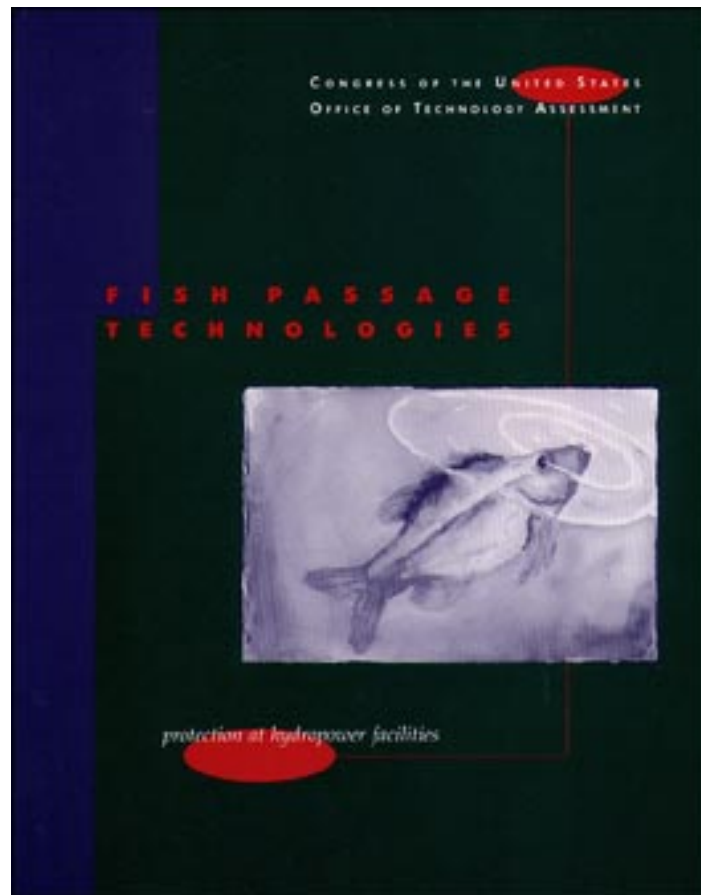


*Fish Passage Technologies: Protection at
Hydropower Facilities*

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Foreword

The House Committee on Merchant Marine and Fisheries requested that the Office of Technology Assessment (OTA) examine the role of fish passage and protection technologies in addressing the adverse effects of hydropower development on North American fish populations. After the elimination of the requesting committee, the report was continued on behalf of the House Resources Committee, Subcommittee on Fisheries, Wildlife, and Oceans.

Hydropower development may adversely affect fish by blocking or impeding biologically significant movements, and altering the quantity, quality, and accessibility of necessary habitat. Fish moving downstream that pass through hydropower turbines can be injured or killed, and the inability of fish to pass upstream of hydropower projects prohibits them from reaching spawning grounds. Hydropower licenses issued by the Federal Energy Regulatory Commission (FERC) may include requirements for owners/operators to implement fish passage technologies or other measures to protect, enhance, or mitigate damages to fish and wildlife, as identified by the federal resource agencies. Although FERC is directed to balance developmental and nondevelopmental values in licensing decisions, many contend that balancing has been inadequate. Thus, fish passage and protection has become a major controversy between the hydropower industry and resource agencies.

This report describes technologies for fish passage, and those for protection against turbine entrainment and mortality, with an emphasis on FERC-licensed hydropower projects. OTA identifies three areas for policy improvements. First, to establish and maintain sustainable fisheries, goals for protection and restoration of fish resources need to be clarified and strengthened through policy shifts and additional research. Secondly, increased coordination is needed among fishway design engineers, fisheries biologists, and hydropower operators, especially during the design and construction phases of fish passage and protection technologies, to improve efficiency. Finally, new initiatives with strong science and evaluation components are needed to advance fish passage technologies, especially for safe downstream passage.

OTA sincerely appreciates the contributions of the advisory panel, workshop participants, contractors, and reviewers. We are especially grateful for the time and effort donated by the federal and state resource agencies and the Federal Energy Regulatory Commission. The information and assistance provided by all of these individuals was invaluable.



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