To: Al Fichtel
From: Ed Machowski, Fisheries Biologist, CT DEEP Fisheries Division
Re: Fall 2018 sampling at Amston Lake
Date: March 13, 2018

This report provides a summary of our findings during our night boat electrofishing carried out at Amston Lake during the fall 2018.

Sampling Background

- The Fisheries Division (FD) samples lake fish populations at night using a boat electrofisher, following standardized sampling protocols. The electrofishing boat operates at slow speed along nearshore areas of the lake while a DC current is pulsed into the water. Stunned fish are netted, counted and measured, then released back into the lake.

- Relative abundances of each species are expressed as catch-per-hour (CPH) of electrofishing time (including only time during which the electrofisher is "on" and generating current). CPH provides a standardized index of abundance that facilitates comparison of species abundance among lakes or over time within a lake.

- For most fish species, the FD calculates CPH for two size-classes: fish that are "stock size" or larger (stock size is defined as the smallest size commonly caught by anglers in public lakes), and fish that are "quality size" or larger (quality size is defined as the smallest size which most anglers consider desirable to catch). CPH for stock and quality size for the fish species pertinent to Amston Lake are shown in Table 1.

- For comparison, Table 1 also lists state averages for CPH by species calculated from 69 Connecticut public lakes sampled during 2005-2011 for both stock and quality size fish.

- Fish species are sorted into three categories that roughly correspond to their trophic level (i.e. their position within the "food chain"):

    - "Top-Level": predatory fish that reach large sizes and prey primarily on other

fish.

- "Mid-Level": fish species that reach intermediate sizes and may consume fish prey.
- "Low-Level": smaller fish species that prey primarily on invertebrates.

Lake Background

- Amston Lake has been sampled a total of seven times since 1994, six of which were all considered representative samples (1994 sample was poor due to equipment malfunctions).
- A voluntary minimum length limit on bass was implemented in 1995 for Amston Lake. A total of six samples have been completed since enacting the length limit. Data from these samples will determine effects of this regulation on the Lake's bass population and will also help track changes of Amston's other fish species.
- 300 Largemouth Bass (5"-8") were stocked into Amston Lake in 1998. And, 1,000 Channel Catfish (~4") were stocked in 2014.

2018 Findings

- The FD crew along with a member of the Amston Lake Association (Al Fichtel – on the sample to tag bass) sampled Amston Lake on the night of October 04, 2018 using our boat electrofishing unit. Weather conditions and water clarity were both favorable and the overall sample was considered to be excellent and comparable to past samples.
- The species composition in Amston Lake was consistent with past samples and is typical of most Connecticut lakes, in that the lake contains a diversity of warm water fish species. Of note:
    - Electrofishing CPH for both stock-size and quality-size bass was a little better than the 2016 sample, but both still fall below the statewide average, and are well below the CPH for bass from Amston Lake prior to 2016.
    - Chain Pickerel were down from past samples, but CPH was still above the statewide average for both stock and quality size fish.

- In general, all stock-size fish species sampled in Amston Lake, when compared against the applicable statewide average for public lakes, are considered "Below" average, except for Chain Pickerel, Sunfish (Bluegill and Pumkinseed) and Brown Bullhead, which were considered "Above" average (Table 1).

- Similarly, all quality-size fish species sampled when compared against the applicable statewide average for public lakes, are considered "Below" average, except for Brown Bullhead, which were "Average" (Table 1).

- The diversity and abundance (CPH) of "Top-Level" predatory fish species sampled at Amston Lake is low (Table 1).

    - The only "Top-Level" fish species (i.e. Gamefish) sampled were Largemouth Bass and Chain Pickerel.

- Sunfish (Bluegills and Pumpkinseed) dominated the "Mid-Level" fish species category for this lake during the sample.

- Other "Low-Level" species (Shiners, Carp, Darters, etc) have been sampled sporadically over the years, and there was no detectable change with the fish in this category in 2018.

- No Channel Catfish were sampled in 2018.

Growth

- Scale samples were taken from most fish species in 2018. All bass scales were processed and aged. These ages were compared to those from previous samples and showed no detectable difference in growth for Largemouth Bass. Overall, growth of bass is still good, but slightly below the statewide average.

Summary

Based on our sampling since 1994, it would appear that the fish community in Amston Lake remains in flux. The initial thought that the Largemouth Bass population responded favorably to the 16 inch length limit imposed in 1995 was somewhat confounded with the stocking of 300 Largemouth Bass in 1998. But, regardless of which had more impact on the

Lake's bass population, there was definitely an increase in abundance of both stock and quality size bass from 1996 through 2013.

During this same time period there has also been an annual increase in Chain Pickerel, including Pickerel over 15 inches. This is unusual because in many public lakes statewide, Chain Pickerel have been in decline.

Of concern presently, is the decrease in abundance of stock and quality size bass beginning in 2016. One possible explanation for this is the bass stocked in 1998 would be reaching the end of their life cycle and are now dying off and leaving the system. But, that would only account for a drop in the larger size (i.e. quality size) fish because the fish stocked in 1998 would all now be sizeable fish. However, both larger and smaller size bass have declined.

One interesting facet to the Amston Lake fish community is the predator/prey relationship. Typically, when predator abundance increases, the prey species usually decline. And conversely, as predator species decline, the prey species populations increase in abundance. This relationship has not held true in Amston Lake. In fact, the most recent and pronounced decline in bass has been followed by a similar (but not as pronounced) decline in sunfish.

Based on the given data, it would appear that there are other "other factors" such as drawdowns, weed treatments and other anthropogenic habitat alterations which may be resulting in a decline of certain fish species within the lake.

Recommendations

- Allow the DEEP FD to sample the lake via night electrofishing in both spring and fall of 2019. A combination of both spring and fall samples will greatly help determine if the recent decline in bass and sunfish is real.

- Consider evaluating/monitoring any and all current activities in and around the lake to determine potential impacts to the lakes fish community and overall lake ecosystem.

Table 1. Catch rates (fish per hour - CPH) for fish species in two size classes, above stock[1] size and above quality size[2] (in parentheses), captured by electrofishing in Amston Lake 2008 - 2018. State averages for selected fish species are included for comparison. (DEEP Fisheries data)

	Date(s)	10/15/08	10/23/13	10/05/16	10/4/018	State Ave. Public Lakes 2005-2011
	Effort (hours)	**1.01**	**1.02**	**1.02**	**1.01**	
SPECIES	Stock(Quality)					
	size in inches					
GAMEFISH						
Largemouth bass	8(12)	57.6(17.9)	75.8(47.2)	33.5(13.8)	36.8(26.8)	**57.9(29.4)**
Chain pickerel	10(15)	38.8(5.0)	78.7(20.7)	90.5(43.3)	50.7(14.9)	**20.6(6.3)**
LARGER PANFISH						
Black crappie	5(8)	13.9(9.9)	45.3(43.3)	22.6(22.6)	12.9(12.9)	**21.3(17.1)**
White perch	5(8)	7.0(7.0)	12.8(12.8)	11.8(11.8)	1.0(1.0)	**127.6(48.9)**
Yellow perch	5(8)	87.4(78.5)	68.9(65.9)	58.0(46.2)	32.8(23.8)	**102.1(48.2)**
Brown bullhead	6(9)	4.0(4.0)	6.9(6.9)	18.7(14.8)	44.7(14.9)	**11.7(10.6)**
SUNFISH						
Bluegill	3(6)	430.3(249.0)	741.4(475.8)	909.8(199.1)	549.4(67.4)	**343.3(142.3)**
Pumpkinseed	3(6)	65.7(45.8)	85.2(59.5)	160.1(103.5)	73.4(19.8)	**59.3(23.5)**
Rock Bass	3(6)	-	4.0(4.0)	6.9(6.9)	1.0(1.0)	**38.9(24.4)**
NON-GAME SPECIES						
Bridle Shiner		1.0	-	-	1.0	-
Tessellated Darter		-	-	1.0	-	-
Common Carp		-	-	1.0	-	-
Golden Shiner		1.0	-	7.9	-	**20.9**
Banded Killifish		-	1.0	-	-	-
American Eel		22.9	24.6	18.7	15.9	**24.3**

[1] "Stock size" is a length above which the fish typically becomes vulnerable to angling.

[2] "Quality size" is a length above which most anglers would consider the fish desirable to catch.