

✓ 11/2009

11/2009

Fishery Resource Grant Program Final Report 2009

Project title: Characterization of Bycatch and Regulatory Discards in Virginia's Spring Striped Bass Gill Net Fisheries and Analysis of Gear Alterations on CPUE and bycatch Composition.

Name of PI: George Earl Trice

Telephone: (757) 868-4058 Email: thetrice4@verizon.net

Address: 147 Church Street

Poquoson, VA 23662

Give a brief summary of the project.

The striped bass fishery is of great economic importance to Virginia's commercial finfishermen and anchored gill nets are the predominant gear used in both coastal and estuarine waters. Unfortunately, these nets have the highest rate of Atlantic Sturgeon bycatch (85%) compared to other Virginia gear types (NMFS) and the second largest bycatch recorded by NMFS Northeast Observer Network coastally. High Atlantic sturgeon interaction rates could result in seriously restrictive regulations being imposed on the fishery or even complete closure, once Atlantic sturgeon are listed under the Endangered Species Act as has been proposed. Recognizing this important threat to the fishery, Virginia commercial fishermen have proposed continued proactive collection of sturgeon bycatch and research into means of reducing these gear interactions. This work is also integral to collection of biological data necessary to laying the foundation for restoration and improved protection of the species. Our breadth of knowledge on gillnet bycatch has led us to the point where we are actually testing and engineering solutions based on gear alterations.

What work did you intend to do, and how did you plan to accomplish it?

We intended to conduct a survey in the James River in Burwell Bay in March-- early June using control gear that duplicates efforts conducted by the FRG given to Mr. Place in 2005 and 2006 and myself in 2007 and 2008 and run experimental gear that varied from this control gear in hanging ratio and twine sizes. Meshes sizes that typify the striped bass fishery (5", 6", 7", 8") were to be run to test gear alteration effects on striped bass and survey mesh sizes of 10", 12", and 14" were also to be included. A total of 39 trips were proposed each to be conducted with 600 feet of 5, 6, 7, 8, 10, 12 and 14" stretched webbing. We also intended to examine how sturgeon were captured in the gear and where. We were also to record initial status (live/dead) of both sturgeon and striped bass and whether bass were kept for sale.

What was accomplished?

To accomplish our desired objectives as described in the 2009 proposal, we:

1) Observed and recorded catch in 11 fisheries dependent sets fished for striped bass in the spring, ~143 experimental net sets and 89 survey based sets using the 10, 12 and 14" gear. In addition, we deployed a 600' net consisting of 3 equal 100 foot sections of barium webbing and mono webbing. These sections contained an equal mesh size of 6" and contained meshes of equal twine size and hanging ratios. Barium webbing has a greater density than mono, one that allows cetaceans to pick it up with their sonar abilities more quickly and thus may reduce their entanglement rates. As opposed to last years study there was a noticeable difference in the catch rates of the mono and barium nets. The 2008 study showed just a 2 fish difference. In this study we found that the mono nets caught 145 striped bass and the barium only caught 116. Sturgeon catch rates were very similar in the two types of nets. The mono net caught 4 sturgeon and the barium net caught 3.

2) Net composition was recorded and species identified, counted, and total length measured. For striped bass and sturgeon status was recorded (live/dead) and for striped bass disposition fate (kept or discarded) was recorded. Sturgeon location in the gear top, middle, or bottom was also recorded. Time of day, gear location, relevant gear parameters, and physical conditions (weather, clarity) were also recorded so that gear performance could be compared.

3) All 67 sturgeon captured were measured and weighed and PIT tags and USFWS T bar Floy © applied if not present. All dead fish were given to VIMS for morphological research.

4) Twenty two sturgeon of appropriate size were turned over to VASRP in order to continue cooperative tracking studies investigating habitat use and location of the spawning grounds.

5) DNA was collected from 67 fish and will be delivered to geneticists in order to continue to refine stock structure.

6) Thus far, the only way we can quantify temporal populations is through the CPUE that we have collected since 2005. This suggests that the population is stable and may be growing but since DNA has not been examined due to cost it remains unclear how many of these fish are actually of James River origin. Tag returns have thus far been too few to make a mark recapture population assessment methodology applicable, given the highly migratory nature of the fish. However, data collected through our efforts has started to produce great promise of assistance from other funding sources such as NMFS and Army Corp of Engineers.

Thirty nine days of fishing were accomplished. Samples were collected from 3/23/08-6/12/09 in the Burwell Bay area.

All data was entered into preexisting access program in format used for 05-08 dataset and this was subsequently turned over to Chris Hager at VaSG for further analysis and incorporation into information formats to be delivered to management councils and committees

Of the 67 sturgeon collected, 6 suffered gear related mortality with a 8.9% mortality rate resulting. This mortality rate includes survey gear. Gear being fished so as to provide a uniform continuation of a survey that was started in an area of the James River where interaction rates are historically higher than the norm witnessed in the commercial fishery. This location was chosen in order to assure the survey had adequate catches for relative population analysis through a viable CPUE and to increase the chances of attaining sturgeon for tracking studies. These studies being conducted in collaboration with VCU, Va. Sea Grant, USFWS, James River Association and the Army Corp of Engineers (later referred to as the Virginia Sturgeon Restoration Partnership, VASRP) are being done to gain a better understanding of the temporal and spatial aspects of sturgeon habitat use. Habitat use data is extremely important to the fisheries because such data will provide the best available science upon which future regulations will be based if regulations involving time- area closures become necessary to reduce interaction rates.

In some cases gear not normally used in the striped bass fishery is being used (10-14") to provide mature fish for spawning ground identification work and these large fish which show up in the warmer water periods have a higher death rate due to the fact that they are predominately gilled in a manner that prevents respiration and leads to quick death. This large fish collection effort is essential to our fisheries' preservation because it not only defines where these large fish are most likely to be through tracking research but it also directly ties our industry to restoration efforts. Having learned from past studies we found that taking these nets up when water temps were higher drastically reduced our mortality rates. In 2008 mortality rates were 15% this year they were reduced to 8.9%.

Sample coverage of this study did not typify that of the striped bass fishery, since our sampling efforts extend beyond the normal striped bass season and some gear are atypical. However, by limiting analyzed samples to those with typical gear types and within a comparable temperature range and by simultaneously sampling fishery dependent gear reasonable estimates of gear performance in the fishery can be attained. Extension of sampling across a broad temperatures range is actually better when examining the effect of temperature on striped bass mortality. Though this data has only provided scientific evidence of what fishermen have known, that striped bass die much more rapidly in warm waters, this analysis must now be taken into account as best available science by management. If regulations are to prohibit the retention of large fish then gear regulations they should be tailored to maximizing the retention of fish of acceptable sizes.

In 2009 from March 23 to June 12, 147 striped bass less than 711mm were taken in 6" gear and 28 fish of over 711mm were taken or 19%. The 5.5" net caught 127 that were less than 711mm and 7 over 711mm or 5%. The 7" net caught 112 stripers and the 8" caught 66. There were much more larger fish caught in the bigger mesh nets this year than last year. This proves that the 6" nets do not catch a lot more over the legal size fish than the other nets as thought in last years final reports.

All fish less than 711 were retained for sale except for 9, which were rotten. These nine were taken in the warmest water sampled, therefore, this waste would likely not occur in the fishery unless fishing in this warmer water.

In 2009, we also attempted to collect enough data to examine differences in striped bass catch rates and survival due to gear alterations in hanging ratio and twine size. In order to do this all sections of each gear must be fished during periods of duplicate length and in the same area. Throwing out test that violated this parameter due to nets dragging or gear being cut, we collected 175 striped bass in 6", 112 in 7", 134 in 5.5" and 66 in 8" gear.

When comparing the catch rates of different hang ratios we found significant differences. Net sections that were hung on a 1:2 hang ratio caught more stripers. The heavier webbing hung on 1:2 caught 113 and the lighter webbing hung 1:2 caught 153. This is compared to net sections that were hung a 31:50 hang ratio. The heavier webbing hung on 31:50 caught 85 and the lighter webbing hung on 31:50 caught 102. However the hang ratios did not effect the sturgeon catch rates. Nets hung on a 1:2 hang ratio caught a total of 22 sturgeon were those hung on 31:50 hang ratio caught 19.

In short, experimental gear needs to be run more and earlier in the season when striped bass availability is high to get numbers that can lead to conclusive results. Running gear during this cold water period will also allow us to further examine the effects of temperature on striped bass mortality in anchored gill nets. Catches of sturgeon were too small and close in magnitude across variables in the experimental gear to warrant statistical examination. We did, however, attained 67 sturgeon, 22 of which were used to augment tracking studies that are researching spatial and temporal distribution patterns of sturgeon.

In order to improve catch numbers so that reliable analysis can be made, we are proposing to repeat the study in 2010 with an earlier start date. Since gear is already in possession only having to be rehung this will allow us to start at anytime and only have to purchase webbing. Another year of data will allow for more robust analysis, a necessary element if this data should be used by VMRC to tailor better regulations.

Signature: George E. Trice IV Date: 7-15-09
George Trice