

John Day Drawdown

It has been proposed that a drawdown of the 76 mile John Day reservoir might provide substantial improvements in migration and rearing conditions of juvenile salmon by increasing river velocity, reducing water temperature and dissolved gas, and by restoring riverine habitat. It might also improve spawning conditions for adult fall Chinook by restoring spawning habitat and natural flow regimes needed for successful incubation and emergence. There were two proposed scenarios for drawdown. One scenario would be to lower the river to the spillway crest of John Day Dam, while the other scenario would lower the river to natural river levels. The purpose of the study was to evaluate the social and economic impacts of the proposed drawdowns. This included impacts to irrigation operations, hydraulics and hydrology, fisheries, flood control, hydropower production, navigation, transportation, structural changes to federal projects, recreational activities, and municipal water supply.

An HEC-RAS model of the John Day reach was developed for natural river, spillway free flow, and existing conditions. The HEC-RAS model was used to determine the water surface elevations, travel time, storage, and velocity for the three scenarios for a variety of different flows. This information was then be used to quantify many of the impacts of the drawdown. A UNET model was then developed for the same three conditions, for a variety of historical inflow hydrographs at the upstream end of the pool. The UNET model aided in assessing impacts to flood control, navigation, dam safety, stability of embankment structures, and to determine flood warning times for communities and ports along the river.

Additionally, an analysis of tributary hydraulic structures, such as bridges and culverts, was conducted. This was done to determine the potential impacts of drawdown on the integrity of these structures as well as the potential for the structures to become barriers to fish passage. Finally, hydraulic and sediment transport analyses were conducted to determine the impact of drawdown on fish passage into the reservoir tributaries.



Project Owner:

Portland District Corps of Engineers
P.O. Box 2946
Portland, OR 97208
Contact: Bruce Duffe
(503)808-4889

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