

EPRI-sponsored Laboratory Evaluation of Fine-mesh Traveling Screens for Protecting Larval Fish at Cooling Water Intake Structures

Background

Of the limited number of technological options available to reduce entrainment, several have engineering constraints that may reduce their broad-scale application (e.g., Aquatic filter barriers (AFB) require a large deployment area and wedgewire screens cannot be located close to navigation channels). Technologies that can be deployed in existing intakes bays with minimal structural modifications have the greatest potential for wide-scale application, because they are relative easy to retrofit.



Fine-mesh Testing Facility – Alden

The biological effectiveness at the few existing facilities that are using fine-mesh screens has been highly variable. It is unclear whether the this variable performance is because larval fish are intolerant of impingement on fine-mesh screens or other factors such as debris, extremes in environmental conditions, poor evaluator handling, or death of organisms prior to impingement are obscuring the true performance of these screens.

Therefore, a multi-year study was undertaken at Alden for the Electric Power Research Institute (EPRI) to address these issues.



Photo Credit:

www.fishwild.vt.edu/aquaculture_center/images/

Objectives

The main objective of the study is to determine the post-collection survival of larval fish when exposed to compounding stresses of screen impingement and transfer. In particular, the project seeks to determine the effects of water velocity and duration of impingement on survival.

Preliminary Results

- Survival was variable by species. The highest survival observed was for channel catfish.
- There was a trend toward decreased survival at higher velocity and longer duration of impingement.
- In general survival increased as fish developed i.e., bigger fish had higher survival. However, there was a drop in survival for some species during transition from yolk-sac to post yolk-sac
- Screens continue to improve. Modifications to screen designs between testing years increased the survival of some species.