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Eel Passage Research Center

American and European eel are species of concern across their respective ranges and are classified as endangered in many Jurisdictions

- Address a major fish passage issue faced by hydropower projects on rivers that drain to the North Atlantic.
- Conduct research to provide safe downstream passage of eels at operating hydroelectric plants
- Stay current on the state of the art in downstream eel passage technologies

Background, Objectives, and New Learning

Downstream passage of eels at hydroelectric projects is a concern in several regions of the world, including the Atlantic Coasts of North America, Europe, Scandinavia, and the British Isles; as well as Australia, New Zealand, and New Guinea. The concern is perhaps greatest for the closely-related species of the North Atlantic – the American eel and the European eel. The European eel is listed as critically endangered by the European Union and Norway, and the American eel faces possible listing under the Canadian Species at Risk Act. Currently, the American eel is listed as endangered by the Ontario provincial government. In late 2014, the International Union for the Conservation of Nature (IUCN, "Red List") classified the American eel as endangered. The U.S. Fish and Wildlife Service announced on October 7, 2015, in a decision known as a 12-month finding, that listing of American eel as threatened under the United States Endangered Species Act is not warranted; however, the Service did recommend continued efforts to improve river passage for migrating eels. Thus, hydropower projects distributed over the portions of North America, Europe, Scandinavia, and the British Isles draining to the Atlantic Ocean face mandates to provide safe passage for eels.

Upstream passage for juvenile eel at hydroelectric projects is relatively straightforward, with established design and operational parameters for eel ladders. However, downstream passage of adults at hydroelectric projects has proven to be problematic, especially at larger facilities with deep and wide intake structures. Behavioral characteristics of eels during downstream migration make turbine passage protection and guidance to alternative passage routes challenging. Currently, no effective method exists to safely pass eels around large, operating hydroelectric facilities. Measures mandated at some smaller facilities are also problematic for plant operators due to the episodic nature of outmigration and the lack of effective protection and passage technologies. As regulators and fisheries managers mandate upstream eel passage, there is the expectation that downstream passage measures will be implemented in the future when the eels passed upstream mature and migrate downstream to the sea.

Research is needed to develop economical means that are biologically- and operationally-effective in passing downstream migrating adult eels at large- and medium-sized hydroelectric facilities. EPRI will help meet this research need by continuing the Eel Passage Research Center for a second five-year term. This multinational effort will build upon previous research by the Eel Passage Research Center and others to investigate and develop means to guide and collect eels for transport below hydroelectric facilities.

Benefits

Hydropower projects distributed over the portions of North America, Europe, Scandinavia, and the British Isles draining to the Atlantic Ocean face mandates to provide safe downstream passage for eels. This project provides an opportunity to contribute to and benefit from research that addresses this risk to hydropower plant operations. Project results will provide value by helping hydropower facilities:

- Meet future downstream passage requirements
- Avoid costly operational changes such as shutdown
- Avoid problematic structural changes such as full intake screening

Project Approach and Summary

The Eel Passage Research Center will conduct baseline studies and design work in 2019 and begin the major field-based studies portion of this project in 2020. The scope of the collaborative research will be developed in consultation with the Center funders as well as regulatory and resource management agencies with responsibilities for eel protection and management. Periodic (approximately bi-weekly) webcasts will be held to convene participants and exchange information, plan research, and deliver results.

Additional meetings and site visits will be organized as appropriate, including at least one meeting of project sponsors annually. Research projects will develop and demonstrate methods to guide adult migrating eels to potential collection sites. Behavioral guidance stimuli investigated may include:

- Electricity
- Light
- Sound

Methods for monitoring behavior of and collecting migrating eels for transport around hydropower facilities may also be investigated. Debris loading is a significant issue in the St. Lawrence River and elsewhere and likely will be investigated.

Uncertainty exists regarding the design and efficacy of potential guidance and collection technologies. Consequently, R&D will be adaptively managed.

Deliverables

- Annual technical updates
- Final project-level reports
- Periodic webcasts and meetings as appropriate

Price of Project

The price to participate as a Tier 1 member is $250,000 USD per year for five years. Tier 1 members provide project governance over direction and scope, receive access to design plans and test results, and have real time access to research facilities as the research is conducted. Tier 2 members (companies with an interest in downstream eel passage but no obligation to engage in research as a license condition) may participate at a price of $80,000 USD per year for five years. EPRI members that fund any EPRI program can use Tailored Collaboration (TC) funds for up to half their contribution or Self Directed Funds (SDF) to participate.

Project Status and Schedule

The Eel Passage Research Center will commence research activities in 2019. Research and reporting will continue through 2023.

Who Should Join

Participation is open to any organization with interest in downstream eel passage technology. Organizations with hydropower facilities within the geographic range of an eel species should consider joining this supplemental project.

Contact Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

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