

Susquehanna River (SR) Survey #s 419024, 25, 35, 38 Scott Wells, Region 4 Fisheries

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The upper east branch of the Susquehanna River (SR) is located in DEC's Region 4 draining most of Otsego Co. and western Delaware Co., NY (see survey map). Historical runs of juvenile American eel, hereafter A. eel, were cut off from entering the watershed by several major dams in the far lower river almost one hundred years ago. A. eel were considered a key component of the fish communities in the basin prior to damming (Dittman et al. 2009). Since 2005, A. eel have been trucked up past the largest dams and released at various locations in PA (Henning and Shank 2018). In 2019, A. eel were also released at two locations in the NY portion of the basin as part of a rusty crayfish/FW mussel study by SUNY Oneonta (Lord and Coney 2019). The purpose of these surveys was to assess the fish communities below lowhead dams in Region 4 where A. eel would most likely be found.

Backpack or barge electrofishing were the primary gears used at all six sampling sites which included three main stem SR locations below the Southside Dam in Oneonta, Colliersville Dam below Goodyear Lake, and Cooperstown Dam; plus three adjacent tributaries in the The Fly below Buck Horn Lake Dam, Ouleout Creek below East Sidney Dam, and the upper Unadilla River below the lowhead dam in Unadilla Forks (see survey map). Additionally, eel pots or cages baited with pet food were deployed at one site. No eel mops were used since flashy flows and long travel times to/from the basin prohibit effective monitoring. All fish collected are generally processed on site, with A. eel held captive long enough to receive a PIT—passive integrated transponder tag, commonly used to track fish movement, before being released above their next barrier to their upstream migration.

Between July 30 and October 17, 2019 staff from R4 Fisheries in conjunction with SUNY Oneonta, Hartwick College, and HDR made six day trips to sampling sites in the basin (see survey map). Surface water temperatures and conductivity ranged from ~54 to 82 °F and 80 to 570 (avg. ~69 °F / 254), respectively. Single or tandem backpack shocking proved to be most efficient. Total on-time was 3.0 h with a mean of 0.38 h/site and three of four eel pots were abandoned in Ouleout Creek due to high flows in October. Overall, 33 species, 594 fish were recorded in four separate surveys (one per tributary) with bluegill most numerous, comprising nearly 20% of the total catch, followed by cutlips minnow, horneyhead and river chub, respectively. Juvenile A. eel were found at three of the six sites in low density (five captured, four observed) below all three tailwaters on the main stem SR (Table 1). Total length and weight for A. eel captured ranged from 212-420mm and 10-92g (avg. 311mm/42g), respectively. Interestingly, an older/larger (silver?) A. eel was shocked up but missed below the Southside Dam, likely from a very early stocking in PA waters. Despite low density, catch rates for A. eel were 1.7/h, similar to northern hog sucker in the main stem SR and >10 other stream fishes found in the surveys (Table 1). Unfortunately, only two A. eel were PIT tagged as one escaped a holding pen and tag injections into the two small juveniles were problematic. All A. eel captured were released into Otsego Lake, where they likely have been absent since the mid-1900's. Native crayfish were collected in the lone eel pot from Ouleout Creek.

Comparing fish communities between waters sampled (see survey map) reveal slight differences in species composition. Again bluegill, cutlips minnow, and horneyhead chub dominated the catch at all three main stem SR sites but absent were ten species only found in the tributaries (Table 1). The Fly had the lowest richness of the tributary sites with only 6 species, 74 fish dominated by Centrarchids that likely had washed out of the Buck Horn Lake. The upper Unadilla River had 13 species, 50 fish total dominated by common shiner with a catch rate > 33/h followed by rock bass, pumpkinseed, tessellated darter, and burbot all having catch rates > 20/h. Ouleout Creek had 16 species, 97 fish dominated by river chub and brown trout with catch rates just over 173 and 34 fish/h, respectively. As trap and transfer of A. eel continues in the SR basin, we expect their range, densities, and sizes to increase over time.

Citations

Henning, A. and M. Shank. 2018. Reintroductions and current dispersal of American eel (*Anguilla rostrata*) in the Susquehanna River basin. *Poster presented at the annual AFS conf.*, American eel symposium. Atlantic City, NJ.

Dittman, D.E., Machut, L.S., and J.H. Johnson. 2009. American Eels: Data Assimilation and Management Options for Inland Waters. Final Rep., Contr. #C005548, SWG T-3, Proj. 3. NYSDEC Bureau of Fisheries, Albany, NY. 96 pp.

Lord, P. and S. Coney. 2019. Reintroduction of American eel to the NY portion of the Susquehanna River: Activities and Results 2018. State Univ. of NY at Oneonta. 9 pp.



Table 1. Fish community survey results in the upper Susquehanna River basin from July 30 - October 17, 2019.

Common Name	¹ C	² O	Total	Abundance	³ CPUE	SR	UR	OC	TF
American eel	5	4	9	1.5%	1.5	X			
Brown trout	9		9	1.5%	3.0			X	
Central stoneroller	7		7	1.2%	2.3	X			
Cutlips minnow	55		55	9.3%	18.3	X	X	X	
Horneyhead chub	46		46	7.7%	15.3	X			
River chub	45		45	7.6%	15.0			X	
Golden shiner	3		3	0.5%	1.0				X
Common shiner	17		17	2.9%	5.7	X	X	X	
Spottail shiner	13		13	2.2%	4.3	X	X	X	
Rosyface shiner	23		23	3.9%	7.7	X	X	X	
Spotfin shiner	1		1	0.2%	0.3		X		
Bluntnose minnow	4		4	0.7%	1.3			X	
Blacknose dace	1		1	0.2%	0.3				X
Longnose dace	27		27	4.5%	9.0	X		X	
Creek chub	1		1	0.2%	0.3			X	
Fallfish	4		4	0.7%	1.3	X		X	
White sucker	4		4	0.7%	1.3			X	
Northern hog sucker	5		5	0.8%	1.7	X	X		
Margined madtom	10		10	1.7%	3.3	X		X	
Burbot	5		5	0.8%	1.7		X		
Rock bass	25		25	4.2%	8.3	X	X	X	
Redbreast sunfish	2		2	0.3%	0.7	X			
Pumpkinseed	34		34	5.7%	11.3	X	X	X	X
Bluegill	117		117	19.7%	39.0	X			X
Smallmouth bass	30	6	36	6.1%	10.0	X	X		
Largemouth bass	7		7	1.2%	2.3				X
Black crappie	2		2	0.3%	0.7	X			
Greenside darter	12		12	2.0%	4.0	X	X	X	
Tessellated darter	14		14	4.4%	4.7	X	X		
Yellow perch	4		4	0.7%	1.3	X			X
Shield darter	21		21	3.5%	7.0	X	X		
Walleye	0	4	4	0.7%	0.0	X			
Slimy sculpin	27		27	4.5%	9.0	X		X	
Totals	580	14	594						

¹C—catch and ²O—observed data combined = Total recorded data. ³CPUE—catch per unit effort in (3.0) hours of shock time. Abbr. for waters = SR—Susquehanna River, UR—Unadilla River, OL—Ouleout Creek, TF—The Fly