Final Report of Fishery Resource Grant Project 2014

Conducted by George Trice

Project Title: Observing Striped Bass Catch and Atlantic Sturgeon Bycatch In A striped Bass Fishery Using Raised Footlines in the Chesapeake Bay.

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Brief Summary

This project was conducted from March 1, 2014 to March 25, 2014. The project documented the catch of striped bass (*Morone saxatilis*) catch and Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) bycatch of two different net configurations, a traditional anchored gill net and an experimental raised footline anchored gill net (Figure 1a, 1b). The project was conducted using large mesh (20.3 cm stretch mesh) in a traditional striped bass fishery area in the Chesapeake Bay (Figure 2.) Traditional river fisheries which usually use 12.7 and 15.2 cm stretch mesh nets were not observed. The experimental methodology was created in an attempt to determine Atlantic sturgeon bycatch in the specific fishery location and reduce the bycatch of Atlantic sturgeon while not affecting the striped bass fishery. Nets were hung using conventional methods allowing the net to rest on the bottom of the waters. Experimental nets were hung with a 1 meter bottom panel with no mesh allowing bottom dwelling fishes to swim under the "floated" net mesh. Atlantic sturgeon and striped bass catches were recorded and compared to determine the effects of the different hanging methods and get a better estimate on Atlantic sturgeon bycatch in Virginia's striped bass bay fishery. For the duration of the study one Atlantic sturgeon (March 22, 2014) was caught in the standard gear configuration and none were caught in the experimental configuration. The Atlantic sturgeon was estimated to have a fork length of 850 mm and was released alive. A total of 915 striped bass were caught for a total weight of 7,292 kg. There was no significant difference in striped bass catch numbers between standard (440) and experimental (475) gear.

Methods

Nets were set on February 28, 2014. From March 1 to March 25 twenty-five trips were taken to a traditional striped bass fishing area (Figure 2), water depth varied from 3 to 4 meters deep. Nets were fished about every 24 hours. All nets for the project were 20.3 cm stretch mesh, 25 meshes deep, and hung on a 2:1 ratio. The 2:1 ratio means two meshes were hung on every 20.3 cm. Standard nets were hung using conventional gill net methods that position the mesh along the bottom of the water column (Figure 1a). The experimental method of raised footlines created a "stationary float net" (Figure 1b). Nets having the raised footlines were floated 1 meter from the bottom. A total of four nets were fished

consisting of four 91 m sections, two standard and two experimental sections. The four sections were hung in an alternating fashion (Figure 3). Catch was identified and counted. Catch data were recorded and analyzed to determine the efficiency of the two net configurations with respect to striped bass catch and Atlantic sturgeon bycatch. An unpaired t-test was used to determine if there were any significant differences between the catch of the two gear types.

Analysis

A total of 915 striped bass were caught with 440 (48%) caught in conventional nets versus 475 (52%) caught in the experimental nets. The total striped bass weight captured was about 7,292 kg. Catch-per-unit-effort (CPUE) units are fish caught per 91 m X 4.4 m (estimated depth of net fished for a 20.3 cm stretch mesh net, 25 meshes deep, hung 2:1) of net per 24 hour set. The overall CPUE of striped bass in standard gear was 4.4 and 4.75 for experimental gear. Daily CPUE was almost the same throughout the study period (Figure 4) and an unpaired t-test (t=0.2781, p=0.7812) showed there was no significant difference between experimental and standard gear CPUE. Around March 20 grass drifted into the area and fouled the standard nets worse than the experimental nets. The experimental nets had higher catch rates when the grass moved into the area (Figure 4). It appears the raised footline allowed the grass to pass underneath of the mesh and foul the net less than traditional gear.

Only one Atlantic sturgeon (estimated 85 cm fork length) was caught during the project. The Atlantic sturgeon was caught in standard fishing gear on March 22, 2014. The Atlantic sturgeon was caught and released alive at 37.125129, -76.289244.

Conclusions

Because 2014 Atlantic sturgeon bycatch collections were low it is hard to make strong inferences between the two gear types. It is positive to note that the one Atlantic sturgeon captured was in traditional gear and not the experimental gear. The experiment showed that Atlantic sturgeon bycatch in this location was low, however; this the catch could easily change from year to year. The experiment was successful in showing there does not appear to be a significant difference in striped bass CPUE between the two gear types. The experimental gear caught better when grass moved into the area which was an unexpected-positive finding. Future work is needed in the Chesapeake Bay proper to determine if catch rates of striped bass vary between the two gear types.

Final Summary

The use of raised footlines continues to have lower bycatch of Atlantic sturgeon, even when very few fish are caught. There was only one Atlantic sturgeon collection while 7,292 kg of striped bass were harvested. The one Atlantic sturgeon was released in good health. The experimental and standard gears have similar catches rates of targeted species with the experimental catching slightly better during the later part of the study period.

Signature_____Date____5-20-14_____
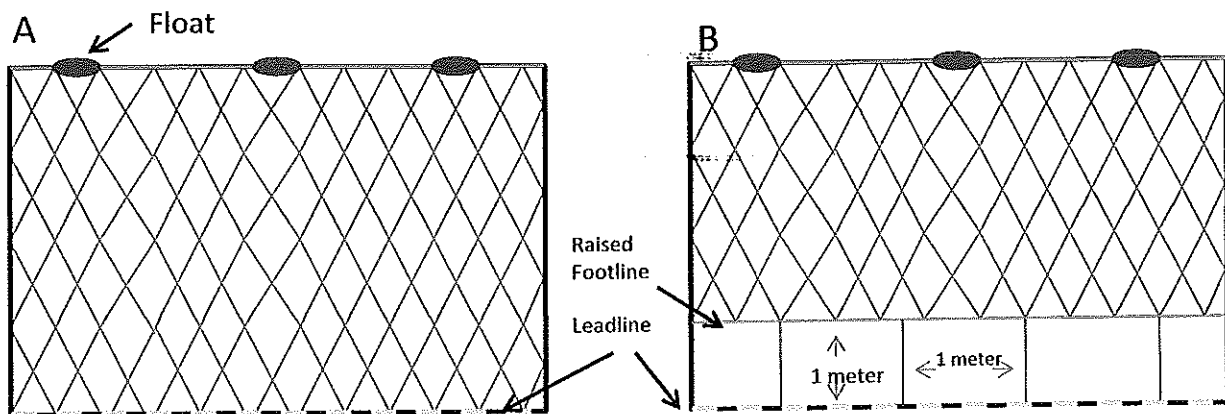
Figure 1. Configurations of two net types used during the project. A) traditional gill net which mesh going along the ground. B) Experimental gill net with 1 meter opening along the bottom allowing benthic fish to pass underneath of the mesh.
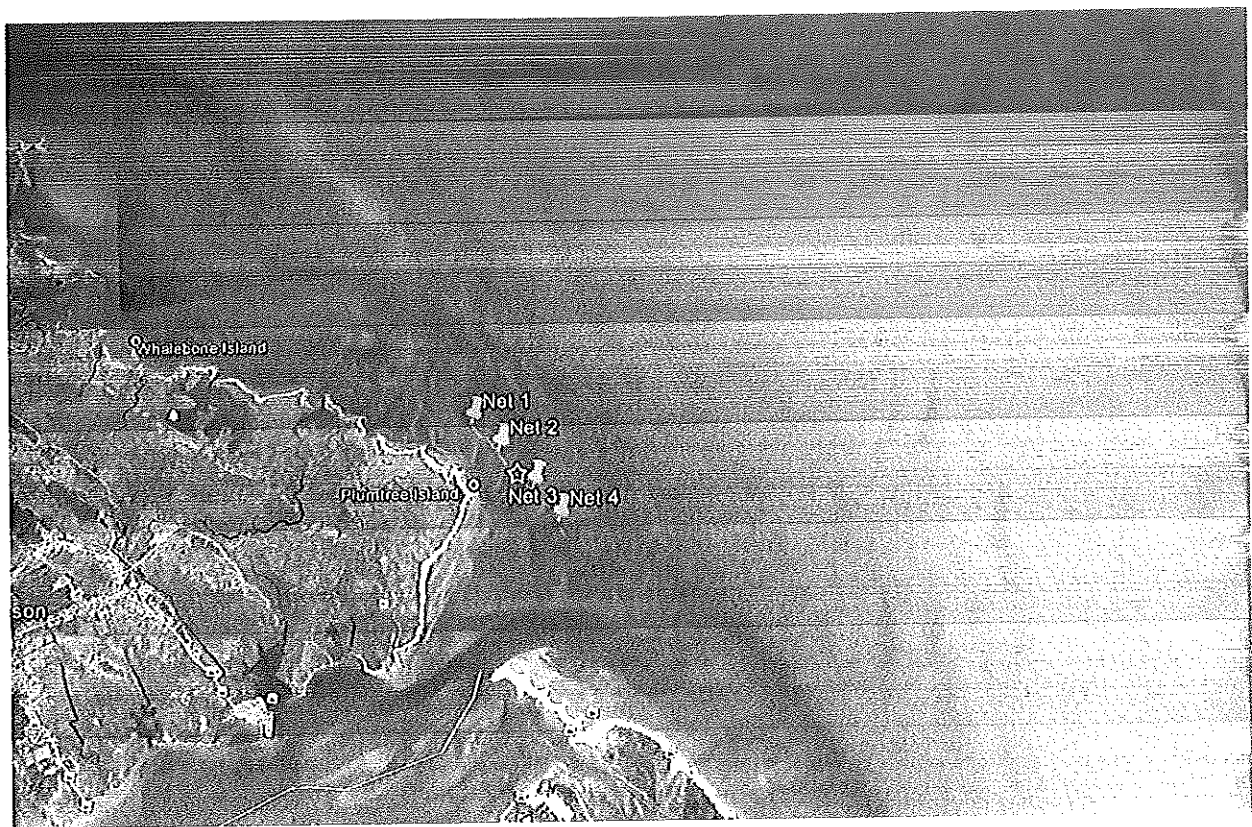
Figure 2. Map showing where the four nets were fished. The star is the location of the Atlantic sturgeon capture and release.

Figure 3. Diagram showing the configuration of the nets set during the project.
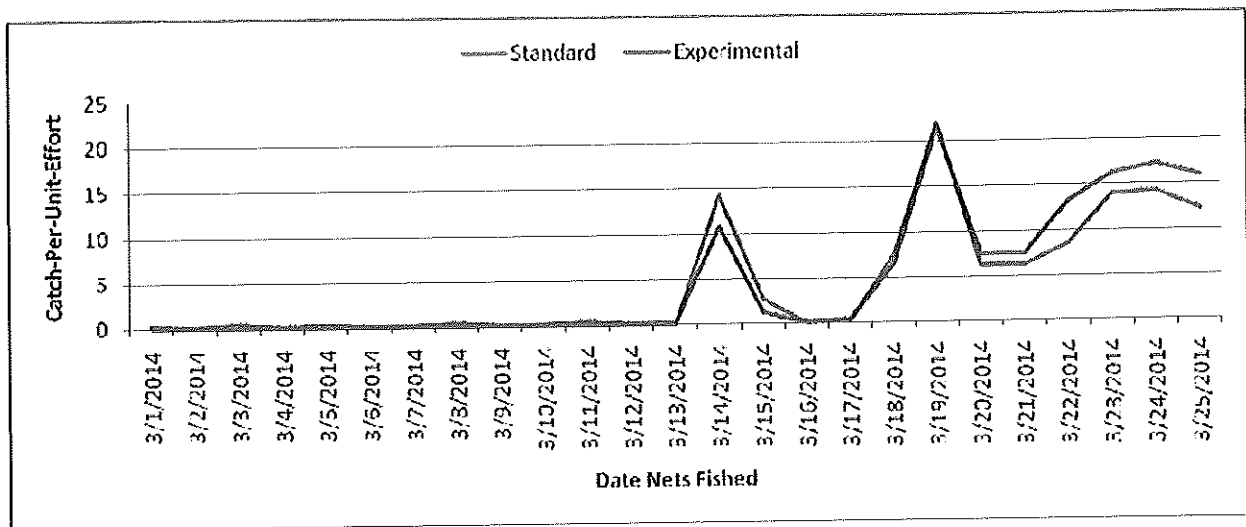
Figure 4. Daily catch-per-unit- effort during the project. effort was considered to be one 91 m X 4.4 m net set for 24 hours. The striped bass entered the area during the middle of the study period and the quota was caught up on March 25.

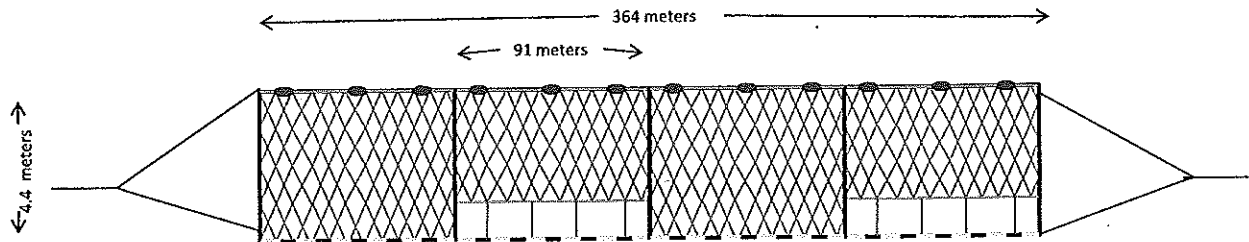| Data		600 ft Stan	600 Exp	Soak time		Effort is 600 feet (183
3/1/2014	Net 1	0	0	24		
	Net 2	0	0	24		unpaired t-test
	Net 3	0	1	24		two tailed P Value is 0.
	Net 4	0	0	24		
3/2/2014	Net 1	0	0	24		t=0.2781
	Net 2	0	0	24		df=178
	Net 3	0	0	24		
	Net 4	0	0	24		
3/3/2014	Net 1	1	0	24		
	Net 2	1	0	24		One-Way Anove
	Net 3	0	0	24		F=0.077
	Net 4	0	0	24		P=781
3/4/2014	Net 1	0	0	24		Total df = 179
	Net 2	0	0	24		
	Net 3	0	0	24		
	Net 4	0	0	24		
3/5/2014	Net 1	1	0	24		
	Net 2	0	0	24		
	Net 3	0	0	24		
	Net 4	0	0	24		
3/6/2014	Net 1	0	0	24		
	Net 2	0	0	24		
	Net 3	0	0	24		
	Net 4	0	0	24		
3/7/2014	Net 1	0	0	24		
	Net 2	0	0	24		
	Net 3	0	0	24		
	Net 4	0	0	24		
3/8/2014	Net 1	2	0	24		
	Net 2	0	0	24		
	Net 3	0	0	24		
	Net 4	0	0	24		
3/9/2014	Net 1	0	0	24		
	Net 2	0	0	24		
	Net 3	0	0	24		
	Net 4	0	0	24		
3/10/2014	Net 1	0	0	24		
	Net 2	0	0	24		
	Net 3	0	0	24		
	Net 4	0	0	24		
3/11/2014	Net 1	0	0	24		
	Net 2	1	0	24		
	Net 3	1	0	24		
	Net 4	0	0	24		
3/12/2014	Net 1	0	0	24		
	Net 2	0	0	24		

	Net 3	0	0	24
	Net 4	0	0	24
3/13/2014	Net 1	0	1	24
	Net 2	0	0	24
	Net 3	0	0	24
	Net 4	0	0	24
3/14/2014	Net 1	12	8	24
	Net 2	17	15	24
	Net 3	7	9	24
	Net 4	21	11	24
3/15/2014	Net 1	2	3	24
	Net 2	1	0	24
	Net 3	5	2	24
	Net 4	3	0	24
3/16/2014	Net 1	0	0	24
	Net 2	0	0	24
	Net 3	0	0	24
	Net 4	0	0	24
3/17/2014	Net 1	0	2	24
	Net 2	1	0	24
	Net 3	0	0	24
	Net 4	0	0	24
3/18/2014	Net 1	11	7	24
	Net 2	4	2	24
	Net 3	7	5	24
	Net 4	8	12	24
3/19/2014	Net 1	27	21	24
	Net 2	19	14	24
	Net 3	22	26	24
	Net 4	20	25	24
3/21/2014	Net 1	14	17	48
	Net 2	8	12	48
	Net 3	17	23	48
	Net 4	11	8	48
3/22/2014	Net 1	11	14	48
	Net 2	15	21	48
	Net 3	3	10	48	One sturgeon in standa
	Net 4	5	8	48
3/24/2014	Net 1	31	46	48
	Net 2	25	29	48
	Net 3	22	17	48
	Net 4	35	42	48
3/25/2014	Net 1	23	35	24
	Net 2	26	29	24
		440	475	
		4.888889	5.277778		total weigh	16075
		8.608128	10.09286		total fish	915

Experimental		Per Net	Standard	Experimental
1	0	1	0	0.25
0	0	0	0	0
0	2	0	0.5	0
0	0	0	0	0
0	1	0	0.25	0
0	0	0	0	0
0	0	0	0	0
0	2	0	0.5	0
0	0	0	0	0
0	0	0	0	0
0	2	0	0.5	0
0	0	0	0	0
1	0	1	0	0.25
43	57	43	14.25	10.75
5	11	5	2.75	1.25
0	0	0	0	0
2	1	2	0.25	0.5
26	30	26	7.5	6.5
86	88	86	22	21.5
30	25	30	6.25	7.5
30	25	30	6.25	7.5
53	34	53	8.5	13.25
65	56	65	14	16.25
69	57	69	14.25	17.25
64	49	64	12.25	16
			4.4	4.75

Standard ·········· Experimental

Date Nets Fished

m) by 14.4 feet (4.4 m) per d	Standard	C Experimental CPUE
	0	0
	0	0
7812	0	1
	0	0
	0	0
	0	0
	0	0
	0	0
	1	0
	1	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	1	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	2	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	0	0
	1	0
	1	0
	0	0
	0	0
	0	0

Totals	Stanard
3/1/2014	0
3/2/2014	0
3/3/2014	2
3/4/2014	0
3/5/2014	1
3/6/2014	0
3/7/2014	0
3/8/2014	2
3/9/2014	0
3/10/2014	0
3/11/2014	2
3/12/2014	0
3/13/2014	0
3/14/2014	57
3/15/2014	11
3/16/2014	0
3/17/2014	1
3/18/2014	30
3/19/2014	88
3/20/2014	25
3/21/2014	25
3/22/2014	34
3/23/2014	56
3/24/2014	57
3/25/2014	49

Catch-Per-Unit-Effort

25
20
15
10
5
0

3/1/2014
3/2/2014
3/3/2014

0	0
0	0
0	1
0	0
0	0
0	0
12	8
17	15
7	9
21	11
2	3
1	0
5	2
3	0
0	0
0	0
0	0
0	0
0	2
1	0
0	0
0	0
11	7
4	2
7	5
8	12
27	21
19	14
22	26
20	25
7	8.5
4	6
8.5	11.5
5.5	4
5.5	7
7.5	10.5
1.5	5
2.5	4
15.5	23
12.5	14.5
11	8.5
17.5	21
23	35
26	29

ard

7292 kg