RESEARCH PACKET/PROJECT IMPACTS – BONNEVILLE DAM

Development of Adult Lamprey Passage Structures at Lower Columbia River Dams - 2014

Study Code: LMP-P-14-1

United States Army, Corps of Engineers, Portland District
Bonneville Lock and Dam
Cascade Locks, Oregon 97014
(541)374-8801

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Project Leaders

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Background

Pacific lamprey are anadromous and adult in the interior Columbia River basin must pass up to eight or nine dams and reservoir to reach spawning areas historically used by the species. 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. This project was initiated to gain information on migration behavior of adult lamprey, and to improve their passage at lower Columbia River Dams. Installation of new passage structure or improvements to existing structures at several locations will yield further benefits to lamprey passage.

This project is in support of the U.S. Army Corps of Engineers' (USACE) efforts to improve Pacific lamprey passage at hydroelectric dams on the Lower Columbia River. Development of experimental passage structures and evaluation of these and other fishway modifications are critical components of lamprey passage improvement actions identified in the 2008 Columbia Basin Fish Accords and the USACE *Pacific Lamprey Passage Improvements Implementation Plan* (2009).

Objectives/Methods

1. Experimental wetted wall structure testing in the FERL and auxiliary water supply (AWS).
    a. Utilize a raceway and supplied water in the FERL facility for testing three flow treatments and options for crest structure of a wetted wall climbing structure for lamprey. Volitional climbing tests will be conducted using a circular track structure design for 2 weeks during June on up to 20 fish collected by trap and intended for release upstream of Bonneville Dam. Trials will be conducted during both day and night hours and fish allows to attempt to navigate the climbing wall circuit for no more than 2 hours. We will monitor passage success and the number of attempts made by each fish. No anesthetic use will be necessary for these tests.
    b. Given successful testing in the FERL, we will install a wetted wall structure in an auxiliary water supply channel, likely at Washington Shore. The climbing wall will terminate just below the water line given access limitations. Fish collected in this effort will be enumerated and treated like those collected in other traps.

2. Initiation of operations (dewinterizing) for existing LPSs following the winter maintenance period.
    a. Pump maintenance, alarms, and replacement/installation of pumps and counters as necessary at the Cascades Island LPS.
    b. Installation of exit slides, tuning of counters, configuration of communication networks for transmitting count data at all Bonneville Dam LPS structures.

3. Modify the Bradford Island lamprey passage structure (LPS) exit section pipe to facilitate cleaning and inspection.
    a. A hinge mechanism will be added to the exit pipe section to allow in-season access to the exit slide and counting mechanisms.

4. Modify LPS counters at Bonneville Dam for improved sensitivity and precision.
    a. At all LPS structures, install new waterproof switches and an improved flapper design that avoids previous issues with double-counting fish due to bounce. We will provide quality control and test an alternative counting approach using a Smith-Root impedence counter at the Washington-shore LPS. Additional LPS count validation by video will be coordinated with USACE personnel. Regular checking and maintenance of these systems will be conducted.

5. Design and build tanks for temporary holding of lamprey for tribal or research purposes.
    a. Facilities for holding lamprey pending distribution to appropriate locations for tribal and research purposes are limited. We will design and install tanks for temporary holding of lamprey prior to their distribution to meet tribal needs.

6. Replace the lead large picket separating the fishway from the auxiliary water supply (AWS) channel to make picket spacing ¾".
    a. This change will put the final section in keeping with the other sections which were replaced previously.

Justification of the Proposed Study Area

The proposed work addresses research priorities and installation/modification needs identified by the Corps of Engineers and tribal fish agencies. The lamprey passage systems in questions are installed at Bonneville Dam, and it is an ideal place for testing a climbing wall due to the potential for future proposed installation and access to fish.

Schedule

Modifications to LPS structures and exit counters are to be accomplished prior to May 5.

We aspire to conduct climbing wall experiments in the FERL during two weeks in June, pending availability of fish from trapping operations in the Cascades Island AWS. Steve Corbett and Mike Hanks will be conducting day and night trials to assess climbing wall use and success. Subsequent installation of a modified structure in the Cascades Island AWS will occur in July, pending results of June climbing tests.

Tanks for temporary holding of lamprey will be designed in the spring and should be installed in June. Siting will be coordinated with project personnel prior to installation.

The large picket will be installed in April once the powder coating is finished and installation will be coordinated with Corps personnel.

Facilities and Equipment Requirements

We request permission to access sites where LPS structures are located, access to electrical outlets in areas where PIT detectors and counting equipment for LPS structures are installed, and permission to use the FERL (including water supply and power) from May through July. Video count validation may be necessary on Corps-maintained computers in coordination with the Field Fisheries Unit. Crane support will be necessary for installation of the large picket at the Bradford Island fishway. Access to the southwest tower is necessary for configuration of the network connection that services the counters.

PROJECT IMPACTS

Project Services

Crane support will be necessary for replacement of the large picket at the Bradford Island fishway. Video validation will be coordinated with the Field Fisheries Unit. Installation of a temporary wetted wall structure in the Cascades Island AWS will be discussed with project personnel and approved prior to installation. We do not anticipate requiring additional assistance from project personnel at this time. Still, we would like to be able to request assistance from project personnel if/when it is needed. We will notify the Project Fishery Biologist of any requests for assistance with as much forewarning as possible.

Security

All NOAA Fisheries personnel will carry Bonneville Dam ID badges and will notify project personnel when they enter and leave Bonneville Dam. Project security issues involve access to the LPS sites to service counters and to the Cascades Island LPS to service pumps and counters. Access to the FERL will be necessary to install an experimental wetted wall climbing structure and to run climbing experiments. Areas of work will include the Washington shore FERL, Cascades Island AWS channel, and LPS structures located at Bradford Island, Cascades Island, and Washington Shore. We also need to access the southwest tower of the spillway to program the data transmitter.

All NOAA Fisheries personnel listed on the ensuing page are U.S. citizens. We have no current plans to conduct research work in the Boat Restricted Zone (BRZ).

Safety

All personnel will wear hard hats 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 and safety gear will be used as necessary. All personnel will follow procedures provided in the USACE Safety and health requirements Manual, EM 385-1-1.

1. FERL Lamprey Climbing Wall trials: Personnel will receive training in operation of water valves and electrical constraints. Personnel will call in and out to operator on duty when working outside normal daytime business hours. Care will be used when working near or above water.
2. Lamprey LPSs: Care will be taken to eliminate any slippery areas near the LPSs where employees must walk. Care will be taken to not walk outside of approved walkways after dark. Provisions for adequate lighting will be made for working near the lamprey passage structures

during the night. 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.

AHA

Hazard analysis forms specific to each installation task will be submitted prior to initiation of the work.

Principle Steps	Potential Hazards	Recommended Controls
Conducting FERL wetted wall testing	Exposure to noise. Potential for head and foot injury from working around industrial equipment. Tripping hazards.	Use ear protection devices when using power tools or when noisy due to rushing water. Wear hard hat and steel-toed boots at all times. Practice good housekeeping in keeping work area uncluttered. Be aware of potential tripping hazards that cannot be removed.

List of Personnel

Name	Agency	Activity
Corbett, Steve	NOAA Fisheries	FERL and LPSs
Frick, Kinsey	NOAA Fisheries	FERL and LPSs
Hanks, Mike	NOAA Fisheries	FERL and LPSs
Marr, Ron	NOAA Fisheries	FERL and LPSs
Moser, Jeff	NOAA Fisheries	FERL and LPSs
Moser, Mary	NOAA Fisheries	FERL and LPSs
Wassard, Bill	NOAA Fisheries	FERL and LPSs
Wolf, Galen	NOAA Fisheries	FERL and LPSs

List of Regular Vehicles

GSA Dodge Dakota, License #G61 1047H

GSA Ford F-450, License #G71 0312M