Northwest **Power** and **Conservation** Council

July 29, 2014

MEMORANDUM

TO: Fish and Wildlife Committee members

FROM: Jim Ruff – Manager, Mainstem Passage and River Operations
Tony Grover – Director, Fish and Wildlife Division

SUBJECT: Corps of Engineers briefing on plans for future acoustic tag studies in the Columbia River Basin

Mike Langeslay and Dan Feil, who are Fishery Biologists at the Corps of Engineers-Northwestern Division, will present information to the Fish Committee on their Juvenile Salmon Acoustic Telemetry System (JSATS) studies. The Corps' presentation will include an overview of the fish tagging tool, the types of field studies it is being used for, the study planning process, and future planned studies to support implementation of both the NOAA Fisheries' 2014 FCRPS and Willamette Project Biological Opinions.

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Juvenile Salmon Acoustic Telemetry System (JSATS) Studies

Mike Langeslay and Dan Feil

Northwest Division, Corps of Engineers

Portland, Oregon

August 5, 2014

BiOp and Fish Accord Implementation

- BiOps Provide Overarching Framework for RME
- Corps Plans and Seeks Funding Based on BiOp and Accords Schedule
  - FCRPS – 2018
  - Willamette - 2023
- Annual Planning Schedule (AFEP):
  - Develops study details for BiOp Frameworks
  - Enables adaptive management

Endangered Species Act Section 7(a)(2)
Supplemental Biological Opinion

Consultation on Remand for Operation of the
Federal Columbia River Power System

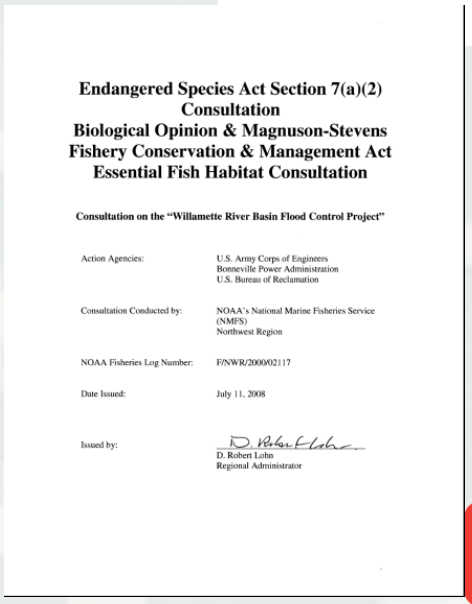
Action Agencies: U.S. Army Corps of Engineers (Corps)
Bonneville Power Administration (BPA)
U.S. Bureau of Reclamation (Reclamation)

Consultation Conducted by: NOAA's National Marine Fisheries Service
(NOAA Fisheries)
Northwest Region

NOAA Fisheries Log Number: NWR-2013-9562

Date Issued: January 17, 2014

Issued by:
Will Stelle
Regional Administrator



Endangered Species Act Section 7(a)(2)
Consultation
Biological Opinion & Magnuson-Stevens
Fishery Conservation & Management Act
Essential Fish Habitat Consultation

Consultation on the "Willamette River Basin Flood Control Project"

Action Agencies: U.S. Army Corps of Engineers
Bonneville Power Administration
U.S. Bureau of Reclamation

Consultation Conducted by: NOAA's National Marine Fisheries Service
(NMFS)
Northwest Region

NOAA Fisheries Log Number: F/NWR/2000/02117

Date Issued: July 11, 2008

Issued by:
D. Robert Lohn
Regional Administrator

Anadromous Fish Evaluation Program Study Development Process

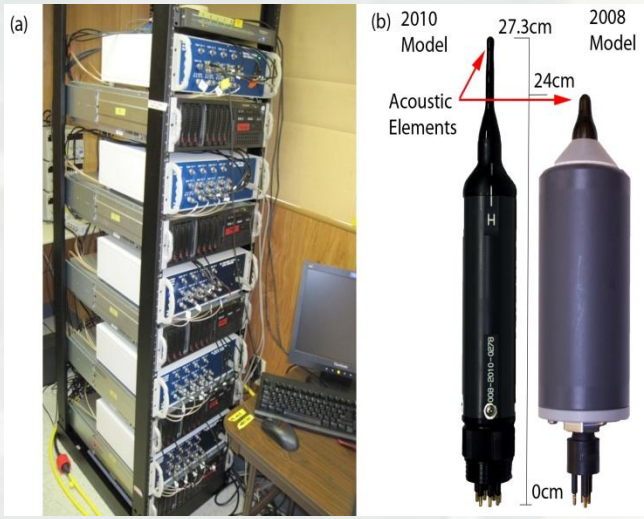
Tasks

- Regional Team Participates in Annual Planning Cycle
- Study Needs and Priorities Developed – by Objective
- Draft Proposals Reviewed and Revised to Meet Objectives
- Study Results/Reports Reviewed
- ISRP/ISAB Reviews AFEP Elements

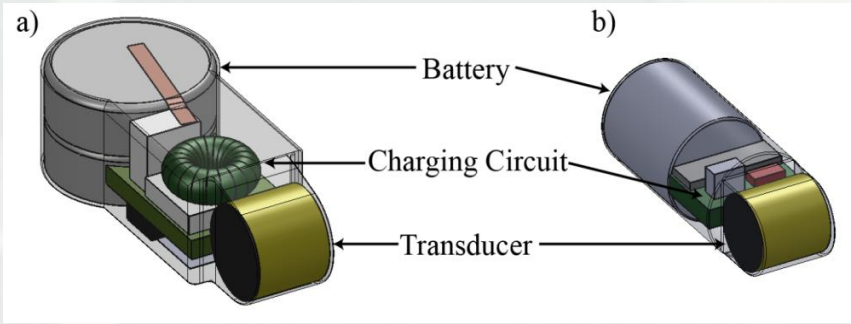
Work Group Participants

- NOAA Fisheries
- BPA
- FWS
- Tribes
- ODFW
- WDFW
- IDFG

What is JSATS?



- Tool for use in mark-recapture studies
  - Hydrophones
  - Receivers
  - Miniature Tags
- Uses:
  - Survival (Dam Passage, Estuary)
  - Behavior (Distribution, Approach)
- Species / Life-stages
  - Salmon, Steelhead, Pacific Lamprey
  - Adults and Juvenile Life Stages



U.S.ARMY

Study Cost Drivers

- Metrics: Example - dam survival estimation requires active tag methods
  - ► Radio Telemetry
  - ► Acoustic Telemetry
- Precision: Higher detection probability = higher precision and/or lower **sample size** requirements
  - ► Cost is in labor to capture, tag, and release fish
  - ► Cost per tag (expensive tags)

FCRPS Test Plans

1. Performance Testing

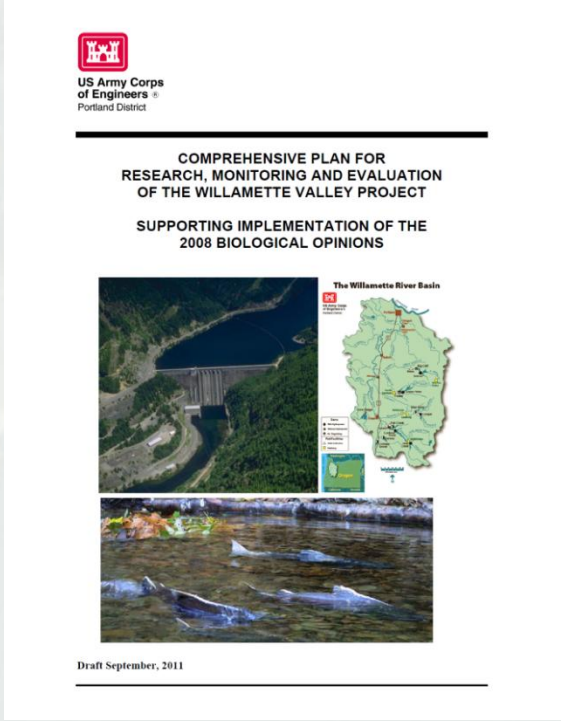
Project	Spring Test Schedule	Spring PS Results		Summer Test Schedule	Summer PS Results	
		Review	Decision		Review	Decision
Bonneville	2016, 2017	2013, 2018[1]	2014 or 2018	2016, 2017	2013, 2017, 2018	2018
The Dalles	Complete	2013	Early 2014	Complete	2013	Early 2014
John Day	Complete	2013	Late 2014	2014	2015	2016
McNary	2014	2015	2016	2014, 2015	2016	2017
Ice Harbor	2015	2016	2017	2015, 2016	2017	2018
Lower Monumental	Complete	2013	Early 2014	2013	2014	2015
Little Goose	Complete	2013	Early 2014	2013	2014	2015
Lower Granite	2016, 2017	2018	2018	2016, 2017	2018	2018

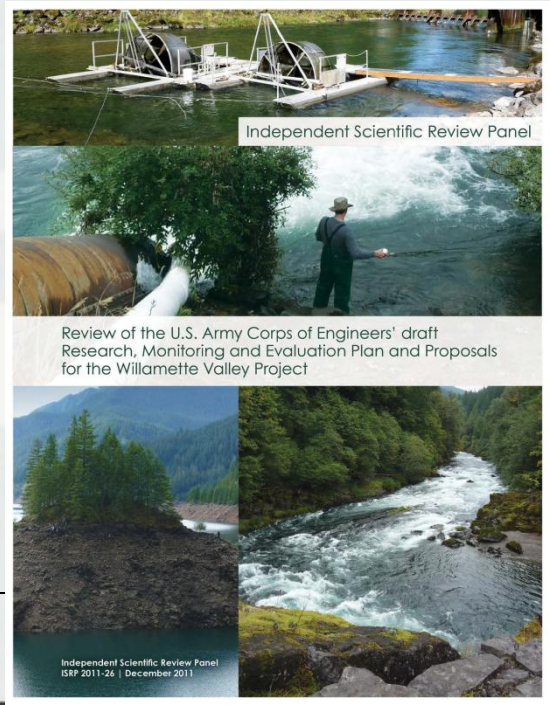
2. Juvenile Lamprey Tag Development – Current – 2018 depending on available funding and Accord Partner priorities

3. Post-Bonneville survival – 2016 – 2017.

Willamette Plans

- Comprehensive RME Plan Developed in 2011 – Reviewed by ISRP
  - ► Included active tag studies annually through 2023
- Willamette BiOp
  - ► Outlines RME process
  - ► Uses Similar Annual Planning Process as AFEP
- Configuration and Operation Plan Under Development
  - ► Expect refined schedule in spring 2015





Summary of Future JSATS Studies

- FCRPS Performance Tests Occurring 2015-2017 – no plans beyond 2018.
- Pending funds for development, JSATS being designed for juvenile lamprey
- Use of JSATS in Willamette is smaller scale and used for less costly objectives
- Willamette Implementation Strategy will Refine RME Schedule. Expect Active Tag Studies to Occur Annually Through 2023.

Summary – Cost

- Certain Study Objectives Require Active Tag Tools
- JSATS and Radio Telemetry are Comparable in Cost – Each has advantages and disadvantages for specific objectives and environments.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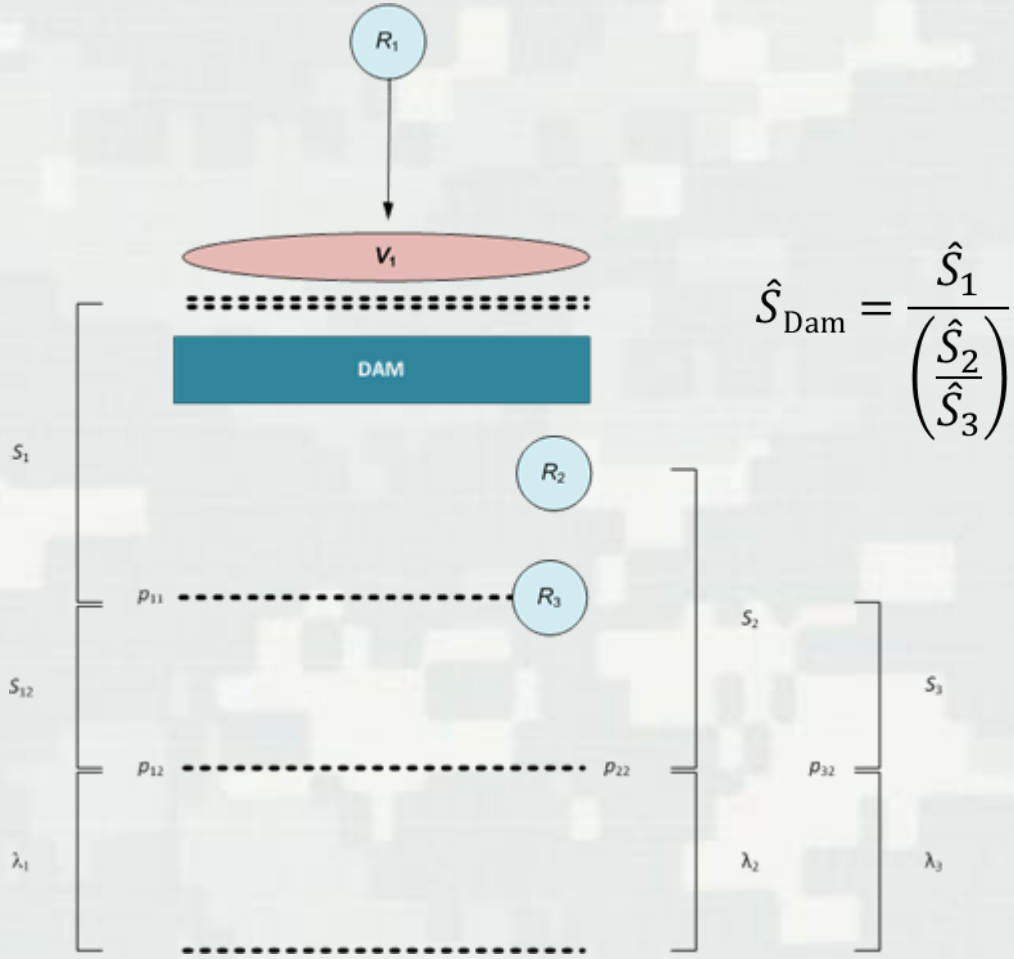
Virtual/paired-Release DESIGN



$$\hat{S}_{\text{Dam}} = \frac{\hat{S}_1}{\left(\frac{\hat{S}_2}{\hat{S}_3}\right)}$$

Bonneville Dam Performance Test Results

Species	Dam Passage Survival (% with Standard Error)	Forebay/Tailrace Passage Time (hours)	Spill Passage Efficiency (%)
100-kcfs Spill (April 30-May 13, 2011)			
Yearling Chinook	95.7% (0.4%)	n/a	n/a
Juvenile Steelhead	97.6% (1.8%)	n/a	n/a
181-kcfs Season-wide Spill (April 30-May 31, 2011)			
Yearling Chinook	96.0% (1.8)	0.6/0.4	56.6
Juvenile Steelhead	96.5% (2.1)	0.9/0.4	54.4
149 kcfs Season-wide Spill (June 19 – July 22, 2012)			
Subyearling Chinook	97.4 (0.7)	0.5/0.4	53.2

The Dalles Dam Performance Test Results

Species	Dam Passage Survival (% with standard errors)	Forebay Passage Time (hours)	Spill Passage Efficiency (%)
The Dalles Dam (2010) – 40 Percent Spill			
Yearling Chinook	96.4 (1.4)	1.28	94.7
Juvenile Steelhead	95.3 (1.4)	1.28	95.4
Subyearling Chinook	94.0 (0.9)	1.20	83.0
The Dalles Dam (2011) - 40% Spill			
Yearling Chinook	96.0% (1.0%)	0.97	83.1
Juvenile Steelhead	99.5% (0.8%)	0.81	89.2
The Dalles Dam (2012) - 40% Spill			
Subyearling Chinook	94.7 (0.6)	1.08	70.7

John Day Dam Performance Test Results

Species	Dam Passage Survival (% with standard error)	Passage Time (hours) Forebay/Tailrace	Spill Passage Efficiency (%)
2011 - 30-Percent Spill			
Yearling Chinook	96.7 (1.0)	2.0/0.6	61.2
Juvenile Steelhead	98.4 (0.9)	4.3/0.6	61.2
2011 - 40-Percent Spill			
Yearling Chinook	97.8 (1.1)	1.5/0.6	66.4
Juvenile Steelhead	99.0 (1.0)	3.2/0.6	65.9
2011 - Seasonwide Spill			
Yearling Chinook	96.8 (0.7)	1.4/0.6	63.7
Juvenile Steelhead	98.7 (0.6)	2.9/0.6	62.9
2012 Seasonwide Spill			
Yearling Chinook	96.7 (0.7)	1.2/0.4	74.6
Juvenile Steelhead	97.4 (0.3)	2.4/0.5	74.5
Subyearling Chinook	94.1 (0.3)	1.0/0.5	69.6

McNary Dam Performance Test Results

Species	Dam Passage Survival (%)	Passage Time (hours) Forebay/Tailrace	Spill Passage Efficiency (%)
Yearling Chinook	96.2% (1.4)	1.8/0.4	72.5
Subyearling Chinook	97.5% (1.1)	1.8/0.4	78.3
Juvenile Steelhead	99.1% (1.8)	1.8/0.3	83.2

Lower Monumental Dam Performance Test Results

Species	Dam Passage Survival (%)	Median Forebay Passage Time (hours)	Spill Passage Efficiency (%)
Lower Monumental 2012			
Yearling Chinook	98.7 (1.8)	2.4	78.9
Steelhead	98.3 (0.4)	2.2	65.9
Subyearling Chinook	97.9 (1.6)	2.6	83.6
Lower Monumental 2013			
Subyearling Chinook	93.0 (1.1)	17.4	89.1

Little Goose Dam Performance Test Results

Species	Dam Passage Survival (%)	Median Forebay Passage Time (hours)	Spill Passage Efficiency (%)
Little Goose 2013			
Yearling Chinook	98.2 (0.8)	2.58	65.3
Steelhead	99.5 (0.8)	2.67	56.1
Subyearling Chinook	95.1 (1.0)	2.80	72.5
Little Goose 2013			
Subyearling Chinook	90.8 (1.4)	12.3	76.8