Population Assessment of the New York State Threatened *Enneacanthus obesus* (Banded Sunfish) Conducted in Zeke's Pond and the Peconic River.

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Abstract

Enneacanthus obesus (Banded sunfish), the smallest species of sunfish inhabiting rivers, lakes, and ponds along the Atlantic coast, has been declared a threatened species in the state of New York. Approximately 200 sunfish were relocated to Zeke's Pond in 2004 during the remediation of the Peconic River, which runs through Brookhaven's property. However, in 2005 a drought nearly eliminated the relocated sunfish population. A population assessment was conducted in the Peconic River, and Zeke's pond, which is found on the eastern most point of Brookhaven's grounds. To capture and assess a sampling of the sunfish population, a seine net, a dip net, a bucket, a measuring tape, a pen, and an all weather writing tablet were utilized. The first step was to complete a survey of the aquatic vegetation by calculating the amount of vegetation in the immediate area that was to be seined. The sunfish were collected from the seine net, stored in the bucket, counted, measured, and then returned safely back to the water. No sunfish were found in the Peconic River. An area of approximately 25785.5 ft.^{2} was covered in Zeke's Pond during a series of thirteen visits resulting in a total of eighty seines. Final fish counts yielded 369 sunfish, sixty-six catfish, and thirteen pumpkinseeds. The estimated total population is 4,027, which is 4% of the previous study's count of 95,900. Further studies are necessary to document the life cycle and population trends of the *Enneacanthus obesus*.

Fig. 1 Zeke's Pond

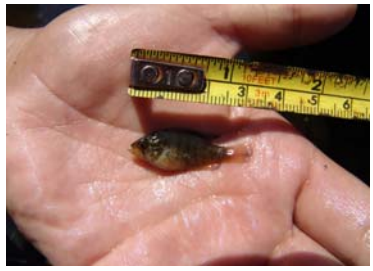

Fig.3 Juvenile Banded sunfish

Fig.2 Adult Banded sunfish

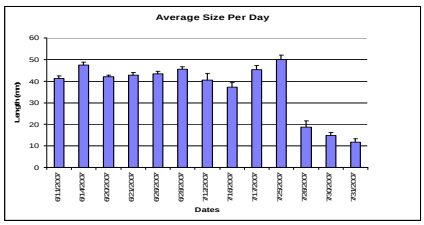

Table 1 Average Sizes of Fish Per Day

Materials and Methods

To capture and assess a sampling of the sunfish population, the materials required included a seine net, a dip net, a bucket, a measuring tape, a pencil, and an all weather writing booklet. Once in the water the preliminary procedure consisted of completing an Aquatic Vegetation Survey (AVS) by calculating the amount of Submerged Aquatic Vegetation (SAV) in the area that was to be seined. The aquatic vegetation survey was conducted by visually observing the quantities and densities of vegetation present in the area to be seined. Upon observation a rubric was utilized to calculate the amount of vegetation present in each seining site.

Once the AVS was completed for each approximate area of 8' X 20', seining was done in the assessed area. To seine an area, the seine net had to be dragged along the floor of the pond and pulled rapidly from the water; the sunfish were collected from the seine net by sifting through the SAV that was captured in the net. Next, the fish were counted and stored in the bucket until the seine net was completely emptied. Then the fish were measured individually, and their size was recorded for future reference. Finally the fish were returned safely back to the water. Once the assessment of the fish was completed, the next seining process would begin where the last process ended immediately following the AVS.

Results

An area of approximately 25785.5 ft.^{2} was covered in Zeke's Pond during a series of thirteen visits resulting in a total of eighty seines. Final fish counts yielded 369 sunfish, sixty-six catfish, and thirteen pumpkinseeds

Fig.4 Peconic River

Introduction

Enneacanthus obesus is a fresh water fish of the order Perciformes and the family Centrarchidae; their common name is banded sunfish. The word Ennea, meaning nine, and canthus, meaning rim of wheel or edge, represents the 9 "bands" circling the little fish's body.

Averaging about 40 to 70mm in length ,other distinguishing characteristics of the banded sunfish include an upturned mouth, rounded pectoral and tail fins, and an olive green body covered with purple, green and gold iridescent specks. *E. obesus* are carnivorous fish; they eat crustaceans, mollusks, other small aquatic or living life forms, and insect larvae.However, the most ecologically significant part of their diet is mosquito larvae, which helps control the mosquito population.The banded sunfish inhabit rivers, lakes, and ponds along the Atlantic Coast; however, *E. obesus* is a threatened species in the state of New York.As a threatened genus, it has become important to reestablish the banded sunfish and prevent them from moving to the endangered species list. Therefore, Brookhaven National Laboratory in conjunction with the Department of Energy launched plans to prevent the sunfish from becoming endangered.The Peconic River, which runs through the grounds of Brookhaven National Laboratory, was home for the sunfish however, in 2004, lab personnel began remediation on the river to remove harmful chemicals that had spilled into the river over the past decades of scientific research and discovery. During the initial steps of the remediation process, scientists and students at the lab began removing banded sunfish and relocating them into other parts of the Peconic River and Zeke's Pond, which is on the eastern most point of the laboratory's grounds.As a result of those initial steps in the remediation process, Zeke's Pond received approximately 200 banded sunfish. In 2005 a drought nearly eliminated the relocated sunfish population.Six sunfish were rescued from the practically waterless pond.Once the pond water had returned to adequate levels, the surviving sunfish were re-released into the pond to flourish .

Discussion/Conclusion

The estimated total population is 4,027, which is 4% of the previous study's count of 95,900. The sizes of the fish also contrasted between initial and final runs. In runs one through sixty-seven the sizes of the fish caught ranged from 17mm to 60mm. However, in runs 68 through 80 the sizes of the fish caught ranged from 12mm to 57mm. Most of the fish caught in the final runs were very small in length in comparison to the fish caught initially as a result of the fish spawning during the week of July 1, 2007. Schools of fry could be observed during that time. Due to this fact, seining had to be suspended for a week to allow the fry to grow. Further studies are necessary to document the life cycle and population trends of the *Enneacanthus obesus*.

Acknowledgements

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