



The Acoustic Tag Update

Project Location:
Turner Falls, Massachusetts
U.S.A.



Cabot Station, Turner Falls, Massachusetts

Investigating downstream passage of adult, silver-phase American eels

Over the last two decades, scientists have found the abundance of American eel (*Anguilla rostrata*) in the northwest Atlantic in serious decline, so much of a decline, in fact, the eels are presently under consideration for Endangered Species Act listing. A multitude of factors appear to contribute to the decline but, to what degree?

Up until most recently, information about eel behavior passing downstream of dams has been limited. In 2002 and 2003, Leah Brown, then a masters student at the University of Massachusetts and fisheries biologist at the USGS S.O. Conte Anadromous Fish Research Center (CAFRC), used acoustic telemetry to investigate their behavior. Her project was situated along the Connecticut River in the northwestern part of Massachusetts, at Cabot Station. It is one of Massachusetts' 108 hydroelectric facilities.

Fifty eels were surgically implanted with HTI's *Model 795 Acoustic Tags* and monitored in the forebay (the first 100 m of area located directly upstream of the project). The study helped shed light on how the eels were choosing to pass the dam. The acoustic tags were remotely tracked using HTI's *Model 290 Acoustic Tag Receiver* with eight hydrophones. Each eel location was revealed every 3 seconds. Resulting tag positions were plotted in 3D revealing the fine scale movement of each tracked eel. From those data,

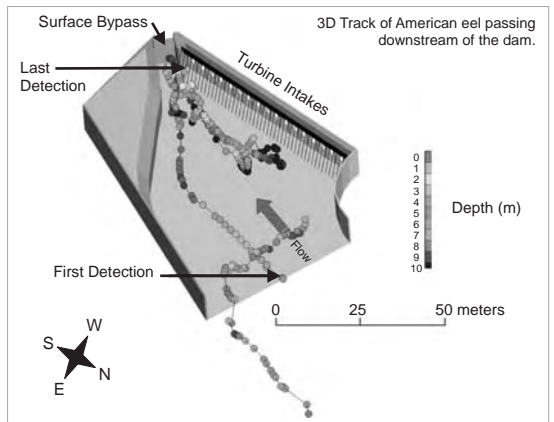
they found that the eels occupied a variety of depths throughout the forebay; however, their greatest proportion of time was spent near the bottom. The eels occupied the middle and upper water column more frequently and displayed an increase in turning movement immediately upstream of the trash racks (first 5 m; average 3D turning angle increased from 56.3° to 97.8°).

The increase in surface orientation and elevated turning angle was increased by the vertical and horizontal searching behavior in this area. Additional behavioral trends were observed: quick, upstream movements after eels encountered the trash racks vertical and horizontal changes in position at or near the trash racks that often covered the entire forebay as well as small areas directly upstream of the trash racks. Eels appeared to be volitionally choosing the turbines as their preferred downstream passage route based on dominant flow.

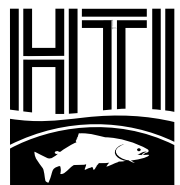
According to Dr. Alex Haro, the principle investor on this project at USGS CAFRC, "This study enabled us to obtain detailed, previously unknown behavioral responses of eels to forebay conditions". HTI was happy to provide accurate tracking technology for this study. For more about the equipment and techniques used, visit www.HTIsonar.com or call us at 206-633-3383.



Leah Brown surgically implanting an acoustic tag into an anesthetized eel



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