Anadromous Fish Passage Program
Lewis River, Washington

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April 23, 2014
Lewis River Hydroelectric Projects
SW Washington
Merwin Dam: 1931
Height: 313 Ft.
Yale Dam: 1953
Height: 323 ft.
Swift Dam: 1958
Height: 512 ft.
Project Background

- June 26, 2008 – PacifiCorp and Public Utility District No. 1 of Cowlitz County received licenses from the Federal Energy Regulatory Commission (FERC)

- Licenses include the Lewis River Settlement Agreement that contains 17 Sections and requires implementation of 69 measures
  - Aquatics
  - Terrestrial Species
  - Recreation
  - Cultural Resources
  - Flood Management
Settlement Agreement Aquatic Enhancements

- **Goal:** Genetically viable, self-sustaining, naturally reproducing, harvestable populations of anadromous fish upstream of Merwin Dam.

- Fish passage is key to achieving the goal. Installation of the Merwin and Swift Facilities opens up 117 miles of anadromous fish habitat upstream of Swift Dam.
Anadromous Fish Reintroduction - Stage 1; Phase 1

1. **Haul Natural Adults to Swift**
   - **Trap and Sorting Facility**
   - **Hatcheries**
      - Separate out Hatchery Fish
      - Trap Adults

2. **Collector and Sampling Facility**
   - Collect Juveniles FSC

3. **Haul Wild Juveniles to Release Pond Downstream of Merwin**
Major Components

- Merwin Upstream trap/sort/transport
- Adult Release Facilities
- Swift Floating Surface Collector (FSC)
- Mooring Tower and Dolphin
- Trestle
- Fish Transfer Structure
- Net System
- Debris Booms
Past Practice – Manual Handling
Fish Transferred from Hopper to Truck
New Fish Trap Entrance
Installation of the dam tap for new turbines
Two 500 kw Francis turbines and pumps for combined AWS flow
Sorting Building operations

3,000 gallon holding tanks

Pond

250 gallon holding tanks

2nd Floor Sorting Building

Jump weir

Pre-sorting pond

Sorting building operations
Fish Released in Upper Watershed
Swift Reservoir
Floating Surface Collector (FSC)
Net Transition
Net Transition Structure
Modular Construction

- Upper Deck
- Lower Deck
- Belly Tanks
Cranes holding belly tank section in place for welding
Fish Entrance/Screen Section
Baffles and Pumps
FSC on the move to lower ground
Positioned for reservoir to rise
Trestle Moorage Construction
FSC towed into place at trestle
FSC in Operation
Fish Attraction Channel
Control Weir
Fish Capture Operations

Plan View of FSC
Fish Separator Bars & Dewatering Flume
Fish Separator Bars
Fry and Smolt Tanks
Fish Sampling Floor
Fish Transfer Hopper
Hopper Lifted to the Mooring Tower
Filling Fish Truck
Loading Fish Truck
Defining Roles and Responsibilities

Who runs it?
- Fish Passage Team (Biologists)
- Fish Truck Drivers (Utility workers)
- Maintenance (Hydro Maintenance Crews)

Engineering Support and Operations

Key to smooth operation is open and direct communication
Defining Roles and Responsibilities

- Responsibility Matrix – what needs to get done
- Assigned tasks – Who does the work?
Transfer of Knowledge

- Orientation and Training of PacifiCorp Staff
- Ten Day Operational Test
Identifying Needs

- O&M Manuals
- Development of Maintenance Schedules based on manufacturers’ recommendations
Minimizing Risk

- Identifying Critical Alarms & Components
- Remote Monitoring of FSC- Human/Machine Interface
Lessons Learned

- Open communication is key
- Know your equipment – Get training
- Understand your compliance metrics – track results and address underperformance
- Be ready with Plan B
  - On-call fish technicians
  - Contracts with key maintenance vendors
Expect the Unexpected
Large Debris
Small Debris
Small Debris Boom
Small Debris Boom Function
For more information please visit:

http://www.pacificorp.com/es/hydro/hl/lr.html