

## Downstream Passage: At Cougar Dam

WATER FPT Update: 30 July 2014

### 1. Description and Goal/Objective:

- a. An alternatives study is being performed in-house by USACE Project Delivery Team (PDT) to develop and evaluate concepts for downstream passage at Cougar Dam.
- b. 75% Report (Sep 2011) described technical, economic, and biological evaluation for structural and operational alternatives for downstream passage at Cougar Dam.
- c. Major tasks remaining include:
  - i. 90% Engineering Documentation Report (EDR) - summarizes alternatives and documents selection of preferred alternative
  - ii. Final EDR (expected completion after COP recommendation agreed upon/accepted)

### 2. Key Milestones/Upcoming Activities:

Milestone	Date (Mo/Yr)

### 3. Issues/Changes From Previous Meetings:

- Looking at “replacement rate for the reach upstream of Cougar (working with SLAM/VSP output).
- Meeting with COP to work on the iteration (“optimization”) loop to target specific alternatives.

**Portable Floating Fish Collector**  
**WATER FTP Update: 30 July 2014**

1. Description and Goal/Objective:

The purpose of the project is to design/deploy a small-scale, portable floating fish collection device for use in Willamette Valley reservoirs. Two critical needs are expected to be addressed through deployment and operation of the facility:

1. A cost-effective means of safely collecting juvenile fish in WVP reservoirs for use in research, monitoring, and evaluation efforts.
2. Opportunity to gather information on the behavior and collection efficiency of both tagged and run-of-river fish near a small scale floating surface collector operating at different flows.

Other secondary goals are to make the system portable for use in multiple locations within various Willamette Valley reservoirs and have the ability to be independent of shore power.

Additionally, the operation and maintenance of the small experimental collector will provide useful experience and site specific information for the operation of surface collectors in Corps reservoirs, such as learning how to manage debris loading, developing moorage techniques at flood risk management projects with fluctuating pools, and gaining experience in the day-to-day operation and maintenance of a floating surface collector.

Primary species of concern that will be studied are: ESA listed Upper Willamette River (UWR) spring Chinook salmon (hatchery and natural origin), ESA listed UWR winter steelhead, potentially bull trout, as well as resident fish.

2. Key Milestones/Upcoming Activities:

- Complete & ready for use Apr 2014

3. Issues/Changes from Previous Meetings:

- The PFFC is operational.
- The PDT is identifying and scoping follow-on work.

## Detroit Long Term Temperature Control and Downstream Fish Passage Water FPT Update: July 2014

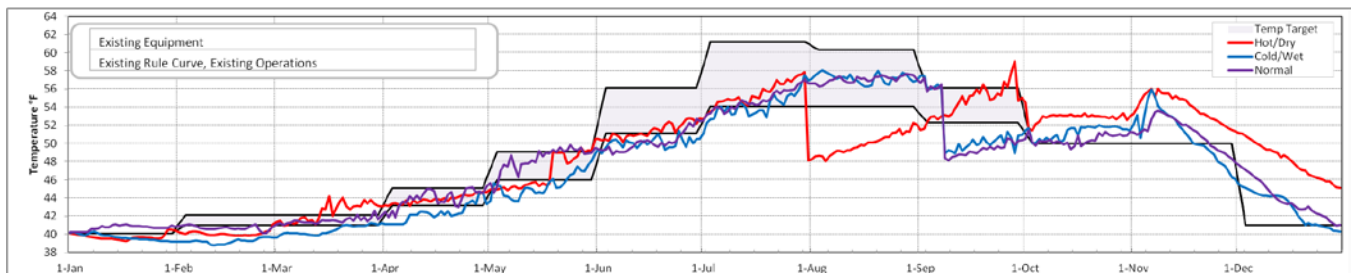
### 1. Description and Goal/Objective:

The NMFS 2008 BiOp identified the RPA to avoid jeopardy of ESA listed fish in the Willamette basin. Measure 4.12.3 of the RPA (Detroit downstream passage) requires downstream fish passage at Detroit dam by 2023. Measure (5.2) in the RPA requires the Action Agencies to minimize water quality effects associated with operations of Detroit and Big Cliff dams by making structure modifications or major operational changes. Further, Measure 5.2 directs “if feasible and more efficient to achieve both purposes through one construction project, the Action Agencies will include downstream fish passage in this effort, rather than delaying it until 2023, as stated in RPA measure 4.12.3.

The objective is to address the feasibility of and project-specific alternatives for achieving long term temperature control (e.g. using existing equipment with upgrades, or with a new permanent facility) that can provide target water temperatures for listed species in the North Santiam River, and minimize the number of TDG exceedances in the North Santiam River. The temperature control design will take into account the potential for inclusion of downstream fish passage facilities, if it is determined to be feasible to combine both structures.

This study shall develop a broad range of temperature control structures and TDG reduction alternatives, evaluate, reduce, and refine the alternatives, and present relative costs. Potential requirements and costs to model and prototype field test alternatives studied in this report are also part of the scope, but call for much less detail.

In general terms, operational temperature control is hampered by the current project configuration due to the inability to access warm water (upper part of the reservoir) when the pool falls below the spillway crest, resulting in a release of cooler water than desired in Summer/early Fall. As the pool continues to draft (per minimum outflow and/or rule curve), the warm water approaches the penstock elevation resulting in releases of warmer water than desired (early Fall/Winter)



2. Key Milestones/Upcoming Activities:

- No reviews currently scheduled, See below

3. Issues/Changes from Previous Meetings:

We are moving forward, refining parameters for the FBW with regional input and providing results to SLAM/VSP models.

Fish Passage PDT will investigate flow rates/flow nets for Floating Surface Outlet alternative (formerly known as “glory hole”). Original testing showed 400 cfs constant outflow worked (temperature wise), 1000 cfs constant outflow did not (although there was only a short window that flows needed to be reduced).

Flow net work: look at potential for FSO device to connect to Test Conduit, compare to using upper RO closer to the Penstocks.

Fish Passage PDT will also coordinate with High Head Bypass team, ensuring the specific design criteria needed at DET will be collected in that effort. If some data gaps exist, what could be “filled” with the FSO testing.

Due to authority issues, we will move the temperature control investigations back to EDR level, but continue to develop the alternatives and explore construction methods. One alternative that has limited data on is the FSO, so in addition to the flow rate/net work mentioned above, the PDTs are working with an AE to develop design concepts for the FSO. This information will provide cost information for this alternative to the COP team.

We will continue to investigate temperature control options, specifically construction methods/options. Task order has been awarded to an A/E firm to evaluate construction methods, potential mooring system, and hydraulic connections from structure to dam without transferring seismic loads.

## **Prototype High Head Bypass Water FPT Update: July 2014**

### 1. Description and Goal/Objective:

Both the Cougar Downstream Passage PDT and the Detroit Downstream Passage and Temperature Control PDT are assessing alternatives that include bypasses as a means of fish transport through/around the dam. These volitional systems would likely have lower O&M costs and may have similar or better biological performance than a non-volitional system that uses trucks to transport fish. Though high head bypass systems have been used at Willamette dams in the past none are currently in use. The reasons that they were removed from service included high injury and mortality within the bypass system, and in some cases, failure of adequate passage (upstream and down) elsewhere at the dam.

Since there are no high head bypass systems currently in use and the feasibility of constructing and operating a bypass system following current NMFS guidelines, it is recommended that a high head bypass prototype be designed and constructed to investigate the feasibility of a production system.. If successful, the prototype will facilitate attaining concurrence of a production system by WATER stakeholders.

The objective of the project is to investigate, design, and construct an experimental induction system to transport fish through/around a high head dam. This effort will need to consider:

- The design constraints for production scale bypass systems at both Cougar and Detroit
- Potential locations where such a system could feasibly be tested
- Review and consideration of the components of historic systems and performance

### 2. Key Milestones/Upcoming Activities:

- 60% Review – Comments from NMFS received – being addressed – should see responses late July/early August
- 90% Review – Late July-Early August – Will be complete EDR Document

### 3. Issues/Changes from Previous Meetings:

The PDT has determined that Green Peter provides the best test lab to collect data that would be pertinent to the other DS Passage teams, to inform their design. The 90% report in late July/early August will include the test plan, feasibility level design modifications that will be required in support of the test, and the parameters that will be an output of this test plan. The team is starting to make plans to implement this test, with the earliest testing period being May/June of 2015.

## **Middle Fork Willamette Term Temperature Control and Downstream Fish Passage Water FPT Update: July 2014**

### 1. Description and Goal/Objective:

The purpose of this study is to evaluate existing information related to downstream passage and water temperature conditions in the Middle Fork Willamette River specific to Dexter, Lookout Point, and Hills Creek dams and develop conceptual actions to address downstream passage and water temperature control for possible long-term solutions.

The Middle Fork Willamette currently is the most challenging system in regards to improving fish passage and water quality due to the interrelated and complex nature of the three dam system (Dexter/Lookout Point/Hills Creek). Habitat quality and quantity available above the dams and historic information suggests substantial production of spring Chinook could occur above the projects if adequate downstream passage and water quality conditions could be provided. Approximately 95% of the available salmonid habitat is located above Dexter Dam. Both Dexter and Lookout Point reservoirs contain exotic warm water species that may be causing high levels of reservoir mortality to juvenile spring Chinook salmon. Additionally, water temperatures under normal operations typically result in complete spring Chinook recruitment failure in the limited habitat available below Dexter Dam due to elevated temperatures in the fall during spawning and incubation.

The goals and objectives of this study are to develop long-term solutions to address downstream passage survival and water temperature improvements to increase the number of wild spring Chinook in the Middle Fork Willamette. Solutions may be structural or operational and the level of improvement for long-term solution will be determined through the COP process which will assess the technical feasibility, biological benefit, and cost to determine the proper action within this subbasin. By spring 2015, this PDT will identify a preferred alternative to address passage and water temperatures, including cost estimates. This information will be used for planning budget purposes and will also be the basis for any construction actions that may be pursued. The 2008 BiOp states that a downstream passage solution be constructed by December 2021 (if structural solution) and begin operations by March 2022.

### 2. Key Milestones/Upcoming Activities:

- 30% EDR – August for FPT review
- MF Water Temp Targets Meeting – July 24, 2014

### 3. Issues/Changes from Previous Meetings:

This team is starting to pull together available information and get report outline started. There is still uncertainty regarding project authorization.

**Temperature Targets: Regional team members assigned and first meeting set for July 24<sup>th</sup>.**

Data inventory: Fenton Khan is starting to populate a biological data inventory sheet. So far, it's fairly sparse, but it will help show the RM&E timeline for collecting the information and how that might feed into study design/implementation schedules.

Estimate power upgrades needed at LOP to power PFFC (if this is to be a testing location)

July 2014

<i>Proposed Special Operations in Support of 2014 RM&amp;E</i>						
<b>Corps Dam</b>	<b>Description of Operation</b>	<b>Goal of Operation</b>	<b>Status</b>	<b>Corps Position/Rationale</b>	<b>Likely Implementation</b>	<b>Key Issues/Information</b>
Hills Creek	Deep drawdown	Downstream fish passage	On hold	Corps would be interested in testing a deeper drawdown at Hills Creek Reservoir to study potential improvements to downstream spring Chinook salmon migration. Potential impacts to bull trout should be further investigated and documented prior to implementation.	N/A	EA has not completed due to USFWS concerns over bull trout
Lookout Point	Free spillway overflow	Downstream fish passage	Currently being assessed	Provide an un-gated flow over the spillway crest at Lookout Point Dam to encourage downstream fish passage. This operation would be similar to the free overflow spillway test implemented at Detroit Dam in past years.	2015	Implement prior to reservoir drawdown for Tainter gate repairs; planning has begun
Lookout Point	Delayed Refill (April – June)	Downstream fish passage	Currently being assessed	Delayed refill operation would be combined with free spillway overflow operations (for at least two weeks) improve outmigration of downstream migrants.	2016	Potential impacts to chub habitat d/s of LOP (due to flow and temp impacts); EA process to start in fall; sediment transport modeling work has begun
Lookout Point	Year-round minimum conservation pool	Downstream fish passage	On hold; Corps suggests taking off table	Corps does not agree that holding the reservoir at minimum conservation pool elevation year-round will improve the outmigration of downstream migrants. Available outlets (penstock and RO) will still be very deep in water column and difficult for fish to discover.	N/A	Operation does not have regional consensus
Lookout Point	Deep drawdown (would include either early drawdown or delayed refill)	Downstream fish passage & predation control	On hold	A delayed refill has been prioritized over a deep drawdown operation. A minor deep drawdown, however, may be necessary if delayed refill operation is implemented simultaneously with Tainter gate repairs.	N/A	Potential impacts to chub habitat d/s of LOP (due to sediment transport); EA process not started
Lookout Point	Operational temperature control	Temperature management	Currently being assessed for continued implementation	Corps supports the continuation of water temperature management operations at Lookout Point. It is likely that temperature management would also need to take place at Hills Creek Dam in the future. Temperature targets should be refined for this subbasin.	Implemented	Temperature targets should be reevaluated; regional water temperature target workshop scheduled for 24 July 2014.
Fall Creek	Winter deep drawdown	Downstream fish passage	Implementation to continue	Corps supports the continuation of the deep drawdown of Fall Creek dam for downstream juvenile fish passage. EA completion, Section 106 compliance and the 404 process need to be addressed and finalized prior to implementation.	2014	EA has not been finalized due to Section 106; Corps is working to complete this work prior to winter.
Detroit	Operational temperature control	Temperature management	Implementation to continue	Corps supports the continuation of water temperature management operations at Detroit Dam.	Implemented	none
Cougar	Early drawdown; target ele 1550 by Sept/Oct	Downstream fish passage	On hold	Corps does not agree with implementing an early drawdown at Cougar Dam, as this operation would impact water temperature management and the use of the WTC. Furthermore, PFFC RM&E should take precedence over next couple of years.	N/A	Operation does not have regional consensus; EA not finalized due to USFWS concerns over bull trout
Cougar	Refined RO operation combined with PFFC	Downstream fish passage	Implementation to continue	Corps supports use of ROs at night (during winter, low pool) to pass downstream migrants more safely and effectively	2014	none
Green Peter	Operational temperature control	Temperature management	On hold	Corps cannot operation Tainter gates until they have been repaired; water temperature management is not possible.	N/A	Tainter gates in need of repair



*Proposed Special Operations in Support of 2014 RM&E (cont...)*

<b>Corps Dam</b>	<b>Description of Operation</b>	<b>Goal of Operation</b>	<b>Status</b>	<b>Corps Position/Rationale</b>	<b>Likely Implementation</b>	<b>Key Issues/Information</b>
Foster	Fish weir operations (year-round)	Downstream fish passage	Implementation to continue	Corps supports the continuation of Foster fish weir operations/testing.	Implemented ; On-going through Dec 2015	none

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## **Dexter Fish Facility Upgrade Water FPT Update: July 2014**

### 1. Description and Goal/Objective:

When Dexter Dam was constructed, an adult fish collection system was included. The existing adult handling system includes an entrance on the north shore at the powerhouse, a ladder to move fish up to a presort holding pond and a processing area. The raceways as part of the current system, were initially to be used for adult holding, but very early on their use was changed to juvenile rearing. This system was constructed prior to any fish being listed under the ESA, and before the current standards for fish handling were adopted by NMFS, so the facility does not meet these requirements. One of the biggest concerns is the way water flows from the raceways into the side of the presort pool. This causes an attraction for the adult fish in the presort pool. The adult fish jump at the wall between the raceways and the presort pool, often causing injuries.

The Corps, as required in the biological opinion, plans to upgrade the existing fish collection facility at Dexter Dam to provide safe collection, handling, sorting, and transfer of wild spring Chinook, winter steelhead, hatchery summer steelhead, hatchery spring Chinook. The project design will accommodate collection of lamprey as well, if feasible.

The design will upgrade and modify the existing Dexter Fish Facility to comply with the National Marine Fisheries Service's criteria for upstream passage and adult fish facilities, unless otherwise agreed to by NMFS. The new facility should minimize stress on the fish, provide fish management flexibility by accommodating the various fish destinations, and provide safe working conditions for employees. The BiOp calls for Dexter Fish Facility to be operational by March 2015.

Due to a combination of funding issues and that until DS passage solution is determined and implemented on the MF Willamette, the majority of adult fish returning (close to 100%) are hatchery fish, this project is being shelved at the 90% P&S. Completion of the P&S and construction will be evaluated as more data/information is received.

### 2. Key Milestones/Upcoming Activities:

- 90% P&S Comment Backcheck – July 2014 (likely late July early August when agency comments will be sent back)

### 3. Issues/Changes from Previous Meetings:

- PDT almost complete with addressing 90% comments, and updating the DDR with changes found during P&S development and adding a roadmap for the future when this project is reinitiated.

**Foster Fish Facility Upgrade**  
**Water FPT Update: 30 July 2014**

1. Description and Goal/Objective:

When Foster Dam was constructed, an adult fish collection system was included. The existing adult handling system includes entrances at the powerhouse and the spillway, a ladder to move fish up under the spillway, a small holding pond and processing area, and a hopper basket and gantry crane system to off-load fish to a truck on the spillway road or into the forebay. This system was constructed prior to any fish being listed under the ESA, and before the current standards for fish handling were adopted by NMFS, so the facility does not meet these requirements.

The Corps, as required in the biological opinion, plans to upgrade the existing fish collection facility at Foster Dam to provide safe collection, handling, sorting, and transfer of wild spring Chinook, winter steelhead, hatchery summer steelhead, wild winter steelhead, and resident fish species from below Foster Dam to upstream areas or to the South Santiam Hatchery. The project design will accommodate collection of lamprey as well, if feasible. The facility will serve as a collection site for hatchery fish associated with South Santiam Hatchery (on the north side of Foster Dam), and will also serve as a “trap-and-haul” for release of adult fish into habitat upstream of Foster Dam (possibly including areas upstream of Green Peter Dam).

The design will upgrade and modify the existing Foster Fish Facility to comply with the National Marine Fisheries Service’s criteria for upstream passage and adult fish facilities, unless otherwise agreed to by NMFS. The new facility should minimize stress on the fish, provide fish management flexibility by accommodating the various fish destinations, and provide safe working conditions for employees. The BiOp calls for Foster Fish Facility to be operational by March 2014.

2. Key Milestones/Upcoming Activities:

- |                                |                           |
|--------------------------------|---------------------------|
| • Commissioning the Facility   | Major items commissioned. |
| • Facility ready for operation | March 31, 2014            |
| • Contract End Date            | August 31, 2014           |

3. Issues/Changes from Previous Meetings:

- Contractor addressing punch list items.
- A Follow-on contract mod is scheduled for fall.

**Minto Fish Collection Facility Rebuild**  
**WATER FTP Update: 30 July 2014**

1. Description and Goal/Objective:

The purpose of the Minto fish collection facility is to collect adults for the North Santiam spring Chinook program. This program requires collection of broodstock for the hatchery program and collection of other fish for transport above Big Cliff and Detroit dams to spawn naturally. The facility also handles adult winter steelhead that are released into stream habitat above Minto Dam and summer steelhead, which are recycled downstream to increase harvest opportunities, given to local food banks, or returned downstream of Minto Dam to spawn naturally. The 2008 Willamette Project Biological Opinion states a new fish collection facility that complies with National Marine Fisheries Service (NMFS) criteria for upstream passage/collection facilities must be built at Minto Pond. The fish collection facility needs to safely collect, sort, transfer, treat, spawn, and hold Chinook, summer Steelhead, and winter Steelhead. The existing Minto fish collection facility does not comply with NMFS criteria for upstream passage and collection facilities for ESA listed fish, exposes workers to falling and electrocution hazards, and cannot be operated year-round because the holding ponds become inundated during high flows. The Minto Fish Collection Facility Rebuild will provide a new fish collection facility that meets NMFS criteria for upstream passage and collection facilities for ESA listed fish and provides a safe working environment for the operators.

2. Key Milestones/Upcoming Activities:

**Minto FCF Rebuild:**

- Follow on modifications Ongoing

3. Issues/Changes from Previous Meetings:

- Follow on modifications to correct critical fish handling and safety issues are ongoing. The completion date for modification 2 is 31 Dec 2014. Mod 3 has not been issued yet and the completion date is TBD.

## Fall Creek Fish Facility

### Water FPT Update: 18 July 2014

#### 1. Description and Goal/Objective:

An Design Document Report (DDR) is complete that moves the preferred alternative forward on detailed design to upgrade the existing Fall Creek Fish Facility to improve collection, handling and sorting, and transport of ESA-listed, wild spring Chinook, wild winter steelhead, resident fish, and lamprey to areas upstream of Fall Creek Dam.

The facility should accommodate at least the following functions and consider NMFS' guidelines:

- \* Adult fish trap-and-haul for spring Chinook salmon
- \* Allow for the potential for volitional upstream passage, should it be determined feasible at a later date (per RPA requirement)
- \* Allow for the safe return of fish to the tailrace (e.g., for resident fish)
- \* Sorting of hatchery and wild fish, sorting among species (as determined)
- \* Consider the potential for facilities that hold adults prior to release into upstream habitat (if determined to decrease pre-spawning mortality)
- \* A transport/release truck(s) to release fish upstream (if needed)

#### Other considerations/coordination:

The project should be scoped and designed in close coordination with Willamette Valley Project biologists, ODFW, and NMFS, with guidance from the biological opinion. Scoping efforts, draft documents, and designs of the facility should be closely coordinated with and reviewed by the Fish Passage Team (FPT) Team within the WATER Forum, Dave Griffith.

Due to the location of the fish facility, the PDT should also closely coordinate with Willamette Valley Project staff regarding maintenance, access, dam safety, and security issues.

To the extent possible, the PDT should integrate components of the other new fish facilities in the basin (Minto, Foster, Dexter, Cougar) into the designs for the Fall Creek Fish Facility to allow compatibility of equipment, parts, personnel, etc.

The team should coordinate with the Adult Release Site team to ensure compatibility of the truck design with existing or new release sites and ensure consistent assumptions regarding management options for outplanted fish.

#### 2. Key Milestones/Upcoming Activities:

- Entrainment study- Addressing NMFS comments
- Environmental Clearance being pursued- Critical path being determined.
- Water Supply- working toward NTP 5/2015.
- Adult Ladder contract- working toward NTP 5/2016

#### 3. Issues/Changes from Previous Meetings:

- Working toward EA out for public review & MOC with State Historic Preservation Officer
- USACE Received comments on entrainment study from NMFS; based on current data PDT will proceed on design without screened intakes and continue monitoring