



Investigating fish passage decision-making in the FERC regulated hydropower relicensing process

1. Characterize the suite of social and technical factors that influence the implementation of fish passage prescriptions including the regulatory and non-regulatory tools afforded by the existing legal/regulatory framework.
2. Assess basin-wide decision-making and the degree to which regulatory decisions at dams are independent of the characteristics and regulation in other nearby dams.
3. Evaluate the construction and use of ecological information, environmental studies, and the valuation of "best available science" as it pertains to unique stakeholder groups
4. Communicate results to resource agencies to inform future relicensing decisions

Decision-making regarding dams in New England stands at a crossroad. Many dams in Maine, New Hampshire, and Rhode Island will require FERC relicensing in the next decade, many are approaching their design life, and preferences for dams and ecosystem services are changing. However, despite increased momentum for change and renewed calls to consider a broader range of options including removal, dams remain a symbol of cultural identity, economic prosperity, and technological innovation; they represent a source for clean energy and an opportunity for recreation. Placed squarely at the center of the contentious debate are numerous federal and state resource and regulatory agencies charged with the difficult task of balancing ecological, economic, and social tradeoffs related to dam relicensing decisions.

Numerous federal and state agencies assert jurisdiction over dam projects, and a confusing array of laws and policies inform dam relicensing, removal, retrofit, and on-going operations. Through interagency coordination and engagement with stakeholders including private landowners, non-governmental organizations, municipal governments, and industry, agencies have the capacity to mobilize action at the basin-wide scale using a range of regulatory and non-regulatory tools. The use of science-based information

is key to making well-informed decisions and conceptual "blueprints" for basin-scale hydropower development have been introduced.

To date, these decision frameworks have proven difficult to implement in practice. Instead, agency actions tend to be case-specific and reactive to individual projects and events rather than proactive, considering alternative actions and consequences before issues reach a boiling point. This research attempts to characterize agency actions and perspectives including knowledge gaps and challenges faced in the relicensing process.

Work began in 2017 and has focused on content analysis of document sources for 47 projects in the Kennebec and Penobscot River watersheds. A database of fish passage related correspondences, comments, and official documents relating to hydropower energy projects was constructed from the FERC eLibrary. From these sources, technical and social correlates are being quantified in relation to regulatory outcomes. A targeted content analysis of these sources is being used utilizing machine learning techniques to characterize the roles of agencies and tribal entities, entity participation, and agency decision-making behaviors. The use of science in decision-making has been identified as an important component of the relicensing process. Citation analysis is being used to identify major sources of knowledge used in the process, where it originates from, and how it is used. Knowledge of these patterns may inform future relicensing efforts.

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