

Indefinite Delivery Contract Portland District Corps of Engineers

It has been proposed that a drawdown of the 76 mile John Day reservoir may 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 may also improve spawning conditions for adult fall Chinook by restoring spawning habitat and natural flow regimes needed for successful incubation and emergence. There are 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 is to evaluate the social and economic impacts of the proposed drawdowns. This includes 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 can 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 can further aid in assessing impacts to flood control, navigation, dam safety, stability of embankment structures, and can determine flood warning times for communities and ports along the river.



Additionally, an analysis of tributary hydraulic structures, such as bridges and culverts, is being conducted. This will be 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. Also, hydraulic and sediment transport analyses are being conducted to determine the impact of drawdown on fish passage into the reservoir tributaries.

Other studies include:

- The development of a sediment budget for Mount St. Helens. This includes HEC-6 modeling and an overall geomorphic assessment of the debris avalanche
- The development of a new Water Control Manual for Willow Creek Dam. An HMS model is being developed for the watershed.
- 1-D MIKE II modeling of about 30 miles of the Tillamook River System, including a tidal boundary in Tillamook Bay.
- WEST Consultants assisted subcontractors with offshore sediment data collection (1) to characterize the sediment deposition patterns following dredge disposal off Coos Bay, OR, and (2) to characterize sediment flow patterns at the mouth of the Columbia River estuary.

Project Owner:

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Completion Date: *March 2002*