Technology Innovation Project

Project Brief

TIP 276: Enhanced Monitoring and Investigation of the Spread and Potential Impact of Aquatic Invasive Mussels in the Columbia River Basin, with Special Reference to Mitigation and Placement of Boat Cleaning Stations

Context

One of the technical priorities for BPA is to adequately maintain and update hydropower equipment in the Federal Columbia River Power System (FCRPS). A major challenge to the effective operation of the FRCPS is the presence and colonization of invasive aquatic species (AIS) that can potentially reduce efficiency and require significant and costly mitigation efforts. Zebra and quagga mussels have recently invaded many western water bodies (but not yet the Columbia River Basin (CRB)), causing extensive economic and environmental damage. Research is required to develop methods for preventing the mussels' spread, to allow early detection, and to define strategies for controlling and managing hydroelectric, irrigation and urban water facilities if the mussels are introduced to the CRB. There is currently no comprehensive, coordinated plan in the CRB that ensures adequate monitoring of potential establishment sites or that prioritizes monitoring activities based on risk.

Description

This project expands existing efforts by Washington State University (WSU) and the United States Geological Survey (USGS) to establish the following:

1. Enhance an integrated AIS monitoring and information system that has been developed by the USGS and WSU in collaboration with the Pacific States Marine Fisheries Commission
2. Enhance and further coordinate existing early detection efforts
3. Provide a Geographic Information System layer describing all of the river access points on the mainstem Columbia and Snake Rivers and major tributaries and research and report current understanding of the relative use of these river access points
4. Conduct research that will help to assess the cause and effects of biological invasions in the CRB
5. Train young professionals in assessing the effects of AIS on food webs.

The results of this project will have several direct applications; for example, to prioritize areas for the installation of boat cleaning stations in the CRB. The prioritization can be based on the levels of use of a particular boat cleaning station, on the relative risk to a hydroelectric facility based on the proximity of the access point to the facility, on the risk to a particularly sensitive ecosystem, or any combination of the above.

Why It Matters

Zebra and quagga mussels have caused several billion dollars of damage to water infrastructure in the Great Lakes, including municipal water supplies and agricultural irrigation facilities. If an invasion by these mussels into the CRB were to go unchecked, economic costs to BPA's hydropower infrastructure could easily climb to 10's or 100's of millions of dollars or more, along with devastating consequences for the environment.

Enhancing existing CRB AIS information system will provide up-to-date information on all monitoring activities, improve the ability to implement more cost-effective programs, and ensure that gaps in data collection are prioritized according to their relative risk of introduction and establishment.

For BPA Power Services, knowing which BPA facilities are most at risk will allow for better planning of maintenance, repair and replacement schedules. For BPA Environment, Fish and Wildlife, having a better understanding of the food web effects of AIS, and the potential impacts on listed species, such as salmon, will assist BPA and other agencies in predicting and managing these species and their habitats.

Goals and Objectives

The objective of this project is to provide BPA with products and tools to help delay the arrival and spread of zebra and quagga mussels to the Columbia River Basin (CRB) so that impacts to the Federal Columbia River Power System (FCRPS) are minimized; and to improve the efficacy of boat cleaning stations once they are developed by providing a basis for prioritizing their placement.

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Project Start Date: October 4, 2012

Project End Date: September 30, 2014

Funding

Total Project Cost:	$1,195,727
BPA Share:	$570,317
External Share:	$625,410
BPA FY2014 Budget:	$180,054

Reports & References (Optional)

Links (Optional)

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Participating Organizations

Washington State University Vancouver
USGS Columbia River Research Lab