

STEPHEN H. ARNOLD

Senior Aquatic Scientist
Key Species: Lake Sturgeon

CONTACT INFORMATION

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EDUCATION

M.S., Biology - Aquatic Ecology, Michigan Technological University, Houghton, Michigan, 1981

B.S., Natural Resources - Fishery Biology, University of Michigan, Ann Arbor, Michigan, 1979

B.A., Biology, Cum Laude, Northland College, Ashland, Wisconsin, 1979

PROFESSIONAL REGISTRATIONS AND AFFILIATIONS

American Fisheries Society: National, Atlantic International, Southern New England, New York Chapters, and Bioengineering Section

Albert Hazzard Award: 1982 recipient - Presented by the Michigan Chapter of the American Fisheries Society, for excellence in fishery and aquatic science graduate research

SPECIALIZED TRAINING AND CERTIFICATIONS

Colorado State University - Instream Flow Incremental Methodology:

- IF 200 - Designing and Conducting Studies using IFIM
- IF 201 - Problem Solving with the IFIM

University of Wisconsin - Madison, College of Engineering, Engineering Innovative Fish Passage, October 21-24, 2002

American Fisheries Society - Science, Tools, and Information Resources for Downstream Fish Passage, September 12, 2010

INDUSTRY TENURE

29 Years



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Experience Overview

Mr. Arnold has over 29 years of aquatic ecology and fisheries experience, including passage assessments for target species such as lake, American, and shortnose sturgeon. He has been involved in assessments of eel passage and entrainment studies, upstream and downstream fishway design, general fish population, and habitat assessments at over 90 hydroelectric developments.

Project Experience

Oswegatchie Hydroelectric Project, Fish Passage Studies, New York, Brookfield Renewable Power, Inc. Senior Fisheries Consultant for Federal Energy Regulatory Commission (FERC) relicensing of this six-development hydropower project. Provided senior technical oversight on fish passage issues for lake sturgeon, American eel, and other fisheries resources.

Holyoke Dam/Hadley Falls Station, Fish Passage Design, Massachusetts, Holyoke Gas & Electric. Fisheries Consultant for the conceptual design of an intake trashrack replacement, incorporating fish exclusion and downstream passage enhancements. Worked with a team of engineers and fisheries scientists to develop an inclined sloping trashrack structure designed to reduce fish entrainment probability and enhance downstream passage of both surface-oriented species (Atlantic salmon, American shad, and river herring) and bottom-oriented species (shortnose sturgeon and American eel). Assisted with resource agency consultation and negotiation of design characteristics.

New Savannah Bluff Lock and Dam, Fish Passage Design, Georgia, U.S. Army Corps of Engineers, Mobile and Savannah Districts. Lead Fisheries Biologist for the development of fish passage designs. Worked with interdisciplinary team to develop the best adapted fish passage design. Target species included all resident fish and anadromous species, including two imperiled species (shortnose sturgeon and robust redhorse). Tasks included screening and ranking of available fish passage technologies, two rounds of federal and state resource agency consultation, and development of engineering design to the 35-percent level of the preferred alternative fishway. The final design selected was a rock-ramp-nature-like fish bypass channel.

Yadkin-Pee Dee River Hydroelectric Project, Aquatic Resource Studies, North Carolina, Progress Energy. Lead Aquatic Scientist for FERC relicensing of this two-development project. Duties included relicensing strategy and study development, and participation in aquatic resource assessments. Areas of focus included endangered or imperiled fish species (shortnose sturgeon and robust redhorse), anadromous fish populations and fishways, reservoir fisheries, and aquatic habitat. Provided technical information to support comprehensive settlement agreement and fish passage negotiations with federal agencies having Section 18 prescriptive authority under the U.S. Federal Power Act.

Basin Mills Hydroelectric Project, MDEP Section 401 Testimony, Maine, Bangor Hydro-Electric Company. Project Scientist providing testimony in support of the project before the Maine Board of Environmental Protection for Section 401 Water Quality Certification and state hydropower permitting. Testimony concerned project effects on shortnose sturgeon, Atlantic sturgeon, American shad, alewife, blueback herring, striped bass, rainbow smelt, and smallmouth bass populations. Provided strategic assistance on fishery issues to legal counsel before and during hearings.

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Description of Expertise and Experience with the Relevant Species/Grouping of Species

Mr. Arnold has provided senior technical oversight on multiple hydropower fish passage issues for lake, Atlantic, and shortnose sturgeon, including collaborating with engineers and fisheries scientists to develop structures to reduce entrainment probability and enhance downstream passage. This includes screening and ranking of available fish passage technologies, providing federal and state resource agency consultation, and direct involvement in comprehensive settlement agreement and fish passage negotiations with federal agencies having Section 18 prescriptive authority under the U.S. Federal Power Act. He has also provided testimony concerning project effects on Atlantic and shortnose sturgeon before state environmental boards in support of hydropower permitting efforts.

Description of Expertise and Experience in Development and Implementation of Mitigation, Effects Monitoring, and Effectiveness Monitoring Plans

Mr. Arnold's expertise includes working closely with engineers, fishery scientists, and regulators to develop tailored mitigation strategies and enhancement measures for downstream passage of multiple fish species. His experience includes extensive consultation with federal and state resource agencies on the development, implementation and monitoring of sturgeon species management and mitigation efforts. This includes study plan development and participation in aquatic resource assessments of sturgeon species and the development of solutions that meet regulatory requirements while meeting energy facility operational needs.

Description of Expertise and Experience in the Hydroelectric Sector

Mr. Arnold has supported conventional, pumped storage, and tidal energy hydroelectric project owners, operators, and developers on fisheries issues for over 29 years. He has comprehensive FERC licensing and relicensing experience including involvement with FERC's Traditional (TLP), Alternative (ALP), and Integrated (ILP) licensing processes. He has participated in study planning and execution, resource agency consultation efforts and negotiations, public meetings and settlement negotiations, and has provided testimony as an expert witness during hydroelectric project licensing and relicensing efforts. He has worked on the regulatory processes involved with fish passage planning strategy and on the biological/engineering aspects of fish passage implementation throughout the eastern U.S.