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Saw Kill Studies

Progress Report for June 2020

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Hudsonia

Prepared under Agreement 98825

between Bard College and the New York State Energy Research and Development Authority

19 July 2020

Introduction

This progress report notes pre-case surveys of American eel and other fishes, Louisiana waterthrush, wood turtle (pending), and plants along the Saw Kill, as well as installation and operation of an automatic water quality monitoring station at the Annandale Dam. The surveys will be repeated in the first season after the turbines become operational at the Annandale Dam, hopefully in spring and summer 2021. Water quality will be monitored continuously except during winter.

We have focused the biological surveys on flora and fauna that are uncommon or rare, or of conservation concern for other reasons (e.g., the range-wide decline of American eel on the U.S. East Coast). It is these organisms that are potentially vulnerable to impacts of the micro-hydropower facility to be built in Annandale.

Annandale Dam Eel Trapping, June 2020

Robert E. Schmidt and Lea Stickle

Introduction

The Annandale Dam is located on the Saw Kill in Annandale, Dutchess County, New York. A hydropower generating facility has been proposed at this dam. As part of assessing environmental concerns about the proposed facility, we sampled American eels (*Anguilla rostrata*) in the vicinity of the dam. American eels are the only migratory fish in the Annandale area of the Saw Kill, are considered a significant species in the Hudson River watershed, and are suffering a population decline on the East Coast. This report summarizes our effort to collect American eels from the plunge pool under the Annandale Dam.

Methods

Two fish traps were deployed in the plunge pool under the Annandale Dam. The traps were 1 m long with two funnels and were baited with cans of cat food with holes punctured in the cans. These are the same traps used in a previous study of the Annandale Dam plunge pool (Anderson and Schmidt 2006). The traps were deployed on June 10, 2020 and were checked and rebaited every two or three days until June 19, 2020 when sampling ceased.

Captured eels were anesthetized with clove oil, measured (total length in cm), tip of the right pectoral fin was clipped, and the animals were returned to the plunge pool. Other organisms captured were identified, counted, and released.

Results

Traps were fished for 9 days (18 trap-days). Three American eels were captured and one of them was recaptured for a total catch per unit effort of 0.22 eels per trap-day. The eels were large (58, 74, and 90 cm TL) and the recaptured eel was the smallest of the three. In contrast, Anderson and Schmidt (2006) caught 10 American eels and had 7 recaptures in 38 trap-days for a catch per unit effort of 0.45 eels per trap-day with a population estimate of 13 eels. Sizes were smaller in that study, 42-79 cm TL.

Other species collected (Table 1) were rock bass (*Ambloplites rupestris*), cutlip minnow (*Exoglossum maxillingua*), white sucker (*Catostomus commersonii*), pumpkinseed (*Lepomis gibbosus*), and spinycheek crayfish (*Orconectes limosus*). All of these species are native to the Hudson River except the rock bass.

Table 1. Summary of the fishes collected under the Annandale Dam using baited traps.

Survey Dates	6/10/2020		6/12/2020		6/15/2020		6/17/2020		6/19/2020	
	West Trap	East Trap	West Trap	East Trap	West Trap	East Trap	West Trap	East Trap	West Trap	East Trap
American eel	1				2*		1			
rock bass	4		7		1	2		1		2
cutlip minnow				3		3				
white sucker						1				
pumpkinseed						1			1	
spinycheek crayfish				2						

*one of these eels was a recapture

Discussion

American eels inhabiting the plunge pool under the Annandale Dam are large, in fact the 90 cm TL individual may be the largest accurately measured in the Hudson Watershed. These large eels are females and, once they return to the Sargasso Sea to spawn, contribute to the glass eel populations in future years. Anderson and Schmidt (2006) estimated only 13 American eels living in the plunge pool. The catch per unit effort in 2020 was half the value in 2006 but traps were fished for twice as long in 2006. We conclude that both studies showed that few eels (< 20) inhabit the plunge pool, but they are large and that there was little difference seen between these two studies.

Even though the numbers are small, these large female eels are important. Great care should be taken during construction, maintenance, and running the power facility to minimize disturbance of the plunge pool habitat.

Louisiana Waterthrush

The Louisiana waterthrush is a warbler that is listed as a Species of Greatest Conservation Need in New York. This bird breeds along streams and in swamps, and is reported to typically build its nest beneath a tree root or a log, or in a soil cavity, on an eroding bank. Almost every spring since the 1970s, a Louisiana waterthrush has been heard singing regularly in the vicinity of the lowest waterfall on the Saw Kill (i.e., between the Lower Dam and the tidewater of South Bay).

During the 2016 bird surveys for this project, Kiviat found Louisiana waterthrushes singing in the traditional location, as well as foraging just above the Lower Dam, and at a location between the Annandale Pond and Route 9G. On one day in early June 2020, Chris Graham surveyed the Saw Kill on from the tidal mouth upstream to the Annandale residential cluster, and Susan Rogers surveyed on the morning of 26 June by boat from River Road to Route 9G. Graham found a singing male Louisiana waterthrush in the typical location between the Lower Dam and the tidal mouth. Rogers did not find the

species upstream. The downstream waterthrush is unlikely to be affected by micro-hydropower at the Annandale Dam, whereas an earlier considered hydropower development at the Lower Dam could have disturbed the singing male (and presumably a female) whose breeding territory includes that dam and probably the banks down to the tidal mouth.

Wood Turtle

The wood turtle is a Species of Greatest Conservation Need that is closely associated with streams and rivers. There is a historic record of wood turtle near the Saw Kill at Bard, and recent (2018) documentation of a population in the Saw Kill upstream of Route 9G. A wading survey for wood turtle in the lower Saw Kill at Bard is scheduled for September 2020 when flows are likely to be low and the turtles in the water rather than on land. The survey will be performed by Hudsonia collaborator Jason Tesauro.

Flora

In 2016, for this project, Gretchen Stevens surveyed the vascular flora of the entire lower Saw Kill from the tidal mouth upstream to Route 9G, and including the old penstock ditch from the Lower Dam to the location of the historic Montgomery Place hydroelectric generating plant. At that time, there was consideration of a micro-hydropower turbine installation at the historic site, an option that is not now considered viable. The flora was surveyed in two, 1 meter belts from the low water level up the banks. A flora list was appended to our original report (Kiviat et al. 2017). Bryophytes were also surveyed, by Julia Palmer, in several sample plots along the Saw Kill, 2016-2017. Findings in 2016 included documentation of two large populations of the winged monkeyflower (*Mimulus alatus*; New York State S3 Rare), one of which was previously unknown and the other last studied in 1992. Palmer also discovered the rare two-ranked moss (*Pseudotaxiphyllum distichaceum*; New York State S2S3).

Stevens began to re-survey the winged monkeyflower populations on 2 July 2020 and found that seasonal development was late and the plants were short and not flowering yet (much of the seasonal development of plants and animals has been late this spring and early summer). She decided to postpone the survey until later in summer when the monkeyflower will be easier to see among its associates and can be censused more accurately. The rest of the flora, including the moss, will also be surveyed later in summer, by Stevens, when more species are detectable and identifiable.

Saw Kill Water Quality Monitoring Update - July 2020

By Emily White

Planned water quality monitoring has been delayed due to shutdowns associated with the COVID-19 pandemic. A YSI EXO2 multiparameter sonde was redeployed in the impoundment above Annandale Dam (42°0'40.98" N, 73°54'31.038" W) on June 8th, after being retrieved at the end of the field season last November. This sonde collects data (temperature, conductivity, water depth, turbidity, dissolved oxygen, pH, total algae) every 15 minutes at a depth of approximately 1 m. The sonde will continue to be maintained at this location for at least one year post-installation and into the foreseeable future for long-term monitoring of the impoundment by the Bard Water Lab. Data loggers will be installed below the

dam to continuously monitor temperature, turbidity, conductivity, and dissolved oxygen at a single location to capture water quality downstream of the tailrace. Additional temperature loggers will be used to explore potential temperature variations associated with the microhydro installation. These instruments will be deployed (as soon as is feasible) for the 2020 season as well as the 2021 season (to assess pre and post installation conditions, respectively). An additional sonde is currently deployed much farther downstream (data are available for this site, just above the lower dam since 1995; 42°01'01.8"N 73°54'53.8"W), which will provide data for comparison. Pending the reopening of labs, which is expected this month, grab samples will be collected and analyzed to evaluate the spatial variability of water quality in the vicinity of the study site prior to the installation of the microhydro system.

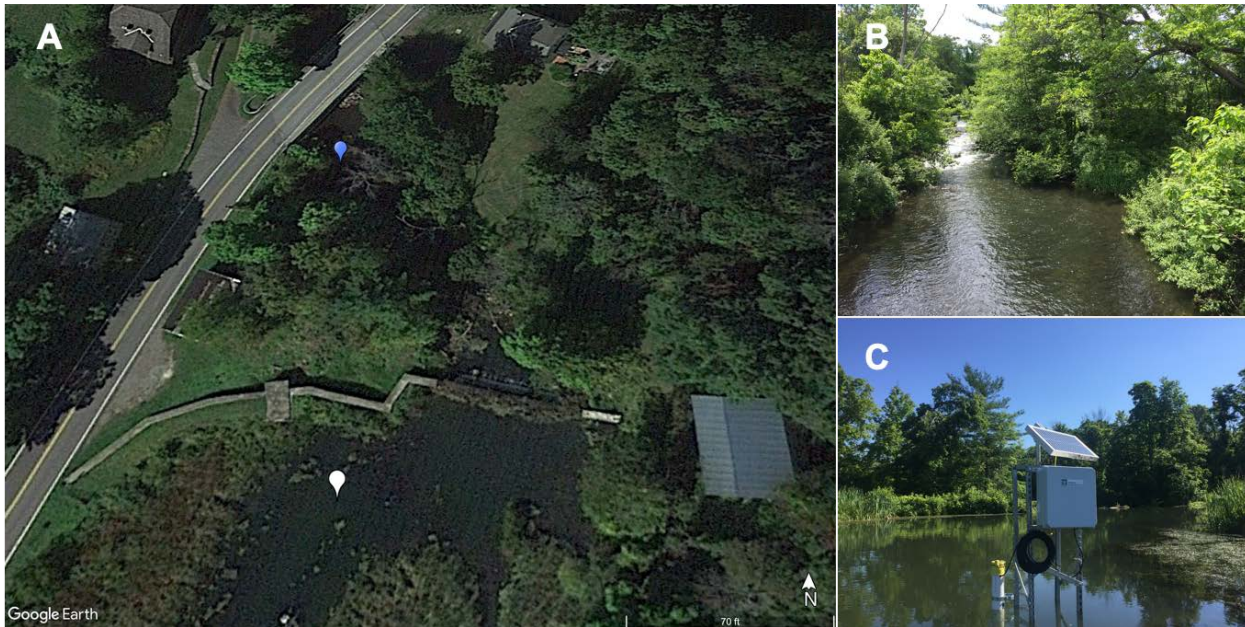


Figure 1. (A) Google Earth image showing the location of sampling equipment in the project A. The blue marker is the approximate location of data loggers downstream of the dam and the microhydro installation. The white marker is the location of the water quality sonde in the impoundment above Annandale Dam. (B) Photo showing the general area where data loggers will be deployed below the dam. The view is from the River Road bridge facing southeast. (C) Photo showing the water quality sonde deployed in the impoundment. The view is facing northeast. Both photos were taken in June 2019.

References Cited

- Anderson, J. and R.E. Schmidt. 2006. Significance of small impoundments to American eel (*Anguilla rostrata*). Section III: 20 pp. In W.C. Nieder and J.R. Waldman (Eds.), Final Reports of the Tibor T. Polgar Fellowship Program, 2005. Hudson River Foundation, New York, New York.
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