Downstream Passage Survival of Adult American Eel at the School Street Hydroelectric Project Cohoes, NY

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Introduction

School Street Project

Brookfield Renewable Power

– Issued a new FERC License on February 15, 2007
  • Downstream fish passage for anadromous and catadromous fish, as well as resident fish, was required as part of the new license.

– Evaluation of downstream fish passage
  • Conducted a *Release-Recapture* Study to evaluate bypass survival of adult American eel.
Mohawk River, 2.5 river miles upstream of its confluence with the Hudson River in Cohoes, New York
Project Information

Consists of:

- a stone masonry gravity dam, 16 ft in height, extending 1,280 ft across the Mohawk River
- The dam constructed in 1865
- The reservoir has a surface area of 100 acres and a gross storage capacity of 788 acre-ft
- an upper and lower gatehouse
- a power canal extending approximately 4,400 ft from the dam to the powerhouse
- a powerhouse with 5 vertical shaft Francis turbines rated at 92 ft of head with a total power capacity of 38.8 megawatts
Fish Passage Facilities

Consist of:

– an angled bar rack with one inch clear spacing and a fish conveyance system
Conveyance System

• Located near the downstream end of the angled bar rack
• Two intake portals and a multi-level gate with top and bottom entrances
Fish Separation Chamber
Fish Return

Discharge ~ 45 CFS at 47 ft/s
Drop ~ 90 ft
Study Design and Methods

• Study Objectives
  – Assess the survival of out-migrating Adult American eel by conducting a release-recapture study
  – Inject test eel into the fishway and recover them in the Project tailrace in a manor that minimizes injury/mortality due to re-collection stresses
  – Evaluate the survival rate of eel that have been subjected to the stresses of the fishway in order to estimate Project passage survival.
Test Eels

- Collection efforts 2009 and 2010 were unsuccessful due to the limited availability
- In 2011, 150 eel were purchased from a commercial fishery on the Sebasticook River, ME weighing 413 pound
- Average weight 2.75 pounds
- Transported via truck to Conroy’s bait in Cohoes, NY
Test Eels

- A subsample (45) was tested for pathogens as required by NY state law.
- Pathogen testing was conducted by Kennebec River Biosciences and included:
  - viral hemorrhagic septicemia (VHS), Spring Viremia of Carp Virus, Furunculosis, Enteric Red Mouth, and Infectious Pancreatic Necrosis (IPN).
- Required a 30+ day holding period (days held 42).
- All tests were negative - eels safe for use.
- Sample size (n=105) test eels.
Re-capture

• A custom net pen was designed and constructed
• The net pen design took into account:
  – the need to capture the entire discharge of the fish bypass flow
  – the need to eliminate or otherwise minimize re-capture related stress and mortality
  – fish retention
  – logistical considerations
Net Pen

- Floating net pen
- Dimensions: 28’ L x 12’ W x 6’ D
- Floating work platforms
Net Pen Deployment
Floating Support Dock
Net Pen Deployment
Net Pen Deployment
Net Pen Deployment
Net Pen Deployment
Test Trial

• The evaluation was conducted on October 12 and 13, 2011.
• 105 test eels were injected into the weir pool, recaptured using the custom net pen and held overnight (15.5 hrs) to assess latent mortality.
• Eels were assessed as *Alive or Dead*. 
Results

• Survival (n= 56) – 100%
Conclusion

• The recently installed downstream bypass at the School Street Project effectively passes adult emigrating American eels as evident by the 100% survival result.

• This result suggests that bypass survival is not a limiting factor to successful downstream passage at the Project.

• Though recapture efficiency was less than anticipated, a large group (n=56) were tested and were representative of survival at the Project.
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