Factors Affecting Fishing Quality at the Branford Supply Ponds

NRCA Student: Carter Shannon[1]

Community Partner: Suzanne Sullivan[2]

[1] Branford High School; [2]Branford Public Schools

INTRODUCTION

The focus of our project was the Branford Supply Ponds located in my hometown of Branford (near the coast of CT). In the late 19th century, the 26-acre Supply Ponds--man made ponds--were created by damning Pisgah Brook that flows to the Branford River and Long Island Sound. The original purpose of the ponds was a public water supply, as well as a body of water in which ice was produced. Now no longer a water source, since 1969 the Supply Ponds has been one of Branford's largest public recreation spaces.

A popular spot among local fisherman, the Supply Ponds were where I developed my interest in fishing and honed my skills. Although characterized by out of control invasive weed growth and an elusive Koi fish lurking in its depths, the Supply Ponds offers good fishing opportunities for anglers throughout the year.

In previous years, I have caught many different species from the bridge location at Supply Pond (Figs. 1 & 3). That is until recently, when now a 1-2 hour trip to the pond often results in you coming out empty handed. I've noticed a steady decline of panfish present at many of the fishing spots (Fig. 3). The steady downgrade in fishing success as well as an apparent influx in vegetation growth, prompted this project.

OUR GOAL

To understand our perception of a lack of visible and catchable fish, we sought to:

1. Analyze the Supply Pond's water quality (conductivity and total dissolved solids) to determine its impact by possible pollutants;
2. Fish the pond to obtain available species data; and
3. Set up an electronic survey for other anglers to document their fish catches by location.

It is our hope that this combination of efforts will help elucidate possible causes for the downgrade in fishing at the Branford Supply Ponds.

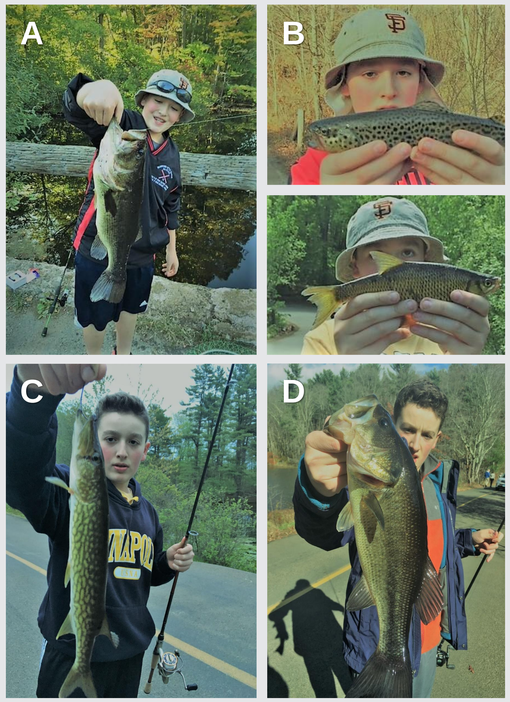

Fig 1. Shows the diversity of fish at Supply Ponds in Branford, CT, all caught at the Bridge Location (Fig 3). A: large mouth bass (LMB), Oct. 2015; B: (top) rainbow trout, Apr. 2016, (bottom) roach, May 2016; C: chain pickerel, May 2017. D: LMB, Nov. 2018.

ACKNOWLEDGEMENTS

This project wouldn't have been made possible without the time and effort devoted by Jeff Shannon, Suzanne Sullivan, and the whole NRCA crew for helping with the initial field experience portion of the program. With their help this project took shape. Thanks again for all those who helped out and made this possible.

MATERIALS AND METHODS

Water Quality Testing

Using an Ubante TDS meter (model YL-TDS2-A), we sampled water at five sites (Fig. 3) in the Supply Ponds in Branford, CT, three times between October 8th and November 4th, 2018 (Fig. 2).

- Total dissolved solids, conductivity, and temperature were measured in triplicate and averaged.
- Conductivity temperature correction was calculated by using a conversion factor to correct samples to conductivity at 25 °C.[1,2]

Fig 2. Carter taking water sampling measurements at: A: Site 5; B: Site 1; C: Site 3. See Fig. 3 for site legend.

Angling Survey

- A Google Form Angling Survey was created to learn what locations are fished and the species of fish caught by other anglers at the pond.
- Signs with a QR code for the survey were placed in 6 highly visible locations around the pond.
- Between August 15th and December 23rd, 2018, we obtained 8 responses: 6 from our own trips and 2 from an independent angler. The results provided in this report are based on these responses.
- Since independent angler participation was low, data collection is ongoing and will be analyzed again in the future.

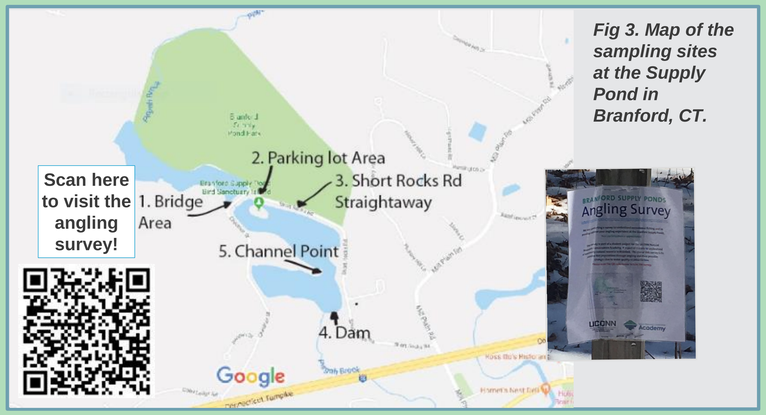

Fig 3. Map of the sampling sites at the Supply Pond in Branford, CT.

RESULTS

Water Quality

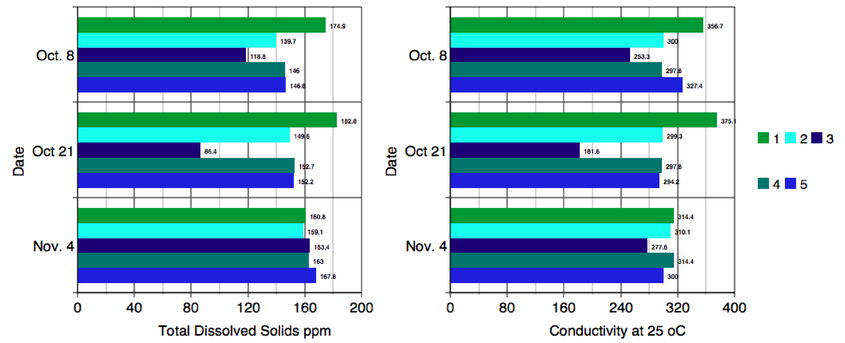

Fig 4. Total dissolved solids and specific conductivity at five sites in the pond during the three survey periods. (Left) Total dissolved solids ranged from 86.4 to 182.8 ppm well within the normal range for healthy fish. (Right) Conductivity ranges from 181.6 to 375.1 µS/cm which is in the range of normal from 150 to 500 µS/cm is normal freshwater range to support diverse species.

Angling Survey

- Preliminary results show that few fisherman frequent the Supply Ponds in the late fall/winter months.
- Anglers noted an abundance of weeds deep into December.
- Fishermen caught few fish and reported low scores for angling satisfaction (Table 1).

Survey Parameter	Average	Range
Angler Satisfaction 1-10 (worst to best)	3	1-6
Fish Caught per Hour of Angling	0.93	0-1.5

Table 1. Angler satisfaction and number of fish caught per hour recorded in our online survey.

CONCLUSIONS

- We established baseline values for conductivity and total dissolved solids in different parts of the pond. The samples gathered were all within normal limits (Fig. 4), and since the majority of these samples were obtained before road salts were applied, this finding is not surprising.
- Other factors such as sediment deposits, eutrophication, and invasive plants (i.e. Milfoil and Duckweed[4]) threaten fish, deplete fish habitat, and harm angling success. Non native plants, like Eurasian Milfoil and Duckweed are just a few that are present.[3] Invasive species can exacerbate eutrophication, where abundant nutrients in a water body cause an increase in vegetation. Further water quality sampling and research should be done at the Supply Ponds to fully understand these effects.
- A recent study has shown a link between salinization and alkalization, so pH and conductivity should be monitored over time to see if they are impacting the supply ponds.[4]

An angler contributing to our fish survey conducted as part of the project voiced his displeasure with the condition of the pond…

"The pond weeds are terrible the pond is only nice during late fall to spring from May to Sept the pond weeds choke off the entire pond. Seems like there most be a way to rid the pond of these weeds besides dredging"

REFERENCES

1. https://www.saiglobal.com/PDFTemp/Previews/OSH/ISO/990624_1537/T014838E.PDF
2. Testing the Waters: Chemical and Physical Vital Signs of a River, Behar S.. Montpelier, VT: River Watch Network, 1997
3. https://portal.ct.gov/-/media/CAES/Invasive-Aquatic-Plant-Program/Survey-Results/Branford-Supply-Pond/branfordsupplypondspdf.pdf?la=en
4. Kaushal S.,Likens G., Pace M., Utz R, Haq S., Gorman J., & Grese M., PNAS January 23, 2018 115 (4) E574-E583