the Shellcracker

FLORIDA CHAPTER OF THE AMERICAN FISHERIES SOCIETY http://www.sdafs.org/flafs

July, 2011

President's Message:

Greetings from South Florida,

Well, the Cubans are at it again… yes, they've made yet further steps lately to open more of their Exclusive Economic Zone (EEZ) to deep-water oil exploration in waters between 400 and 1500 meters. Drilling is expected to start in the next couple months by Spanish oil exploration company Repsol using a $750 million semi-submersible rig from Singapore. From the various news reports, as many as 11 international firms are all working with Cuba for exploration – and eventually production – rights in these waters.

In a larger context, I'm generally encouraging of countries wisely using their natural resources, whether of renewable ones like fisheries or the extractive ones like minerals. However, that encouragement is always predicated on safe extraction methods. Oil extraction in deep waters is inherently a difficult process, even as the techniques and equipment has become increasingly refined over time. We all now know well within Florida and the rest of the Gulf of Mexico that even the relatively high safeguards in place with oil extraction inside the U.S. EEZ can fail, and that the predetermined plans for such emergencies don't always work as envisioned. More importantly for this new drilling, the government of Cuba has generally rebuffed efforts by the United States (and others, including the Bahamas) to participate in a regional plan for oil containment. We don't exactly have great relations right now with Cuba; imagine having an international negotiation session *before* mounting a large-scale response to an oil spill emergency. It's not a pretty picture in 3-knot waters!

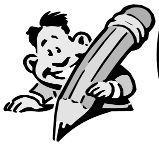
Natural resource extraction, international corporations, EEZs – this would be an esoteric discussion for most chapters of the American Fisheries Society, but not for ours. The impacts of these decisions still being made 90 miles across the Florida Straits indeed have potentially devastating consequences for our Florida Chapter should a deep-water spill occur in Cuban waters. Not only would the Florida East Coast experience what the Florida West Coast and the rest of the Gulf of Mexico did, but there is the additional potential for such a spill to be that much worse due to a lack of coordinated response.

So, what can we do about it? In the international affairs context, probably not very much – even my colleagues within the State Department recognize that we don't have much leverage as the United States when it comes to Cuba right now. On the domestic side, there may not be much either, although I always will encourage folks to contact their political representatives with issues and opinions. What we can do, however, is to do what we can to encourage monitoring of our resources, and especially the archiving of biological samples. As many of us know, one of the continuing problems regarding the Deepwater Horizon Event (DWE) was the lack of large-scale monitoring and archiving programs in the Gulf of Mexico, and people would be surprised how much interest gets shown for even the relatively few pre-DHE samples. I encourage you to collect such opportunistic samples as often as possible, and such collections are also great opportunities for professional collaborations.

Being fisheries professionals who tend to spend time in the field, we all know what environmental treasures are at stake here in Florida. Let's incorporate just a little additional foresight into our existing work to better do what we can to keep them.

Dave Kerstetter
FL AFS President

For more information on these leases, here are three of the better recent news stories (and maps) about them and the current state of affairs on the process:
http://www.nytimes.com/2010/09/30/world/americas/30cuba.html
http://seattletimes.nwsource.com/html/nationworld/2015502957_cubaoil04.html
http://www.miamiherald.com/2011/06/12/2285003/cubas-oil-our-potential-mess.html



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Upcoming Events

August 1 – 4, 2011: Sixth World Recreational Fishing Conference. Berlin, Germany. www.worldrecfish.org

September 4 – 8, 2011: AFS 141st Annual Meeting. Seattle, Washington. www.afs2011.org

Check out our Parent Society's calendar at http://www.fisheries.org/afs/calendar.html for other events not listed here!

New Titles

Invasive Asian Carps in North America. Duane C. Chapman and Michael H. Hoff, editors. 265 pages. Published by the American Fisheries Society. June 2011.

Biology, Management, and Culture of Walleye and Sauger. Bruce A Barton, editor. 570 pages. Published by the American Fisheries Society. June 2011.

The Angler in the Environment: Social, Economic, Biological, and Ethical Dimensions. T. Douglas Beard, Robert Arlinghaus, and Stephen G. Sutton, editors. 365 pages, Symposium 75. Published by the American Fisheries Society. July 2011.

Interested in contributing something to the Shellcracker? Email Kevin Johnson at *kevin.johnson@myfwc.com* with any articles or information that you would like to be included in the next issue. The deadline for the next issue is September 30th, 2011, so start fishing...

Feature Article

Florida's new long-term Black Bass Management Plan, approved by Commission

Bob Wattendorf and the BBMP Team

The Florida Fish and Wildlife Conservation Commission (FWC) approved the agency's *Florida Black Bass Management Plan* (Plan) on June 9, 2011 at a meeting in St. Augustine. The plan, initiated by FWC's Division of Freshwater Fisheries Management, is the outcome of more than a year of concerted effort to obtain public input, and review and refine ideas in context of the best available science and socio-economic realities.

The vision the plan seeks to fulfill is: "The worldwide angling public recognizes Florida as the Bass Fishing Capital of the World, based on great resources and responsible management. Florida's bass fisheries provide outstanding ecological, social and economic benefits to the state of Florida."

The Plan incorporates widespread public input from over 7,500 survey responses, public events and meetings, as well as input from a citizen's Technical Assistance Group (TAG), and FWC staff from multiple divisions and offices. The stated goal of the plan is "To ensure Florida is the undisputed Bass Fishing Capital of the World."

The FWC will use the plan as a road map and for impetus in dedicating and acquiring resources to fulfill the goal and realize the vision. Although the management plan period is 2010-2030, this "living" document will allow adaptive management, public input and new scientific breakthroughs to continually help us improve our results.

Our purposes are:

- Create a scientifically justified document to guide FWC efforts for the enhancement and conservation of black bass species (*Micropterus* spp.) in Florida.
- Ensure the public has open input into the objectives and priorities to create ownership and provide support for conservation efforts.
- Be proactive and open to new ideas.

Florida is already recognized as the "Fishing Capital of the World" based on the number of freshwater and saltwater anglers, amount of time spent fishing, economic impact, diversity of recreational species, international fishing records set here and tourists who use our resources. Now we want that same recognition specifically for North America's most sought after game fish—the black basses. Bass anglers spend more than 14 million days fishing in Florida each year, which generates $1.25 billion for the state's economy. With 3 million acres of freshwater lakes, ponds, and reservoirs, and 12,000 miles of rivers, streams, and canals, Florida is a premier destination for bass anglers. However, we don't always get top billing in the recreational fishing community when it comes to bass, and we want to proactively change that by implementing this new plan.

The Florida largemouth bass (*Micropterus salmoides floridanus*) is genetically unique and has been stocked worldwide because of its potential for rapid growth to trophy size (10 pounds or heavier). Every year, a few Florida anglers catch 13- to 15-pound trophy largemouth bass. Moreover, Florida has shoal (*M. cataractae*), spotted (*M. punctulatus*) and Suwannee bass (*M. notius*), each one of which exists only in discrete areas and requires specific habitat and prey to maintain its population.

The fishing public perceives Florida to be among the top bass fishing states, but the fishery and trophy fish availability are somewhat depleted from historic levels in many localities, as documented in big-fish tournament records over the past several decades. Numerous pressures challenge fish management, including human population growth and development, declining water quality and current water management and fish management policies. Climate change, including precipitation and sea level changes, may create additional impacts. Preliminary surveys of stakeholders indicate overall satisfaction with the fishery but some concerns about negative impacts on bass populations and fishing opportunities, and the need for an enhanced management strategy.

This plan is action-based. It will help FWC staff develop solutions for management issues such as habitat enhancement, aquatic plant management, fisheries regulations and appropriate stocking plans. FWC staff will also use it to improve communications about angling ethics and opportunities, ensure fishing access, and reach out to youth to keep them engaged in recreational fishing and conservation.

The plan will be integrated with other local, state and federal programs. Effective implementation of the plan should benefit fishing-dependent private businesses and create jobs, including those that indirectly profit (gas stations, local grocers, motels, and restaurants), and riparian landowners whose waterfront property values are affected by aesthetics and fishing quality.

Highlighted below are some of the most innovative and key action items contained in the plan, which is divided into the following categories.

New opportunities

Identify new or special opportunities to create or substantially enhance black bass fisheries, and ensure FWC is proactive about opening new fisheries for the public. Successfully implementing new opportunities will require an aggressive, proactive, science-based approach that also involves local citizenry.

- Pursue public access to reservoirs during their planning phase, and develop management plans and cooperative agreements to produce appropriate trophy black bass fisheries.
- Make it easy for the public to find places to fish and freshwater public access (ramps, piers, shoreline access) using electronic and print media.
- Formalize partnerships with water management districts; federal, local and state government agencies; and private landowners to enhance public access.
- Help local communities attract major bass tournaments by enhancing ramps and associated facilities that will benefit local economies and anglers.
- Implement complete de-water renovations on aging reservoirs and lakes with water control structures to stimulate trophy largemouth bass fisheries.

Habitat management

Habitat management is the most important component of maintaining good fisheries.

- Prevent habitat degradation in areas of existing healthy habitat in collaboration with other agencies as needed.
- Manage native plants to create and maintain a symbiotic relationship between plants, fish, and people that will improve and sustain black bass fisheries.
- Implement FWC's new hydrilla- management position on specific water bodies to improve largemouth bass fishing.
- Partner with WMDs and the Corps of Engineers to develop new water regulation schedules and to monitor and recommend minimum flows and levels to help maintain healthy black bass populations.
- Improve bass habitat conditions by manipulating water levels for fisheries enhancement purposes.

Fish management

Black bass management generally involves actions that affect rates of recruitment, growth, natural mortality, and fishing mortality for bass.

- Establish customized harvest regulations to manage black bass populations at selected water bodies.
- Determine the potential effects of bed fishing on black bass populations.
- Ensure genetic diversity, fitness, and conservation of Florida largemouth bass.
- Ensure the genetic integrity, fitness, and conservation of endemic black bass within Florida Panhandle river systems.
- Stock fingerling (Phase-I, about 1 inch long) largemouth bass into new reservoirs and into lakes following major fish kills or droughts.
- Stock advanced-sized (Phase-II, 4-6 inches) largemouth bass fingerlings into water bodies where recruitment is limited.

People management

Human dimensions are critical to effective implementation of a black bass management plan, including communication, education, ethics, outreach, marketing, partnerships, tournament management, user conflicts, trophy bass documentation, data monitoring, imperiled species, and law enforcement.

- Implement a trophy fish documentation and release program.
- Involve stakeholders early in the process of major, resource-specific management actions such as new regulations and major habitat renovations.
- Design and implement a complete marketing plan for the BBMP and Florida's bass fishing.
- Build partnerships with bass anglers, other stakeholders, government agencies, institutions, and private industry to complete fishing and lake improvement projects.
- Cooperate with the bass tournament industry and citizens to effectively manage bass tournaments to minimize negative perceptions.

Obviously, this is an ambitious plan. Although some aspects are well under way and will only need some tweaking, other items are new concepts or ones that we are determined to find funding and support for whereas in the past limited budgets have prevented implementation. As members of the Florida Chapter of the American Fisheries Society, we believe most if not all of you will support and have suggestions pertaining to the scientific management of our fisheries, and we welcome your input and advice.

One of the most exciting and visible aspects of this plan in the short-term will be a new TrophyCatch program. This is a huge expansion on the existing Big Catch angler recognition program specifically focusing on big bass and using a tiered approach so that 8-10 pound bass will continue to be recognized, but anglers catching and releasing trophies of 10-12 pounds will attain additional bonuses. Those catching and releasing 12-13 pound hawgs will have even more exciting incentives. However, the real prizes will be awarded to those who catch and release bass during the cooler months that exceed 13 pounds. These fish will need to be certified by the FWC and merchandise awards for each fish could be in the thousands of dollars. In additon, they will be entered into a Florida Bass Hall of Fame (probably at the Florida Bass Conservation Center) and have opportunities for a random prize drawing among 13-pound club members, the biggest fish of the year award, or a special new state record incentive.

Teams are working out the details now, especially regarding safe handling of these fish so that we can encourage not only documentation but effective live-release procedures. Corporate sponsors will provide all of the incentives. If you know of likely sponsor candidates, please let Bob Wattendorf (Bob.Wattendorf@MyFWC.com) know.

Other action items that are being addressed early in the process include passage of a new hydrilla-management policy, additional research initiatives and developing trial e-tournament procedures. E-tournaments will encourage immediate live release of bass in tournaments with minimal holding of fish for weigh-ins, thus alleviating mortality and issues with releasing fish outside their home range.

The Plan was designed for the long term, and we look forward to your assistance in implementing it and help with refining the details.

To see the entire plan and collateral materials, please visit: MyFWC.com/fishing/freshwater/black-bass/

Abundance Profile of Sheepshead (*Archosargus probatocephalus*) in the Indian River Lagoon

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ABSTRACT:

According to previous studies, salinity and dissolved oxygen levels have an impact on fish habitat location. The purpose of this study was to determine the effect of salinity and dissolved oxygen on Sheepshead, *Archosargus probatocephalus* abundance in the Indian River Lagoon (IRL). It was hypothesized that these water quality parameters would be sufficient indicators of Sheepshead abundance throughout the lagoon. Thirty random samples from four zones in the IRL were analyzed using data gathered from a Florida Fish and Wildlife database. Regression analysis of salinity versus abundance and dissolved oxygen versus abundance revealed that there is no significant relationship between them. However, significant differences in abundance did occur between the four zones. Results of the study were inconclusive as to which factors most significantly cause changes in abundance between locations.

INTRODUCTION:

Archosargus probatocephalus, also known as the Sheepshead is found in inshore waters of the western Atlantic from Nova Scotia to Mexico, and is very common along the southeastern US and Gulf of Mexico. Adults are found around rock pilings feeding on encrusting organisms. Spawning takes place in the spring usually from April to May in the temperate area of north Carolina and as early as the beginning of March in the more subtropical southern Florida (Mook, 1977). Biological factors of a habitat, including salinity and dissolved oxygen, may be analyzed in order to predict locations where this fish will have populations of the highest concentration. In a study done from 1996-1998 in the Indian River Lagoon (IRL) in Florida, *Archosargus probatocephalus* was among the top ten most abundantly caught fish, proving it to be very common and plentiful in the area. The study tested salinity levels at the sites and determined it to be one of the most consistent indicators of species groupings among the most abundant fish in the IRL (Kupschis, 2000).

In a similar study done on the effect of temperature and salinity on various aquatic life processes, it was observed that growth, food intake, and food conversion vary greatly within different areas of salinity concentration (Kinne, 1960). How well a fish species can survive and increase its abundance may be determined, in part, by the amount of salinity in its surrounding habitat. This may then be used as an indicator of where the highest species abundance can be located.

Dissolved oxygen is vital for fish survival and is necessary to be in high concentrations. Fish react to reduced availability of dissolved oxygen negatively, including changes in activity, increased use of air breathing, increased use of aquatic surface respiration, and vertical and horizontal habitat changes (Kramer, 1987). Therefore, dissolved oxygen levels may also be a good indicator of where a given species of fish will be most abundant.

The purpose of this study performed here was to determine if the abundance of Sheepshead (*Archosargus probatocephalu*) varies according to location and water quality parameters in the Indian River Lagoon (IRL). It is expected that there will be a significant relationship between abundance and the water quality parameters, which will explain variation in abundance throughout the lagoon. The knowledge gained from this study will help researchers to better understand what drives sheepshead population structure in the IRL, which could lead to the development of more efficient conservation and management practices.

MATERIALS AND METHODS:

All data for this study was obtained from a Florida Fish and Wildlife Conservation Commission database that contained sampling results from the Indian River Lagoon for two species of fish: sheepshead (*Archosargus probatocephalus*) and snook (*Centropomus undecimalis*). The FWC divided the IRL into ten zones from Vero Beach to the Mosquito Lagoon [Figure 1]. Data was collected monthly from January 1990 to December 2008. The database included abundance measurements for the two species of fish, as well as vegetation and substrate information and salinity, dissolved oxygen, and temperature measurements for each sample. Fish were caught via seining. In water less than 1.5 m deep a 21.3 m center-bag seine with 32 mm of mesh was used. For sloping shorelines samples were obtained by manually dragging the seine 9.1 m perpendicular to the shore and then hauling the net on shore. Shallow seagrass beds were sampled by manually dragging the net 9.1 m and then bringing the poles together and retrieving the net offshore. For steep shorelines, the seine was deployed along the shore in an arc from the stern of the boat. In waters deeper than 1.8 m, a 6.1 m otter trawl with 3.2 mm mesh was used. Abundance values represented as a standardized number of fish caught per unit effort of 100 m2 (Paperno 2002).

Zones A, B, C, and D were selected for examination of sheepshead abundance. Thirty data points were randomly selected from each zone, and Microsoft Excel was used to organize the data. SPSS was used to run all statistical analyses. The data failed to meet the normality assumption, so non-parametric Kendall's tau-b Regressions were performed to compare salinity and dissolved oxygen levels to abundance. A non-parametric Kruskal-Wallis test was used to determine if there were differences in abundance between zones. The non-parametric Mann-Whitney U test for independent samples was then used to compare each zone to one another in order to determine where the variance occurred. The mean abundance values for each zone over all years were graphed to visualize the general relationships. Mean abundance values for each year with all for zones combined were also graphed to visualize trends. Bottom vegetation and substrate percentages for each zone, with all years combined, were calculated to see if they helped to explain any variation in abundance trends that was observed throughout the IRL.

RESULTS:

Kendall's tau-b regression analysis revealed that there was no significant relationship between salinity and sheepshead abundance (T_B= -0.098, p=0.179). Regression analysis also revealed that there was no significant relationship between dissolved oxygen and sheepshead abundance (T_B= -0.016, p=0.823).

Results from the Kruskal-Wallis test showed that there were significant differences in sheepshead abundance between the four zones: A, B, C, and D (H=17.148, d.f.=3, p=0.001). Subsequent Mann-Whitney U tests determined that the significant differences in abundance occurred between zones A and C (U=375.00, n_1=n_2=30, p=0.021), between zones A and D (U=300.00, n_1=n_2=30, p=0.001), and between zones B and D (U=314.00, n_1=n_2=30, p=0.003). The mean abundance values for each zone across all years are shown in Figure 3. The mean abundance values for each year across all zones are shown in Figure 4.

Analysis of vegetation type for each zone showed that seagrass dominated at each location with at least 50% cover for all zones [Table 1]. Similar analysis with bottom substrate revealed that mud was predominate in zones A and D with 53% and 57% occurrence respectively, and sand dominated zone B and C with 43% and 47% respectively [Table 2].

DISCUSSION:

The results from this study showed that there was no significant relationship between salinity and sheepshead abundance, nor between dissolved oxygen and sheepshead abundance. Contrary to the proposed research hypothesis, this means that dissolved oxygen and salinity values are not good predictors of sheepshead abundance in the Indian River Lagoon. However, the significant differences in abundance between the four zones suggest that location in the IRL does have an effect on the abundance of Sheepshead present. This variance does not appear to be purely a function of distance from the outlet of the lagoon into the ocean though, as zones B and D were shown to be significantly different, yet are roughly the same distance north from the outlet. Also, despite this same relative location in the lagoon, zone D was shown to be significantly different from zone C, while zone B was not shown to be different from zone C.

It does not appear that bottom vegetation or substrate play a significant role in structuring habitat preference. All four zones are strongly dominated by seagrass, so the difference in abundance does not originate here. Also, substrate does not appear to be a significant factor, as zones A and D, even though they possess significantly different sheepshead abundances, are both dominated by mud. One possible explanation for the disproportionately higher abundances in zone D is that it is functionally a protected area surrounding Cape Canaveral. Reduced fishing and human traffic in zone D likely accounts for the high Sheepshead abundances found here. However, there are clearly other unknown factors that drive population structure of Sheepshead throughout the remaining sample zones in the IRL. Future studies could include comparison across months to determine if seasonal variation and life cycle of the fish have a significant effect on Sheepshead populations in the IRL. Further analysis of the data could also include comparing the populations in the IRL to other estuarine habitats across the world to determine if significant patterns emerge.

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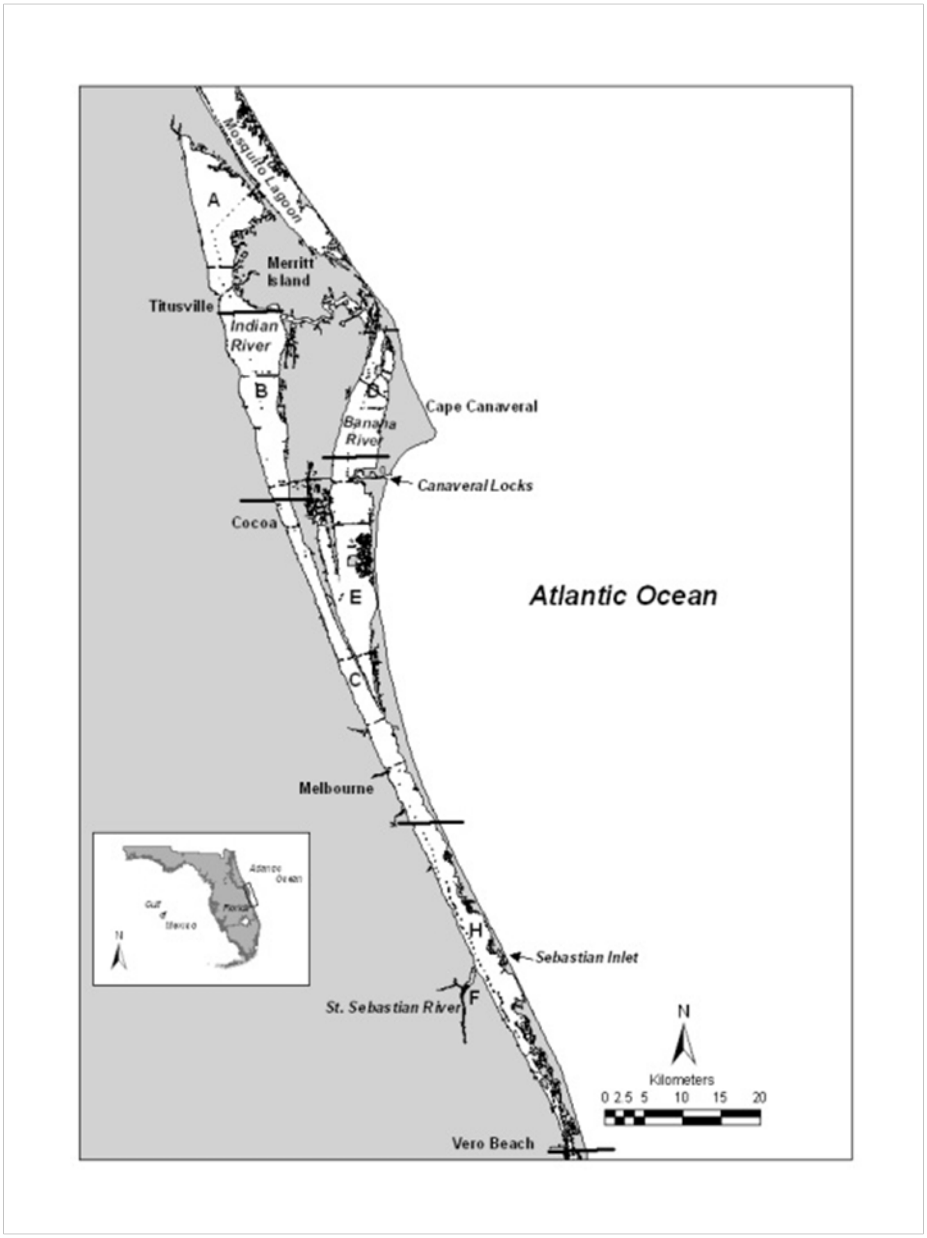

Figure 1: Study site for *Archosargus probatocephalus* abundance in the Indian River Lagoon, FL. Sample zones were A, B, C, and D.

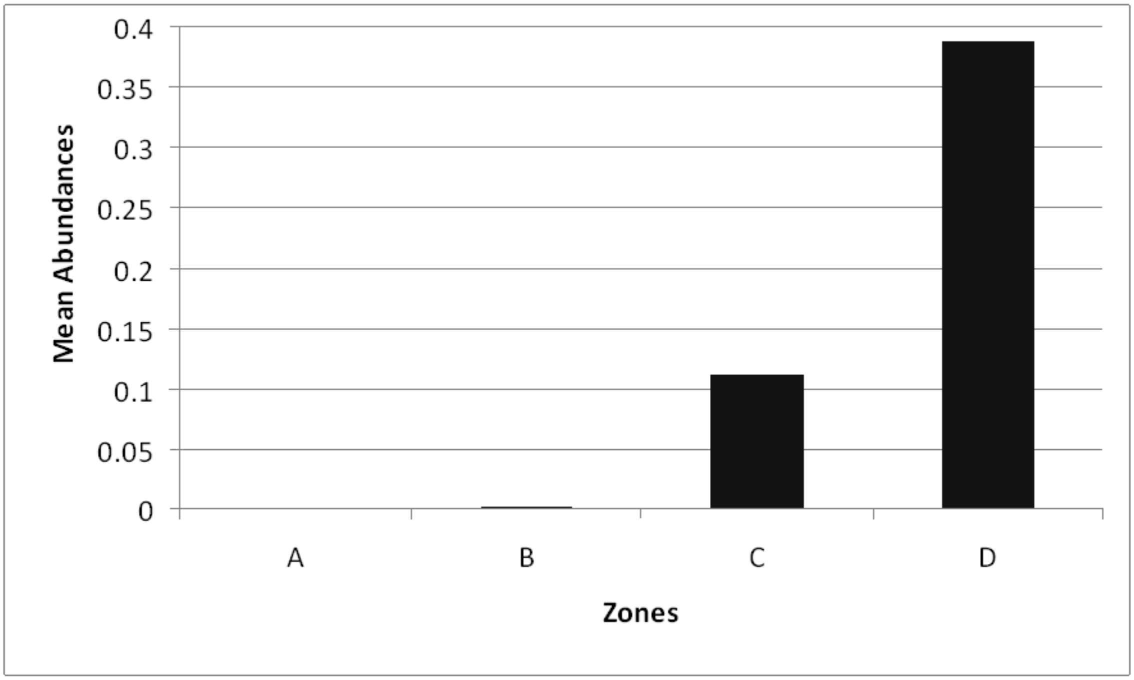

Figure 2: Mean abundances (# caught per 100 m^2) of *Archosargus probatocephalus* per IRL sample zone from 1990-2008. (A=0.0000, B=0.0021, C=0.1114, D=0.3886).

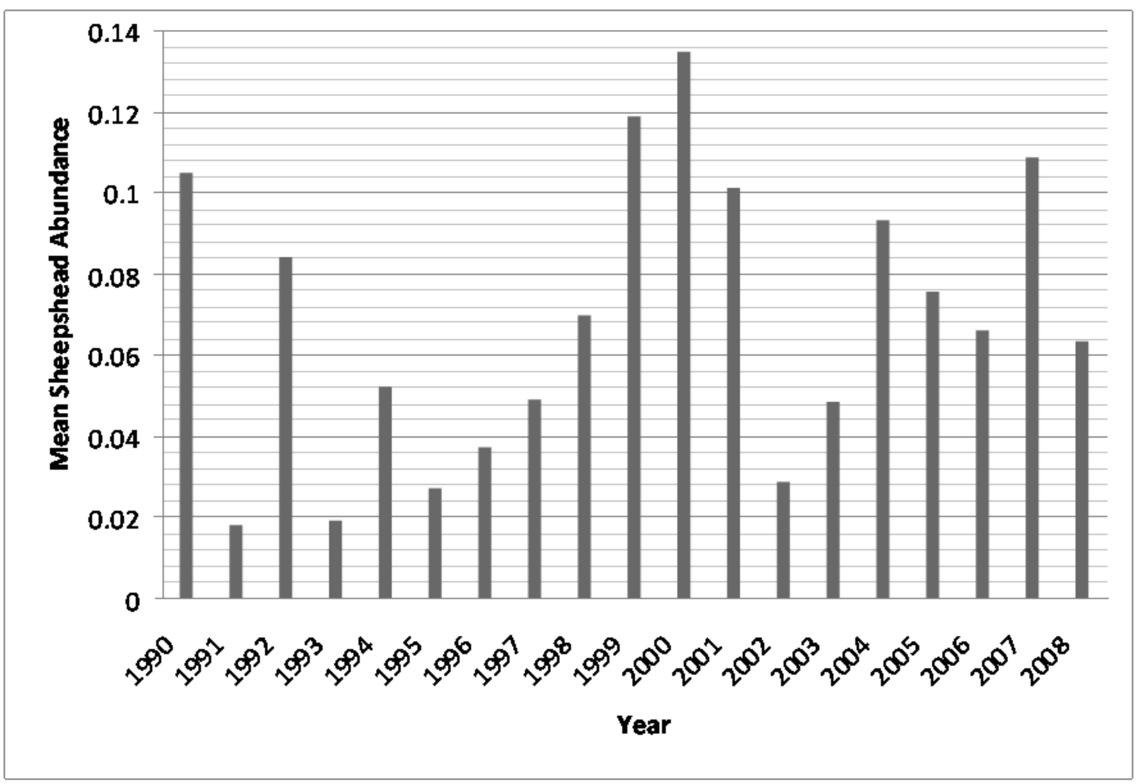

Figure 3: Mean abundances (# caught per 100 m^2) of *Archosargus probatocephalus* per year of study in all zones (A, B, C, D).

Table 1: Bottom vegetation profile for each sample zone in IRL study of *Archosargus probatocephalus* abundance.

Zone	%Seagrass	%Algae	% None	%Unknown
A	53	7	17	23
B	50	10	7	33
C	50	0	27	23
D	100	0	0	0

Table 2: Bottom sediment profile for each sample zone in IRL study of *Archosargus probatocephalus* abundance.

Zone	% Mud	% Sand	% Structure	%Unknown
A	53	30	0	17
B	30	43	0	27
C	33	47	7	13
D	57	43	0	0

Appendix A: Mean abundances (# caught per 100 m^2) of *Archosargus probatocephalus* per IRL sample zone from 1990-2008. [Figure 2]

Zone	Mean Abundance
A	0
B	0.0021
C	0.1114
D	0.3886

Appendix B: Mean abundances (# caught per 100 m^2) of *Archosargus probatocephalus* per year of study in all zones (A, B, C, D). [Figure 3]

Year	Mean Abundance
1990	0.104905
1991	0.018096
1992	0.084360
1993	0.019138
1994	0.051939
1995	0.026952
1996	0.037117
1997	0.048824
1998	0.069700
1999	0.118776
2000	0.134461
2001	0.100993
2002	0.028993
2003	0.048674
2004	0.093210
2005	0.075431
2006	0.065808
2007	0.108621
2008	0.063134

Appendix C: SPSS output for regression analysis of dissolved oxygen as the predictor variable for sheepshead abundance.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.438	120	.000	.120	120	.000

a. Lilliefors Significance Correction

Correlations

			Abundance	Dissolved_Oxygen
Kendall's tau_b	Abundance	Correlation Coefficient	1.000	-.016
		Sig. (2-tailed)	.	.823
		N	120	120
	Dissolved_Oxygen	Correlation Coefficient	-.016	1.000
		Sig. (2-tailed)	.823	.
		N	120	120

Appendix D: SPSS output for regression analysis of salinity as the predictor variable for sheepshead abundance.

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Unstandardized Residual	.409	120	.000	.150	120	.000

a. Lilliefors Significance Correction

Correlations

			Abundance	Salinity
Kendall's tau_b	Abundance	Correlation Coefficient	1.000	-.098
		Sig. (2-tailed)	.	.179
		N	120	120
	Salinity	Correlation Coefficient	-.098	1.000
		Sig. (2-tailed)	.179	.
		N	120	120

Appendix E: SPSS output for Kruskal-Wallis test for variances in abundance between zones A, B, C, and D.

Test Statistics[a,b]

	Abundance
Chi-Square	17.148
df	3
Asymp. Sig.	.001

a. Kruskal Wallis Test

b. Grouping Variable: Zone

Appendix F: SPSS outputs for Mann-Whitney U tests for variance between zones A, B, C, and D.

- Zones A&B:

Test Statistics[a]

	Abundance
Mann-Whitney U	435.000
Wilcoxon W	900.000
Z	-1.000
Asymp. Sig. (2-tailed)	.317

a. Grouping Variable: Zone

- Zones B&C:

Test Statistics[a]

	Abundance
Mann-Whitney U	387.500
Wilcoxon W	852.500
Z	-1.775
Asymp. Sig. (2-tailed)	.076

a. Grouping Variable: Zone

- Zones A&C:

Test Statistics[a]

	Abundance
Mann-Whitney U	375.000
Wilcoxon W	840.000
Z	-2.313
Asymp. Sig. (2-tailed)	.021

a. Grouping Variable: Zone

- Zones B&D:

Test Statistics[a]

	Abundance
Mann-Whitney U	314.000
Wilcoxon W	779.000
Z	-2.980
Asymp. Sig. (2-tailed)	.003

a. Grouping Variable: Zone

- Zones A&D:

Test Statistics[a]

	Abundance
Mann-Whitney U	300.000
Wilcoxon W	765.000
Z	-3.417
Asymp. Sig. (2-tailed)	.001

a. Grouping Variable: Zone

- Zones C&D:

Test Statistics[a]

	Abundance
Mann-Whitney U	389.500
Wilcoxon W	854.500
Z	-1.176
Asymp. Sig. (2-tailed)	.239

a. Grouping Variable: Zone