

**FISH SALVAGE PLAN FOR THE
DEBRIS REMOVAL AND INTAKE TOWER TRASHRACK
REPAIRS AT COUGAR DAM ON THE SOUTH FORK
MCKENZIE RIVER**



Prepared by

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INTRODUCTION

The following Fish Salvage Plan is for the specific tasks related to the lowering of Cougar reservoir due to the debris removal and intake tower trashrack repairs at Cougar Dam on the South Fork McKenzie River. The project is located within the McKenzie River watershed, East of Springfield in Lane County, Oregon.

The Corps has coordinated with the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, and with the Oregon Department of Fish and Wildlife regarding this project.

The partial drawdown of Cougar Reservoir will require outflow for the dam to be transitioned from the temperature tower regulating outlets in conjunction with the penstock outlets, to the diversion tunnel outlet. This operation will dewater the immediate area upstream of the temperature tower, herein referred to as the cul-de-sac. The operation to remove debris and repair the intake tower trashracks is scheduled to begin February 29, 2016 and last until mid-March 2016. The fish salvage operation will commence once U.S. Army Corps of Engineers (USACE) dam operators begin reducing the forebay reservoir elevation dewatering the cul-de-sac area only. There may be a small residual pool located in front of or upstream of the penstock bypass gate located on the Southeast corner of the intake tower. The elevation of this area is at El. 1400 ft. which is the lowest point around the temperature control tower. Areas located within the cul-de-sac are where fish salvage operations are expected to occur.

This fish salvage plan contains a site description, list of expected fish species present, and a fish salvage protocol.

SITE DESCRIPTION - COUGAR DAM INTAKE TOWER

The Cougar Dam powerhouse and tailrace was completed in 1963, and consists of a 452 foot high and 1,600 foot long earthen fill dam, a powerhouse with two turbine units, two regulating outlets, and an exit from the diversion tunnel extending below the dam. The area that will be dewatered is upstream of temperature control tower, referred to in this document as the intake tower. Discharge from the diversion tunnel outlet will be used to maintain base flow downstream of Cougar Dam.

FISH SPECIES POTENTIALLY AFFECTED

The South fork McKenzie River upstream of Cougar Dam and Cougar Reservoir hosts a wide variety of native and non-native fish species, to include Endangered Species Act (ESA) listed salmonids. The ESA-listed salmonids that would be affected due to the Cougar Dam special operation are threatened Upper Willamette River spring Chinook salmon (*Oncorhynchus tshawytscha*) and bull trout (*Salvelinus confluentus*). Other native fish species likely to be affected are rainbow trout (*Oncorhynchus mykiss*), cutthroat trout (*Oncorhynchus clarki*), and mountain whitefish (*Prosopium williamsoni*).

Native non-salmonid species that inhabit the site and could be affected by this operation include largescale suckers (*Catostomus macrocheilus*), sculpins (*Cottus spp.*), western brook lamprey (*Lampetra richardsonii*), and dace (*Rhinichthys spp.*)

The Cougar project also contains two known non-native fish species inhabiting Cougar reservoir and they are bluegills (*Lepomis Macrochirus*) and largemouth bass (*Micropterus salmoides*).

FISH SALVAGE PROTOCOL

Time Period and Duration - The USACE will complete the fish salvage operation as quickly as possible following the initiation of the drafting of Cougar reservoir scheduled to begin February 29, 2016. The duration of the salvage will depend on factors such as reservoir draft rate and any incoming precipitation.

Cul-de-Sac Dewatering and Fish Salvage Operation - A description of the approach we expect to implement is listed below. We will remain flexible and adapt our approach and techniques as needed to conditions encountered in the field. The following represents a general approach that will likely require some modification as it is implemented.

The USACE anticipates that the sequence for de-watering the construction area will include the following: 1) the PFFC will be moved away from the temperature tower, 2) the cul-de-sac area will be drawn down using the regulating outlet in conjunction with penstock outlets within the tower, 3) once flow from the temperature tower is no longer sufficient, the outflow from the dam will be transitioned to the diversion tunnel outlet, 4) fish will be salvaged from any remaining pools between the residual reservoir and the intake tower to include the area in front of the penstock bypass gate using angling, seine and dip nets, and other trapping devices as needed.

Below is the expected operation for fish salvage:

1. Once the reservoir elevation reaches approximately El. 1475 ft., the saddle dam will be exposed. Because the reduction in reservoir will be gradual, the slow dewatering of this habitat will allow fishes to relocate downstream into the remaining pool area outside of the tower without any significant risk of stranding, or travel back to the residual reservoir.
2. Upon dewatering the saddle dam, the USACE would open the penstock conduit to flush any remaining water from inside the intake tower. Any fish remaining would travel through the penstock conduit into the downstream tailrace of Cougar Dam.
3. To ensure that fish are not stranded during this operation, USACE personnel will thoroughly survey the cul-de-sac area between the residual reservoir and intake tower.
4. A small pool may remain flooded during the remaining construction period, but as many fish as possible will be recovered from any remaining habitat and relocated to habitat within the residual reservoir.

Capture and Transfer of Fish - Any stranded fish will be captured by any of the methods described in this document. Water temperatures and dissolved oxygen will be monitored throughout the operation of capture and transfer. If necessary, fish collection operations will be

restricted to the morning when water temperatures are coolest and would cease well before water temperatures approach 21°C. This is unlikely to occur during March.

Captured fish will be placed in buckets or other suitable containers of water and transported from the dewatered cul-de-sac area to the residual reservoir for release. Bull trout will be processed by ODFW prior to release into Cougar Reservoir. All captured fish will be transported using following criteria:

Treatment: All transport tanks will be treated with Nov-Aqua, per manufacturer's instructions, to reduce stress during transport.

Loading Density: Transport fish at a density of 0.25 cubic feet per pound of fish.

Species Segregation: Fish species will be segregated by size and type during all times of capture and transport to prevent predation or unnecessary injury.

Holding Time: Fish will be held in the transport tank no longer than one hour.

Oxygen: Oxygen levels in the water of all transport containers will be closely monitored and maintained at a range of 85- 110% saturation.

Temperature: Fish will not be released into receiving waters at any site where water temperature exceeds 21° C. If the temperature difference between the receiving water and tank water is > 2°C, the tank water will be tempered to a difference of < 2°C at a rate of 0.5°C/ 15 minutes.

Release Sites - In general, native species recovered from the dewatered area of the cul-de-sac will be released into Cougar reservoir. Fish will be able to re-enter the cul-de-sac area upstream of the temperature control tower once all debris removal and intake trash rack repairs are complete which is scheduled to occur mid-March 2016.

Final Salvage Report - The USACE will provide a summary report of the fish salvage operation occurring at Cougar Dam following the completion of the Cougar Dam debris removal and intake tower trash rack repair.