

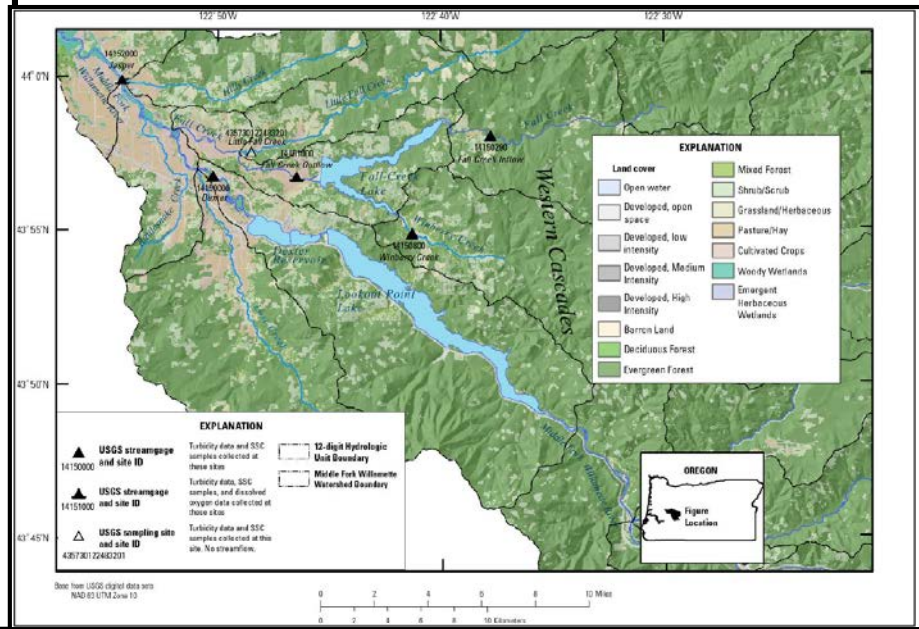
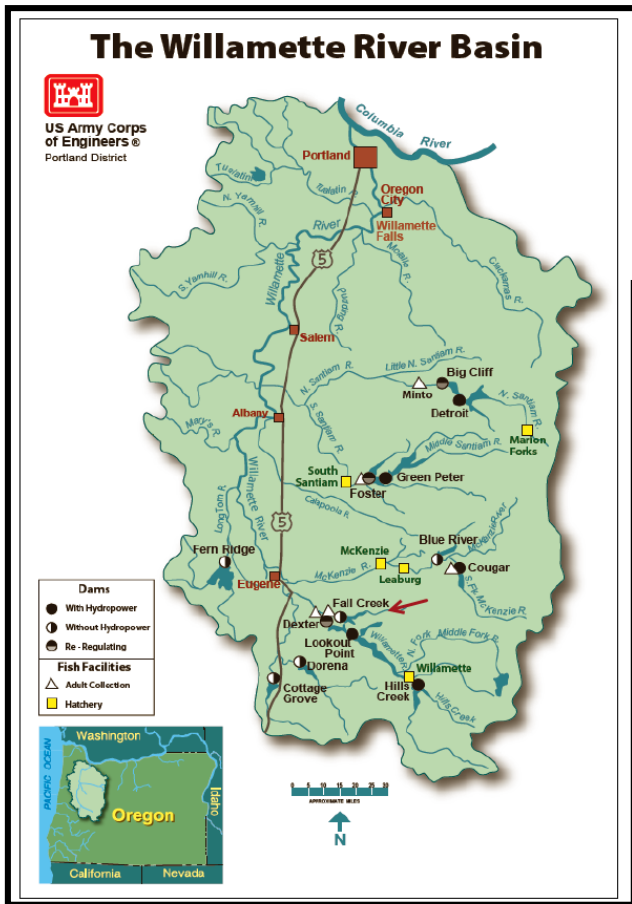


# Regional Sediment Management Program Portland District (NWP): Optimizing Fall Creek Reservoir Flush Total Maximum Daily Load (TMDL's), Oregon



## Description

Fall Creek Reservoir is the first regular US Army Corps of Engineers (USACE) reservoir flushing initiative. The Portland District (NWP) will collaborate with the US Geological Survey (USGS) to monitor the flushing event and will apply the HEC model, applying new features in HEC-RAS to evaluate Total Maximum Daily Loads (TMDLs) and automate operational alternatives. The initiative will inform future flushing events for this reservoir, larger reservoirs in the region, and will help develop the case for passive reservoir sediment management initiatives corps wide, and tools available to manage downstream effects.



## Issue/Challenge To Address

The construction of a series of hydropower facilities on the Willamette River has created challenges for Endangered Species Act (ESA) listed salmonid species. Restoring a more natural flushing pattern to mimic natural conditions provides an opportunity to deduce elevated water temperatures, and restore sediment to reaches below the reservoirs. The ESA listed species require cold water and fine areas of sedimentation for spawning.

Fall Creek Reservoir is part of a multi-reach, multi-reservoir system on the Willamette River. An operational model will help the NWP predict regional effects of these



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operations, managing for downstream concentration and deposition. Additionally, NWP is considering similar flushing operations at for environmental objectives and maintenance throughout the Willamette basin. The Willamette biological opinion recommends operational drawdowns for Lookout Point reservoir, also on the Middle Fork of the Willamette but nearly four times larger than Fall Creek.

Additionally, NWP is considering run-of-river drawdowns at Detroit and Cougar Reservoirs in this system to build fish passage and temperature control infrastructure. Developing and calibrating models for the smaller active effort at Fall Creek will inform analysis for Lookout Point, provide a scale analog for operating to optimize through-reservoir smolt survival and downstream turbidity and build stake holder confidence in our ability to predict downstream effects..

## Successes Lessons Learned

The first drawdown in 2012 resulted in the mobilization of roughly 50,000 tons of sediment. With monitoring showing that about 1/3 of this material deposited in areas downstream, resulting in the creation of salmonid spawning habitat. Run-of-the river management of the reservoirs replicates more natural conditions, enhancing conditions for salmonid survival.



## Expected Products

- Monitor Flushing Event
- A Calibrated HEC-RAS Sediment Model of Fall Creek Reservoir
- Alternative release recommendations
- Technical report

## Stakeholders/Users

NWP, USGS, ODFW, NOAA, DLCD, ODEQ, others

## Projected Benefits

This work will help develop precedent and build momentum for sustainable sediment management in Corps operated hydropower facilities. If successful the management tools could be used as a model for hydropower operations. It will demonstrate USACE capability to model and predict downstream effects of drawdown reservoir management alternatives, both for environmental and other regional sediment management objectives. The report will document Corps capacity to predict and mitigate sediment concentrations downstream of flushed reservoirs as the USACE evaluates sustainable reservoir sediment management options. This will inform similar activities considered at other dams in this system (e.g. Lookout), across the Corps (e.g. Tuttle in Kansas City (NWK), Prado in (Los Angeles) SPL, and Gavins in Omaha (NWO)), and for international USACE missions (e.g. NWO consultations on new dams in South East Asia).



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## Leveraging Opportunities

This effort will leverage an >\$350K USACE investment, converting USGS collected data between 2012 and 2015 into an operational tool with value to the USACE.

## Points of Contact

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## Participating Partners

USGS, others