

The Dalles Dam Impact Documents for Research Activities Proposed to be conducted  
by University of Idaho Personnel during 2014

United States Army, Corps of Engineers, Portland District  
The Dalles, OR 97058

January 2014

## **Background**

Adult salmon and lamprey migrating to their natal streams in tributaries of the Columbia River must pass up to nine dams and their reservoirs, four each in the lower Columbia and Snake rivers and five in the mid-Columbia River. Stress, delays, and losses during migration at each hydroelectric project and associated reservoir should be minimized to succeed in maintaining the native runs of fish and to achieve the recovery goals outlined by the Northwest Power Planning Council (NWPPC) and by NOAA Fisheries. Most of the work proposed to be conducted during 2014 was developed in response to requests for preliminary proposals issued by the U.S. Army Corps of Engineers (CORPS) in September 2013.

## **Objectives**

The goals of these studies are to:

1) evaluate effects of the extended spillwall at TDA and the resulting spill pattern on passage metrics of sockeye salmon and spring-summer Chinook salmon (adult and jack). At The Dalles Dam, we propose to monitor the movements of adult salmon and steelhead outfitted with radio tags at Bonneville Dam.

2) develop and evaluate aids to passage and survival of adult Pacific lamprey *Lampetra tridentata* at lower Columbia River dams. At the Dalles Dam, we propose to monitor the movements of adult Pacific lampreys outfitted with half-duplex PIT tags and acoustic-tags (JSATS) at Bonneville Dam.

## **Methods**

Recent major modifications designed to improve adult or juvenile salmonid or Pacific lamprey passage include the construction of a spillwall to improve juvenile salmonid passage at The Dalles Dam in the winters of 2008-09 and 2009-10. A single year of post-modification monitoring of adult Chinook salmon indicated no adverse effects on adult spring Chinook salmon passage (Jepson et al. 2011). More recent examination of dam counts suggests that smaller-bodied adults such as sockeye and jack Chinook salmon are finding and passing TDA North Fishway at lower rates than prior to the completion of the spillway. Whether the lower passage rates are associated with delayed or failed passage by individual fish is currently unknown and will be explicitly tested here using radio telemetry.

In recent years, adult Pacific lamprey counts at lower Columbia River dams have reached record lows, and the need to improve lamprey passage has become critical. Both structural and operational changes at Bonneville Dam have been made to facilitate lamprey passage, and monitoring throughout the drainage is needed to evaluate their efficacy and identify problematic passage areas. Lamprey passage structures (LPSs) are located at Bradford Island and Washington-shore auxiliary water supply (AWS) channels, and there are prototype lamprey collectors for the northwestern main entrance to the Washington-shore fishway and the Cascades Island fishway entrance. In addition

to monitoring lamprey passage at these locations, we plan to continue modification of LPSs and development of lamprey-friendly design changes at lower Columbia River dams. These include extension of the Cascades Island LPS to allow volitional passage, and modification of The Dalles East Fishway raised orifices.

Monitoring adult lamprey movements via HD-PIT technology is needed both to assess the efficacy of passage improvements and to determine the best locations for future structural and operational changes. In addition, this monitoring continues a long-term database of lamprey movements that allows examination of a variety of potential contributors to lamprey loss. These include the effects environmental variability, and specific dam structures and operations. We propose to tag up to 900 lampreys with HD-PIT tags and up to 600 with radio and HD-PIT tags and at Bonneville Dam in 2014, depending on lamprey abundance. HD-PIT antennas at fishway entrances and exits and additional detectors that are integrated into each LPS will allow calculation of overall lamprey passage times, passage efficiency, and route selection. HD-PIT readers and antennas installed at The Dalles and John Day dam fishways will also be used to calculate lamprey passage times and to estimate passage success rates between dams (using fish released downstream from Bonneville Dam).

### **Justification of the Proposed Study Area**

The studies proposed address research priorities related to improving passage and survival of adult lamprey identified by the Corps of Engineers, state and tribal fish agencies, and NOAA Fisheries. Understanding the relative contributions to lamprey production from different tributaries requires that we sample from the most-downstream dams on the Columbia River.

### **Schedule**

Telemetry monitoring of lamprey using HDX-PIT antennas is on-going and will continue during all of 2014. Charles T. Boggs will be involved with downloading HD-PIT detectors at The Dalles Dam as part of research activities already approved by USACE We aspire to begin collecting adult salmonids at Bonneville Dam in early April 2014 and juvenile lampreys as soon as 15 May, proceeding through as late as 30 September 2014. Jeff Garnett and Les Layng will be responsible for maintaining the radiotelemetry array. Copies of all appropriate state permits to conduct the proposed research will be presented to Corps Biologists prior to initiating any work.

### **Facilities and Equipment Requirements**

We request permission to access receiver sites at the East and North ladder tops, the North, South, West, and East fishway openings and lower ladders (Figure 1). We proposed to install one radio receiver near the top of the southern portion of the spillway. HD receivers are deployed at the East and North ladder tops, and there is one HD receiver at the base of the East fishway.

## The Dalles Dam - 2010 Setup

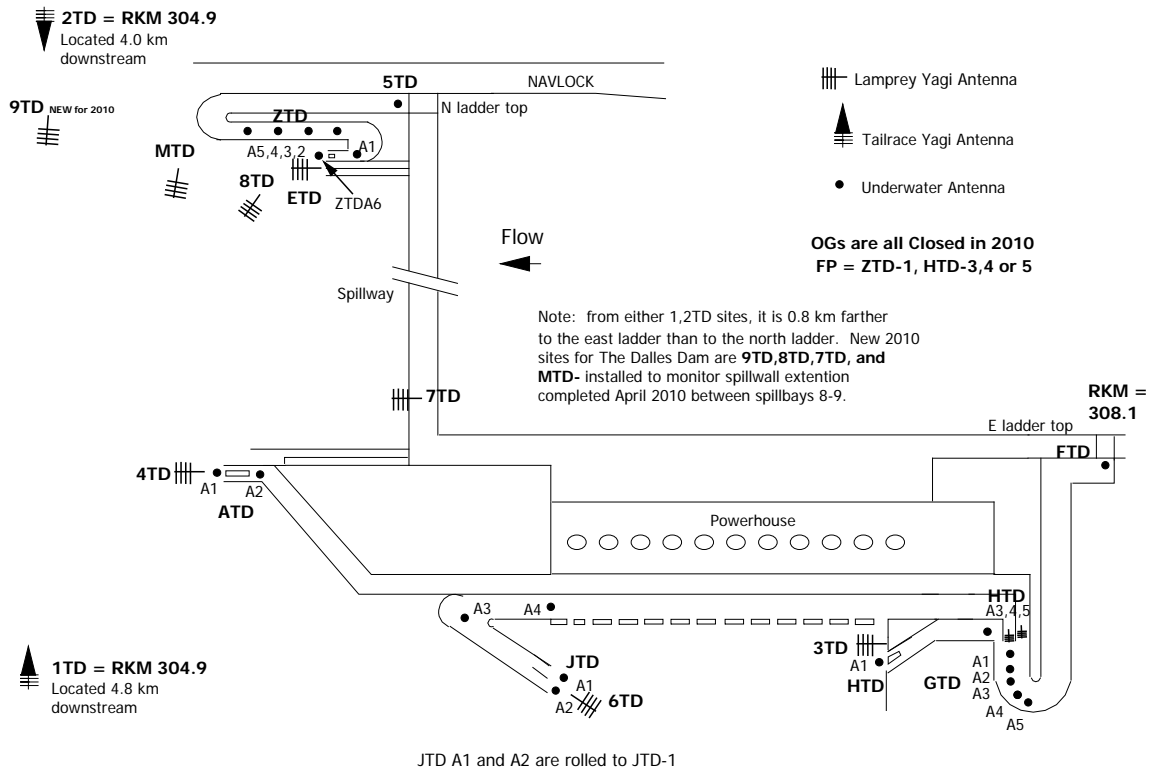


Figure 1. Diagram of proposed radio antenna/receiver installations at The Dalles Dam in 2014.

## PROJECT IMPACTS

### Project Services

We expect the proposed activities will have few or no impacts on the activities customarily performed by USACE personnel. Should help be required from USACE personnel for any reason, we will notify the Project Fishery Biologist of any requests for assistance with as much forewarning as possible.

### Security

Charles Boggs, Travis Dick, Les Layng, and Jeff Garnett will carry a The Dalles Dam ID badge and will notify project personnel when they enter and leave The Dalles Dam. Project security issues involve access to bypass/separator facilities. Areas of work for these activities will be restricted to the locations of the receiver sites. All personnel are U.S. citizens. We have no plans to conduct research work in the Boat Restricted Zone (BRZ) during 2014.

## **Safety**

All UI personnel will wear a hard hat and safety shoes while on the dam. Other suitable work clothing will include long pants and no tank tops, suitable hand covering, and cold weather/rain gear will be used as necessary. All personnel will follow procedures provided in USACE Safety and health requirements Manual, EM 385-1-1.

Care will be taken to eliminate any slippery areas where he must walk. He will wear protective hearing devices where and when necessary. Care will be taken to not walk outside of approved walkways after dark. Material Data Safety Sheets (MSDS) will be provided for all substances requiring them and care will be taken to follow MSDS requirements. A list of personnel and the expiration dates of their First Aid and CPR is presented below.

Downloading receivers: Powerhouse operators will be notified when downloaders enter the dam area. Downloading will occur when it does not interfere with ongoing work at the dam. No activity will take place outside of safety railings except by personnel using approved safety harnesses and approved fall-protection devices.

Antenna repairs: Safety procedures and hazard analysis will be followed when specific repairs are needed. All safe work practices will be followed during repairs. Project personnel will be notified before work proceeds on unscheduled repairs.

## Job Safety Analysis

PRINCIPLE STEPS	POTENTIAL HAZARDS	RECOMMENDED CONTROLS (FROM EM 385-1-1)
<p>1. Installing radio- and PIT-telemetry antennas.</p>	<p>Working in severe weather.</p> <p>Riding in a manbasket and climbing ladders creating a potential for falls onto hard surfaces.</p> <p>Riding in a manbasket and climbing ladders creating a potential for falls into water.</p> <p>Potential for being struck by falling objects causing head injury or foot injury.</p> <p>Lifting heavy equipment causing the potential for back strain.</p> <p>Working around and with power and hand tools and equipment causing the potential for injuries to the hands, as well as to other parts of the body.</p>	<p>Be alert to and prepare for severe weather. Wear several layers of warm clothing for protection from the cold and, as the weather indicates, a waterproof over-garment for protection from the rain (*06.J).</p> <p>Wear work vests and safety harnesses whenever exposed to hazards of falling. When working from ladders, spotters shall be present and responsible for handling ropes and securing equipment (*05.1, 05.F.01-.03, and 21.D.)</p> <p>When working over water, always wear a personal floatation device. Wear work vests and safety harnesses whenever exposed to hazards of falling. When working from ladders, spotters shall be present and responsible for handling ropes and securing equipment (*05.1, 05.F.01-.03, 21.D, and 0.F.05, 05.1.01).</p> <p>Always wear hard hats and steel-toed boots. Be aware, at all times, of the location of the crane and the crane boom (*05.D.01, 02, 04, 05,A.08, and 08.A-B).</p> <p>Never attempt to lift a heavy object by yourself. Use a back brace. Use safe lifting techniques such as lifting with your legs rather than with your back.</p> <p>Wear appropriate hand protection and other protection gear. Know how to operate the tools before starting, especially power tools. Be alert as you work and watch for potentially hazardous situations (*05.A.10)</p>
	<p>Potential for eye injury due to working with power tools.</p> <p>Exposure to noise.</p> <p>In using power tools, potential for electric shock.</p> <p>Tripping hazards.</p>	<p>Always use safety goggles when using a power drill or other power tool that could send debris flying (*05.B.01, 02, 06).</p> <p>Use ear protection devices when using power tools and working in the fishway (*05.C.01, 04, 07).</p> <p>Inspect tools to ensure there are no frayed cords or other obvious defects. When working with electrical equipment in damp areas, wear boots with soles of rubber or other insulating materials.</p> <p>Practice good housekeeping in keeping work area uncluttered. Be aware of potential tripping hazards that cannot be removed (*14.C.01-04, 08).</p>

## Lists of Personnel, Vehicles, and Boats

### Personnel

NAME	AGENCY	ACTIVITY	1 <sup>ST</sup> AID EXP. DATE	CPR EXP. DATE
Caudill, Chris	U of Idaho	Downloading half-duplex PIT receivers, installing and maintaining radio-telemetry equipment		
Boggs, Charles	U of Idaho	Downloading half-duplex PIT receivers, installing and maintaining radio-telemetry equipment	n/a	n/a
Travis Dick	U of Idaho	Downloading half-duplex PIT receivers, installing and maintaining radio-telemetry equipment		
Jeff Garnett	U of Idaho	Downloading half-duplex PIT receivers, installing and maintaining radio-telemetry equipment		
Les Layng	U of Idaho	Downloading half-duplex PIT receivers, installing and maintaining radio-telemetry equipment		

**Vehicles** – Listed UI may be travelling in any of the listed U. Idaho vehicles on a given day.

LICENSE	STATE	DESCRIPTION	COLOR	AGENCY	OWNER	POC/CREW
X2044	ID	FORD F250 PU Truck	GREY	U OF I	U OF I	Johnson, Eric
X3262	ID	FORD SUPER DUTY F250 PU Truck	GREY	U OF I	U OF I	Johnson, Eric
X3278	ID	CHEVROLET S10 PU Truck	WHITE	U OF I	U OF I	Johnson, Eric

X3380	ID	F250 SUPER DUTY PU Truck	BROWN	U OF I	U OF I	Johnson, Eric
X3582	ID	SUBARU OUTBACK Wagon	GREEN	U OF I	U OF I	Johnson, Eric
X 3874	ID	CHEVROLET SILVERADO 4X4 PU Truck	BLUE	U OF I	U OF I	Johnson, Eric
X 2728	ID	FORD F250 4X4 PU Truck	GREY	U OF I	U OF I	Johnson, Eric
X4123	ID	Chevy 4x4 Colorado Crew Cab	Blue	U of I	U of I	Johnson, Eric

**Boats – n/a**

REG.	NAME	LENGTH (ft)	AGENCY	ACTIVITY	POC

**Trailer – n/a**

REG.	NAME	LENGTH (ft)	AGENCY	ACTIVITY	POC

**References**

Jepson, M.A., M.L. Keefer, C.C. Caudill, and B.J. Burke. 2011. Behavior of radio-tagged adult spring-summer Chinook salmon at the Dalles Dam in relation to spill volume and the presence of the bay 8/9 spill wall, and at John Day Dam in relation to North Shore Ladder modifications, 2010. UI FERL Report 2011-2 for the US Army Corps of Engineers, Portland District.