OAK RIDGE NATIONAL LABORATORY

Documenting National Fish Passage Data



Hydropower dams are a critical part of our nation's infrastructure, providing power generation, flood control, recreational services, and much more. However, these dams also fragment river systems and present challenges for migratory fish species to move long distances to complete their life histories. Over the years a variety of technologies and operational strategies—collectively known as fish passage facilities—have been deployed at hydropower dams across the United States to allow migratory fish to move up and downstream across dams, and to mitigate the effects of these barriers. However, comprehensive information on the locations and types of these facilities at a national scale is incomplete. Hydropower stakeholders, therefore, cannot easily assess the status and nature of fish passage or accurately plan for building, operating, and maintaining potential new fish passage operations at hydropower dams.

Filling a Critical Data Gap

To address this critical data gap, researchers at the US Department of Energy's Oak Ridge National Laboratory (ORNL) have begun developing the first central database for fish passage facilities deployed at hydropower developments across the United States. This database will break down information silos to accelerate progress through the initial stages of dam construction and overhaul projects, thereby improving cost estimates and reducing licensing timelines. To strengthen the project, ORNL is partnering with fish passage engineers at the US Fish and Wildlife Service and the National Oceanic and Atmospheric Administration and with hydropower experts at the Low Impact Hydropower Institute.

Three Primary Goals

- **Obtain greater detail** on fish passage locations, technologies, and operations currently deployed across the United States. ORNL is first securing publicly available data from project partners and hydropower licensing documents filed with the Federal Energy Regulatory Commission.
- **Engage with industry** to obtain information on the costs to construct, operate, and maintain such technologies. Researchers will administer an online questionnaire to hydropower owners and operators to gather current information on deployed fish passage facilities, including technical and engineering features and costs.
- **Compile a list** of performance studies of fish passage facilities conducted at each hydropower development.

PRIMARY GOALS

COLLECT DATA on US fish passage facilities

ENGAGE WITH INDUSTRY to understand costs

COMPILE A LIST of fish passage performance studies

Setting the Stage

ORNL researchers have developed and are expanding a web-based map of fish passage facilities at hydropower developments across the US's 48 contiguous states. This map provides a foundation on which to build the national-scale database and is expected to reveal the most efficient methodologies for aggregating data on fish passage facilities and the number of performance studies that have been conducted. The map displays hydropower developments overlaid on river and stream data from the US Geological Survey's National Hydrography Dataset, which will enable assessments of potential connectivity to other hydropower developments within the watershed.

Expected Impacts

Hydropower plays a pivotal role in resilient domestic energy production. Hydropower's continued contributions to the US power grid require a thorough understanding of the effects of hydropower dams on aquatic species living in these areas. Creation of a national database of fish passage technologies and operational strategies is expected to assist hydropower stakeholders in planning projects more efficiently and effectively than in the past and to better anticipate costs required for construction, operation, and maintenance. This information will improve the understanding of potential connectivity at larger spatial scales across hydropower developments, which may also provide key insights into how best to secure safe ecological habitats for species that reside in nearby rivers and reservoirs.

Join Us

If you own or operate a hydropower dam with a fish passage facility or have information on facilities and/or passage performance studies, you can help researchers compile relevant information and findings. Please contact ORNL's researcher Paul Matson at **matsonpg@ornl.gov** to participate.



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