the ISAB issued a report outlining its findings (ISAB 2014).

3.0 Accomplishments and Recommendations

During FY14, accomplishments for BPA Project 2002-077-00 included the following:

- Continued to facilitate and document activities of the ERTG and its Steering Committee.
- Coordinated ERTG's work to produce an approach for significant digits for SBUs (ERTG Doc#2014-01).
- Organized, convened, facilitated, and documented 1 regional ERTG meeting, 7 ERTG/Steering Committee meetings or calls, and 19 Steering Committee conference calls.

Recommended project work in FY15 includes continued facilitation of the EOS and ERTG, as follows:

- Continue to facilitate the EOS in its mission to implement the RME component of CEERP.
- Aid the AAs as they continue the ERTG's work to assess survival benefits to juvenile salmon from habitat restoration in the LCRE under the CEERP.
- Support the ERTG in its effort to write a manuscript about the ERTG process.

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