SALTWATER RECREATIONAL FISHERIES LICENSE PROGRAM
FY2011 ANNUAL REPORT

This report summarizes activities of programs funded by revenues from the sale of the SC Saltwater Recreation Fisheries License. The Saltwater Recreational Fishing Advisory Committee was created by law to assist in prioritizing the expenditure of these funds:

(a) the protection, maintenance, or enhancement of saltwater habitat important to the continued production of marine fish stocks and their food sources of significance to recreational saltwater fisheries;

(b) development of recreational saltwater fishing facilities;

(c) scientific research and management of recreational saltwater fisheries;

(d) other programs directly benefiting recreational saltwater fisheries recommended by the Saltwater Recreational Fisheries Advisory Committee.

For Fiscal Year 2011, the committee approved $1.638 million dollars to be spent on Marine Resources Division programs. Allocations were as follows:

Recreational Finfish Monitoring and Research	$583,000
Marine Outreach and Education	$120,000
Marine Fisheries Habitat Enhancement and Management and Recreational Shore-based Angler Fisheries Access Improvement	$300,000
Shell Recycling and Oyster Reef Management	$180,000
Recreational Crustacean Monitoring	$80,000

In addition, $375,000 was allocated for Marine Infrastructure which supported operations at the Waddell Mariculture Center in Bluffton which is instrumental in rearing fish for stocking experiments and other recreational-fisheries related activities. Other infrastructure funds were used to provide basic support of recreational activities including funds for boats and vehicles and their maintenance, as well as scientific equipment and supplies.

The following reports provide summaries of each program funded by SRFAC in fiscal year 2011. More detailed information about the Saltwater Recreational Fishing License program can be found at http://saltwaterfishing.sc.gov/ . To learn more about selected species visit http://www.dnr.sc.gov/marine/species/index.html.

SALTWATER RECREATIONAL FISHERIES LICENSE PROGRAM
FY2011 ANNUAL REPORT

Program Title: RECREATIONAL FINFISH MONITORING & RESEARCH

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Reporting Period: July 1, 2010 – June 30, 2011.

Program Objectives:

- Item 1. Trammel net survey: Monitoring of higher salinity (>8ppt) estuarine areas of SC.
- Item 2. Electrofishing survey: Monitoring of lower salinity (≤8 ppt) estuarine areas in SC.
- Item 3. Long-line survey: Monitoring of offshore areas of SC (outside the estuaries), focus on adult red drum and coastal shark species.
- Item 4. Fish bycatch in the Crustacean Management trawl survey: Monitor fish bycatch to compare current catch data with historical fish population data.
- Item 5. Fish wrack program: Measurements and biological samples from fish "wracks" (filleted carcasses) that anglers donate at conveniently located freezer locations.
- Item 6. Fish tournament program: Measurements and biological samples from fish caught at fishing tournaments.
- Item 7. Tagging program: Tag information from anglers that have caught a tagged fish.
- Item 8. Fish stock enhancement research: Conduct fisheries research and stocking programs with red drum, striped bass, and cobia to develop best management practices for implementation of a stocking program and to use stocked fish to better understand wild fish populations.
- Item 9. State Finfish Survey (SFS): Information on statewide saltwater fishing participation, catch and fishing effort.
- Item 10. Charterboat Logbook Program: Trip level logbook information of catch and effort from vessels carrying fishermen on a for-hire basis (captains/owners required to submit these data by law).

Summary of Activities / Accomplishments to Date:

Item 1. Trammel net survey

The trammel net survey began operating on a monthly basis in 1991 and is the longest running survey of the Inshore Fisheries section. It uses a 600-ft x 8-ft net in lower estuarine marsh-front habitat to capture

recreationally important fish such as red drum, spotted seatrout, black drum, sheepshead and flounder. Data from the survey are used for population assessments, annual compliance reports to the Atlantic States Marine Fisheries Commission, and numerous other scientific investigations such as DHEC mercury analysis and Masters student projects.

During the reporting period (Jul 1, 2010 – Jun 30, 2011), a total of 1063 trammel sets were made in nine survey areas (strata) along the SC coast (**Table 1**). This included two new strata that were added to the program last year (Broad and Colleton Rivers, both in Port Royal Sound), giving the most complete coverage of the South Carolina coastline in the survey's 20 year history.

The trammel survey caught a total of 17,157 specimens belonging to 71 species (**Appendix 1**). Fish were enumerated and measured before releasing the majority of them alive at the site of capture. A total of 6,489 biological samples was collected from a proportion of the specimens caught (**Table 2**), most of these being non-lethal fin clips for genetic investigations into population structure.

Table 1. Number of trammel sets per month in each sampling stratum during July 2010 - June 30 2011.

	2010						2011						
Stratum	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	**TOTAL**
ACE Basin	12	13	14	12	13	13	12	12	11	12	13	12	**149**
Lower Ashley River	12	13	13	11	16	12	13	12	13	11	12	12	**150**
Broad River	13	-	-	13	-	-	-	12	-	-	11		**49**
Charleston Harbor	12	10	14	11	11	11	12	10	12	12	10	13	**138**
Colleton River	13	-	-	13	-	-	-	13	-	-	13		**52**
Lower Wando River	11	12	11	12	12	12	12	11	12	13	10	10	**138**
Muddy/Bulls Bay	5	12	13	10	12	13	14	-	12	12	11	12	**126**
Cape Romain	12	11	11	13	13	13	13	13	14	12	12	13	**150**
Winyah Bay	-	12	11	12	10	11	10	-	12	11	11	11	**111**
	90	**83**	**87**	**107**	**87**	**85**	**86**	**83**	**86**	**83**	**103**	**83**	**1063**

Table 2. Number of biological samples collected from survey-caught fish during July 2010 – June 2011

Biological sample	**Purpose**	**Trawl**	**Longline**	**Electro**	**Trammel**	**Total**
Fin clip, blood or muscle	Genetics	345	108	1,373	4,346	**6,172**
Otoliths	Ageing	320	109	274	784	**1,487**
Whole specimen	Parasite screening (CofC)	101	31	364	468	**964**
Scales	Ageing		4		496	**500**
Gonads	Histology (sex and maturity)	20	107	103	234	**464**
Various	Special projects (requests)	-	-	103	112	**215**
Stomachs	Stomach content analysis		61			**61**
Muscle fillet	Mercury analysis (DHEC)				49	**49**
		786	**420**	**2,217**	**6,489**	**9,912**

Item 2. Electrofishing survey

The electrofishing survey began collecting monthly samples in 2001. It operates in upper estuarine waters using a specially designed electrofishing boat that temporarily stuns fish, allowing them to be

collected, measured and enumerated before releasing them alive. Its main purpose is to survey low salinity habitats, which are important settling areas for juvenile fish such as red drum and spotted seatrout, but are inaccessible with trammel net gear due to snags and currents.

During the reporting period, 374 electrofishing sets were made in six strata along the SC coastline (**Table 3**). This included the "Freshwater Ashley" stratum, which was added last year as part of a SCDNR project examining stocked striped bass survival and distribution patterns.

The electrofishing survey caught a total of 29,695 specimens belonging to 68 species (**Appendix 2**). Staff collected 2,217 biological samples (e.g. otoliths, scales, fin clips, etc.) from a proportion of the specimens caught (**Table 2**).

Table 3. Number of electrofishing sets made per month and stratum during July 2010 - June 2011.

	2010						2011						
Stratum	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	**TOTAL**
Waccamaw River	5	6	4		5	5	5	4	5	5	4	6	**54**
Upper Cooper River	5	7	5	5	3	6	6	5	6	5	6	5	**64**
Upper Ashley River	6	6	5	6	6	6	6	6	7	5	5	5	**69**
Freshwater Ashley River	6	6	6	5	6	6	6	6	5	6	6	6	**70**
Lower Edisto River	6	6	5	6	5	5	6		6	4	6	5	**60**
Combahee River	5	5	5	6	5	5	6		5	5	6	4	**57**
Total:	**33**	**36**	**30**	**28**	**30**	**33**	**35**	**21**	**34**	**30**	**33**	**31**	**374**

Item 3. Longline survey

The longline survey began during the 1990s and underwent an expansion and redesign during 2007. Its main purpose is to provide data on the adult population of red drum (~5 to 30 year old fish), which lives in deeper waters than the estuarine based sub-adult (< 5 years old) population. The survey also encounters numerous species of sharks. Data on both red drum and sharks are used for annual compliance reports to federal agencies, population assessments and numerous other related projects.

During the reporting period, 397 one-third mile longline sets were made in four survey strata along the SC coast (**Table 4**). These sets caught 1,672 specimens belonging to 33 species, of which red drum was the second most abundant (**Appendix 3**). Length measurements were taken from all specimens before releasing most of them alive at the site of capture. Staff sacrificed 109 red drum for otolith ageing, as requested by the Atlantic States Marine Fisheries Commission, and 420 biological samples were collected for a variety of scientific purposes (**Table 2**).

Table 4. Number of one third mile longline sets made during July 2010 – June 2011.

	2010					2011	
Stratum	Aug	Sep	Oct	Nov	Dec	Jun	**Total**
Charleston Harbor	6	29	17	41	6	12	**111**
Port Royal Sound	35		34	31			**100**
St. Helena Sound	33		31	32			**96**
Winyah Bay	28	17	15	30			**90**
Total:	**102**	**46**	**97**	**134**	**6**	**12**	**397**

Item 4. Fish bycatch in the Crustacean Management Trawl survey

The SCDNR Crustacean Management trawl survey began operating in the 1970s. It superseded a 1940s-1960s Bears Bluff Laboratory trawl survey and covers many of the same sites used by Bears Bluff. In 2010, SCDNR began recording information on the fish bycatch of the Crustacean Trawl survey so that comparisons could be made with historical fish population data that were collected by Bears Bluff. It also enables information to be gathered on certain managed species of importance, such as weakfish, which are only rarely encountered by the other SCDNR Inshore Fisheries surveys.

Fish bycatch was quantified in a total of 80 trawls made by the Crustacean Management Trawl Survey during the reporting period (**Table 5**). The program captured 28,491 specimens belonging to 56 species (**Appendix 4**).

Table 5. Number of crustacean management trawls for which fish bycatch was quantified.

Year	Month	Trawls
2010	Aug	8
	Sept	5
	Oct	4
	Nov	5
	Dec	15
2011	Jan	5
	Feb	6
	Mar	22
	Apr	2
	May	4
	June	4
	Total:	**80**

Item 5. Fish wrack program

The fish wrack program collects filleted carcasses that have been donated to SCDNR by recreational anglers at conveniently located drop-off freezers. It enables scientists to collect information on the size, age and sex composition of harvested fish, which is needed for population assessments.

Staff collected 278 fish wracks belonging to 6 species through the freezer program during the reporting period, with sheepshead accounting for more than half of those collected (**Table 5**). Length, sex and maturity (where possible) were determined for each specimen, and otoliths were extracted and preserved for ageing. Starting in 2010, a fin clip from each specimen was also preserved for population genetic investigations.

Table 6. Number of fish acquired from the freezer and tournament monitoring programs.

		Program		
Scientific name	Common name	Freezer	Tournament	**Total**
Archosargus probatocephalus	sheepshead	147	128	**275**
Cynoscion nebulosus	spotted seatrout	27	114	**141**
Sciaenops ocellatus	red drum	69	34	**103**
Paralichthys lethostigma	southern flounder	15	73	**88**
Pogonias cromis	black drum	15	5	**20**
Pomatomus saltatrix	bluefish		13	**13**
Chaetodipterus faber	spadefish	5		**5**
	Total:	**278**	**367**	**645**

Item 6. Fish tournament program

Like the fish wrack program, the tournament program enables information on the size, age and sex composition of harvested fish to be gathered. SCDNR staff members attend weekend tournaments and collect measurements and biological samples from certain species of interest. To ensure that no size bias occurs, all of a cooperating angler's harvested fish are examined, rather than just the trophy fish.

During the reporting period, SCDNR Inshore Fisheries attended seven fishing tournaments, including four from July-Nov 2010 and three from Apr-June 2011. Measurements and biological samples were obtained from 367 fish belonging to 6 species, of which sheepshead was the most numerous, followed by spotted seatrout and southern flounder (**Table 5**). The number of spotted seatrout examined was lower than last year because the 2011 tournaments removed the species from their competition list. This was in compliance with the voluntary release program promoted by SCDNR in response to the recent winter kill of spotted seatrout.

Item 7. Tagging program

During Inshore Fishery surveys, certain species of fish are tagged before releasing them so that information can be gathered on recapture frequency, movement patterns and fate of re-captured fish.

The trammel and electrofishing surveys tagged 3,117 fish belonging to four species between Jul 1, 2010 and Jun 30, 2011, with the majority being red drum (**Table 7**). Over the same period, 1,001 tagged fish were recaptured, of which 679 were caught by recreational anglers and 322 were caught by SCDNR surveys (**Table 8**). Approximately 78% (532/679) of the angler recaptures were released alive.

Table 7. Number of fish tagged by the Trammel and Electrofishing surveys period July 2010 – June 2011.

		Survey gear		
Scientific name	Common name	Electro	Trammel	**Total**
Sciaenops ocellatus	red drum	510	2,424	**2,934**
Archosargus probatocephalus	sheepshead	3	116	**119**
Pogonias cromis	black drum	4	56	**60**
Lobotes surinamensis	tripletail		4	**4**
Total:		**517**	**2,600**	**3,117**

Table 8. Recaptures of fish that were tagged during SCDNR trammel net and electrofishing surveys.

		Species			
Recapture method	Fate	Black Drum	Red drum	Sheepshead	**Total**
Recreational angler	Harvested	13	129	5	**147**
	Released	3	528	1	**532**
SCDNR surveys	Sacrificed		13		**13**
	Released	1	308		**309**
Total		**17**	**978**	**6**	**1,001**

Item 8. Fish Stock Enhancement Research

The DNR has a long history of aquaculture, stock enhancement, and fisheries research. Multiple funding sources are used to conduct fisheries research and stocking programs with red drum, cobia, and striped bass. Red drum is a popular recreational species and is managed through the use of size and creel limits. The SCDNR has invested in developing the technology to use stock enhancement as an additional tool for fisheries managers. Our research thus far has focused on developing the best management practices for implementation of a stocking program in addition to using stocked fish to better understand wild populations. Our specific project objectives included:

- Red drum stocking and evaluation research program:
  - Produce and stock 500,000 small juveniles (2 inch total length) in the Ashley River and Wando River to evaluate the impact on the Charleston Harbor estuary for three consecutive years.
  - Produce and stock larger-sized juveniles (6-7 inch total length) in the Wando River and in the ACE Basin to evaluate contribution of larger sized fish.
  - Use genetic tags to determine the contribution of stocked fish from previous years stocking efforts of a similar size and age one year after release.
- Striped bass stocking and evaluation research program:
  - Assist with stocking striped bass in the Ashley River and evaluate genetically all samples collected from fisheries independent sampling efforts to determine contributions of previously stocked fish.
- Cobia evaluation of stocking research progam:
  - Collect cobia life history data and determine contributions of previously stocked fish using genetic tools.

Red Drum:

During fall 2010, SRFAC funds were used in conjunction with Sportfish Restoration funds to produce and stock 880,511 small juvenile (2 inch TL) red drum into selected SC estuaries (**Table 9**). From this total, 729,050 were released in the Ashley River and 150,961 were released in the Wando River. In addition to the fall stocking, 21,481 medium juvenile (6 inch TL) red drum from the 2010 year class were stocked in spring 2011. Of this total, 15,769 fish were stocked in the Wando River and 5,712 were stocked in the ACE Basin. The results of these stocking efforts will be reported in 2012.

Table 9. Red drum stocking summary from SRFAC funding including the year class, average length at release and estuary where fish were stocked.

Year Class	Number Stocked	Total length (inches)	Estuary
2010	729,550	~1.75	Ashley River
2010	150,961	~1.0	Wando River
2010	15,769	~6.0	Wando River
2010	5,712	~6.0	ACE Basin

Our genetic evaluation of fish randomly sampled in the target estuaries is facilitated by using DNA fingerprinting that can be related back to the broodstock parents used to produce the stocked fish. Once fish are stocked, it takes approximately one year before any samples are collected by project staff or provided by cooperating recreational anglers. The genetic tags require only a small fin clip and allow a non-lethal and 99.99% accurate evaluation as to whether a sampled fish is wild or stocked. This effort is important to understanding the contribution that stocked fish make to the wild population and provides a measure of accountability to a responsible stocking program. We have processed a total of 1,166 red drum samples with SRFAC funds since last July. We have completed the analysis of the 2008 year class of fish stocked in the North Edisto River, the age 2 Cherry Grove samples, the 2009 year class Ashley River, Colleton River, and North Edisto samples, a small sample of 2010 year class Charleston Harbor samples, and the broodstock that will be used to produce the 2011 year class (Table 2).

Results suggest that fish size at stocking might not be the only important factor in the resulting contribution to the population. We see a large range in the proportion of stocked fish to wild fish seen in the collected samples and the contribution of stocked fish to the wild population appears to be affected by the size of the estuary, number of fish stocked, wild year class strength, and size of fish stocked (**Table 10**).

Table 10. Red drum contribution summary from past stockings for which SRFAC funds were used to process and analyze field collected samples.

Year Class	Estuary	Fish size at stocking	Number Stocked	Treatment Contribution (%)	Overall Contribution (%)
2008	North Edisto	1 inch	620,051	6.3	6.3
2008	Cherry Grove	1 inch	126,691	4.3	21.7
		6 inch	800	17.4	
2009	North Edisto	1 inch	461,159	7.5	7.5
2009	Colleton River	1 inch	471,373	16.7	16.7
2009	Ashley River	1 inch	629,924	76.0	76.0

Striped Bass:

The SCDNR has been stocking striped bass in the Ashley River since 2006 as part of several projects designed to evaluate the potential restoration of the extirpated population of striped bass back in this system. Stocking efforts have been implemented using both small 1-2 inch phase I juveniles stocked in the spring as well as 5-6 inch phase II juveniles stocked in the fall. Evaluation of stocking effects is accomplished using genetic analysis of randomly sampled fish collected monthly in the river similar to the red drum program.

SRFAC funds, in conjunction with funding from a South Carolina State Wildlife Grant, were used to produce a total of 128,014 phase I striped bass (1-2 inches TL) for stocking in the Ashley River in spring 2010 (**Table 11**). Of that total, 52,411 fish were released in the freshwater portion of the river and 51,533 were released in the brackish portion of the system. In addition, 24,050 striped bass (2 inch TL) were produced and stocked in the headwaters of the Ashley River (Shultz Lake). A total of 17,753 Phase II striped bass (6-10 inches TL) was produced and stocked in the Ashley River in the fall of 2010 with 11,762 released in the freshwater portion and 6,523 released in the brackish portion.

Table 11. Striped bass stocked in the Ashley River in 2010. Fish were produced at a freshwater facility (FW) or a brackish water facility (BW) and released into either the brackish or freshwater part of the river.

Production Treatment		Stocking Location	Number Stocked	Approximate Size at Stocking (TL(inches))
Phase I	FW Produced	FW	26,677	1.0
	FW Produced	BW	25,370	1.5
	BW Produced	FW	25,734	1.0
	BW Produced	BW	26,183	1.5
	BW Produced	Shultz's Lake	24,050	2
Phase II	FW Produced	FW	6,523	6.0
	FW Produced	BW	---	---
	BW Produced	FW	5,239	10.0
	BW Produced	BW	5,991	10.0

We also processed the 2010 year class striped bass broodstock samples with SRFAC funds during the last year. These data have been subsequently used to evaluate the field-collected samples from the Ashley River (processed with SK funds). We have completed the analysis of the samples collected January through December 2010, with 96.5% contribution of stocked fish. Of the cultured fish, one individual was stocked in 2006, nine fish in 2008, and the remaining 69 fish were stocked in 2009. Twenty-five phase I striped bass were collected, while 54 phase II striped bass were collected. The wild fish present for the first time in these collections may represent natural recruitment in this system. A summary of contribution from the 2010 stocking efforts will be provided in 2012.

Cobia:

In an effort to collect life history data on cobia in the Port Royal and St. Helena Sound area, project staff have developed a cooler program working cooperatively with local charter boat captains to collect fish racks, genetic samples and catch information. In addition, staff attend all cobia tournaments in the state and work with cooperating anglers to collect life history information such as age, growth, reproductive maturity, habitat and movement data. Genetic samples of all cobia are collected so that we can evaluate population structure as well as identify the contribution of stocked fish to the population.

In 2010, 221 otolith samples from SC waters were collected and processed to determine size-at-age and used to create catch curves for each year class. During spring 2011, 269 samples were collected. These data will be used in the cobia stock assessment being conducted by the South Atlantic Fishery Management Council.

We have processed 537 cobia samples from 2010 with SRFAC funds during the past year and have completed the genetic analysis of the 2010 field-collected samples. We have determined that 7.3% of all fish collected in 2010 were stocked from the Waddell Mariculture Center. Almost half (46.2%) of the

3 year old fish collected in Port Royal Sound in 2010 were from the 53,000 4-inch cobia stocked in 2007. In addition, 12.5% of the fish collected offshore of Port Royal Sound were stocked fish, as well.

Recommendations:

The project results presented here build upon our comprehensive applied fisheries research programs to provide sound scientific data upon which appropriate and responsible natural resource management decisions are based. Red drum, striped bass and cobia are three of the most important inshore recreational sport fish in SC. The Marine Division is coordinating efforts to more efficiently, and effectively evaluate the most pressing questions associated with these species using applied and conventional fishery research techniques. The information gained will enhance the effectiveness of the SCDNR in addressing natural resource issues by refining stocking strategies to improve survival and contribution as well as address the impacts of population growth, habitat loss, environmental alterations, and other challenges faced in protecting, enhancing, and managing these valuable resources. The results will also allow managers to utilize the most effective stocking strategies given local characteristics, improve enhancement efficiency, and increase post-stocking survival while providing data that will allow us to better understand ecosystem limitations to full recruitment. Our programs not only increase our knowledge of the population dynamics to increase the abundance of these recreationally important species, but also improves our understanding of the broader ecosystems they inhabit. Continued genetic evaluation provides critical population information for the proper management of these species in addition to determining hatchery contributions from experimental stockings.

Item 9. State Finfish Survey (SFS)

The SFS began in 1988 and is a roving dockside intercept survey. It allows MRD staff to monitor recreational fishermen's catch and fishing effort as well as provides an opportunity for staff to interact with the angling public. MRD staff interview recreational anglers at public and selected private access sites and charter boat docks throughout SC coastal counties. Data collected during interviews include: mode fished, specific body of water fished, resident county of boat owner, species targeted, number of anglers participating on the vessel, time spent fishing on trip, angling trips taken previous year, catch and disposition by species, length measurements for retained fish with anglers' permission, and otolith collection for selected species with anglers' permission. This survey provides data to help determine the components of finfish stocks that are being targeted by recreational anglers as well as recreational fishing effort and behavior. This information is used by managers on a state level, can be used to supplement and verify recreational fishing data collected by other surveys, such as the NMFS Marine Recreational Information Program (MRIP), and has been provided for potential use in fisheries stock assessments.

During the reporting period, 1,922 fishing parties were interviewed in private boat mode representing contact with 3,899 recreational fishermen. 95% of fishing parties interviewed fished in inshore waters, while 1% fished in nearshore state waters (0-3 miles offshore) and 4% fished in offshore federal waters (greater than 3 miles offshore). Interviews were conducted at public and selected private boat landings in all coastal counties throughout the reporting period (**Table 12**). The top species targeted by fishing parties were red drum (*Sciaenops ocellatus*), flounder (*Paralichthys sp.*), spotted seatrout (*Cynoscion nebulosus*), and spot (*Leiostomus xanthurus*). Fishing parties interviewed caught a total of 16,898 fish

belonging to over 84 species (**Appendix 5**) of which 35% were harvested by anglers and kept for consumption (**Table 13**). Of those fish harvested (**Appendix 6**), 3,554 finfish were measured by SCDNR staff belonging to 40 species. Fifteen species accounted for 95% of all finfish measured (**Table 14**). Additionally SFS staff collected otoliths from a proportion of selected species (black drum, bluefish, Atlantic croaker, weakfish, sheepshead, and spot) to assist other MRD projects.

Table 12. Number of site visits and completed interviews by SFS staff, per month, in each coastal region during July 2010 – May 2011.

Region	Site Visits												
	2010						2011						
	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Total
Horry County	5	2	4	4	7	9	21	12	10	14	5	16	**109**
Georgetown County	3	13	14	8	11	15	39	76	88	63	39	42	**411**
Upper Charleston County	17	20	21	15	14	12	30	17	30	41	37	27	**281**
Lower Charleston County	16	31	25	11	21	28	43	48	44	47	37	40	**391**
Beaufort and Jasper	17	35	13	41	44	40	56	64	78	53	55	60	**556**
Total	**58**	**101**	**77**	**79**	**97**	**104**	**189**	**217**	**250**	**218**	**173**	**185**	**1748**

Region	Interviews												
	2010						2011						
	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	Total
Horry County	42	15	29	50	38	14	1	1	6	25	8	27	**256**
Georgetown County	36	41	59	61	23	22	11	15	41	48	90	63	**510**
Upper Charleston County	33	49	41	46	39	14	11	8	17	18	40	46	**362**
Lower Charleston County	25	41	38	28	38	22	2	17	28	40	47	49	**375**
Beaufort and Jasper	18	34	12	91	68	16	16	18	29	27	49	41	**419**
Total	**154**	**180**	**179**	**276**	**206**	**88**	**41**	**59**	**121**	**158**	**234**	**226**	**1922**

Table 13. Disposition of fish caught by fishing parties interviewed by SFS staff during July 2010 – June 2011.

Disposition of Fish	Number of Fish Caught	Percent of Catch
Kept for bait	123	0.7
Kept for sale	1	0.0
Kept to eat	5832	34.3
Thrown Back (dead)	14	0.1
Thrown Back (illegal, over size limit)	238	1.4
Thrown Back (illegal, under size limit)	4074	24.0
Thrown Back (legal size)	6707	39.5
Total	**16989**	**100**

Table 14. Mean total length (TL; mm), and size range (mm) of top fifteen finfish measured by SFS staff during July 2010 – June 2011.

Scientific Name	Common Name	Number of Fish Measured	Mean TL (mm)	Size Range TL (mm)
Sciaenops ocellatus	Drum, Red	654	455	275 - 680
Paralichthys lethostigma	Flounder, Southern	631	410	233 - 642
Leiostomus xanthurus	Spot	515	216	154 - 303
Menticirrhus americanus	Kingfish, Southern	460	261	157 - 419
Cynoscion nebulosus	Seatrout, Spotted	305	405	247 - 596
Archosargus probatocephalus	Sheepshead	241	335	186 - 538
Micropogonias undulatus	Croaker, Atlantic	165	228	143 - 350
Pomatomus saltatrix	Bluefish	88	329	212 - 543
Centropristis striata	Seabass, Black	78	348	301 - 453
Scomberomorus maculatus	Mackerel, Spanish	72	403	283 - 682
Chaetodipterus faber	Spadefish, Atlantic	55	419	287 - 523
Bairdiella chrysoura	Perch, Silver	37	203	175 - 228
Pogonias cromis	Drum, Black	29	410	231 - 612
Trachinotus carolinus	Pompano, Florida	28	326	196 - 437
Scomberomorus cavalla	Mackerel, King	25	848	604 - 1067

Item 10. Charterboat Logbook Program

Since 1993, all fishermen with for-hire licenses have been required to submit monthly trip level logbook reports to MRD's Fisheries Statistics Section. These logbook reports allow staff to monitor the catch and effort of for-hire vessels in the state. Charter boat trip logs are coded and entered into a database. If trip logs are incomplete, staff contact charter vessel owners/captains to fill in data gaps to ensure accurate information. Annual summary reports are prepared and are available for resource management groups and the general public. This program provides 100% reporting of catch and effort from licensed six passenger or fewer charter boat operators in South Carolina. It can be used to supplement and verify the National Marine Fisheries Service's Marine Recreational Information Program's charter vessel data and has been provided for potential use in fishery stock assessments.

During this reporting period (July 1, 2010 – June 30, 2011) there were 496 licensed six passenger or fewer charterboat vessels in South Carolina. Trip level data are submitted by licensed vessel owners/operators on a monthly basis. June's charter data were not required to be submitted to the agency until July 10th, 2011 and those data were not successfully edited, entered and verified prior to this Annual Project Progress Report submission deadline. Since the available data are not representative of a complete fiscal year and in order to assess the yearly trends in SC recreational charter fishing, the following tables summarize the 2010 calendar year charterboat data (**Tables 15 and 16**).

Table 15. "Top 10 Species" caught, landed, and/or released during charter trips in 2010.

10 Most Caught Species	**10 Most Landed Species**	**10 Most Released Species**
Accounts for 78.9 % of all Species Caught	**Account for 80.7 % of all Species Landed**	**Accounts for 82.9 % of all Species Released**
Black Sea Bass (25.5 %)	Black Sea Bass (26.3 %)	Red Drum (26.1 %)
Red Drum (21.1 %)	Spanish Mackerel (15.3 %)	Black Sea Bass (25.3 %)
Spotted Seatrout (7.1 %)	Dolphin (11.3 %)	Spotted Seatrout (8.6 %)
Atlantic Sharpnose Shark (6.4 %)	Red Drum (6.3 %)	Atlantic Sharpnose Shark (7.9 %)
Spanish Mackerel (5.2 %)	Vermilion Snapper (5.2 %)	Blacktip Shark (3.4 %)
Dolphin (3.3 %)	Whiting (3.9 %)	Bonnethead Shark (2.9 %)
Bluefish (2.7 %)	Flounder, unclassified (3.7 %)	Bluefish (2.8 %)
Blacktip Shark (2.6 %)	King Mackerel (3.5 %)	Flounder (Unclassified) (2.2 %)
Flounder, unclassified (2.6 %)	Spotted Seatrout (2.7 %)	Ladyfish (1.9 %)
Vermilion Snapper (2.4 %)	Bluefish (2.5 %)	Spanish Mackerel (1.8 %)

Table 16. Charter boat percentage of effort by area fished in 2010, with overall comparisons of effort over the past three years.

Effort Totals				**2010 Area Effort (%)**		
Year	**2008**	**2009**	**2010**	**Estuarine**	**Inshore**	**Offshore**
Trips	9,051	9,215	10,500	52.4	23.5	24.0
Boat Hours	42,060	40,977	45,876	42.4	25.7	31.9
Anglers	31,720	31,342	36,341	50.6	20.9	28.5
Angler Hours	150,655	142,149	161,509	40.0	22.2	37.8

Appendix 1. Total catch of each species in the trammel net survey during Jul 1 2010 – Jun 30 2011.

Scientific name	Common name	Number caught	Rank
Sciaenops ocellatus	red drum	4104	1
Mugil cephalus	striped mullet	2865	2
Callinectes sapidus	blue crab	1918	3
Cynoscion nebulosus	spotted seatrout	1850	4
Leiostomus xanthurus	spot	1380	5
Malaclemys terrapin centrata	Diamondback terrapin	1076	6
Paralichthys lethostigma	southern flounder	766	7
Micropogonias undulatus	atlantic croaker	615	8
Lepisosteus osseus	longnose gar	411	9
Lagodon rhomboides	pinfish	238	10
Dasyatis sabina	atlantic stingray	184	11
Peprilus alepidotus	harvestfish	177	12
Sphyrna tiburo	bonnethead shark	175	13
Archosargus probatocephalus	sheepshead	132	14
Pomatomus saltatrix	bluefish	116	15
Elops saurus	ladyfish	115	16
Limulus polyphemus	horseshoe crab	108	17
Brevoortia tyrannus	menhaden	103	18
Rhizoprionodon terraenovae	atlantic sharpnose shark	98	19
Chilomycterus schoepfi	striped burrfish	91	20
Pogonias cromis	black drum	76	21
Rhinoptera bonasus	cownose ray	75	22
Menticirrhus americanus	southern whiting	72	23
Dasyatis sayi	bluntnose stingray	53	24
Orthopristis chrysoptera	pigfish	47	25
Dorosoma cepedianum	gizzard shad	23	26
Bairdiella chrysoura	silver perch	23	26
Ariopsis felis	sea catfish	21	28
Chelonia mydas	green seaturtle	21	28
Carcharhinus isodon	finetooth shark	20	30
Chloroscombrus chrysurus	atlantic bumper	17	31
Chaetodipterus faber	spadefish	17	31
Gymnura micrura	smooth butterfly ray	16	33
Trinectes maculatus	hogchoker	15	34
Sphoeroides maculatus	northern puffer	15	34
Trachinotus falcatus	permit	13	36
Paralichthys dentatus	summer flounder	12	37
Selene vomer	lookdown	8	38
Mugil curema	white mullet	8	38
Peprilus triacanthus	butterfish	8	38
Ancylopsetta quadrocellata	ocellated flounder	8	38
Negaprion brevirostris	lemon shark	5	42
Bagre marinus	gafftopsail catfish	5	42
Caranx hippos	jack crevalle	5	42
Megalops atlanticus	tarpon	5	42
Lobotes surinamensis	tripletail	4	46
Scomberomorus maculatus	spanish mackerel	4	46
Alosa aestivalis	blueback herring	3	48
Alosa sapidissima	american shad	3	48
Synodus foetens	lizardfish	3	48
Rachycentron canadum	cobia	3	48
Trachinotus carolinus	florida pompano	3	48
Prionotus tribulus	bighead searobin	3	48
Carcharhinus limbatus	blacktip shark	2	54
Strongylura marina	atlantic needlefish	2	54
Cynoscion regalis	weakfish	2	54
Carcharhinus acronotus	blacknose shark	1	57
Raja eglanteria	clearnose skate	1	57
Aetobatus narinari	spotted eagle ray	1	57
Ameiurus catus	white catfish	1	57
Opsanus tau	oyster toadfish	1	57
Syngnathus louisianae	chain pipefish	1	57
Centropomus undecimalis	snook	1	57
Morone americana	white perch	1	57
Morone saxatilis	striped bass	1	57
Mycteroperca microlepis	gag	1	57
Gobiosoma bosc	naked goby	1	57
Prionotus scitulus	leopard searobin	1	57
Citharichthys spilopterus	bay whiff	1	57
Etropus crossotus	fringed flounder	1	57
Ictalurus furcatus	blue catfish	1	57
		17,157	

Appendix 2. Total catch of each species in the electrofishing survey during Jul 1 2010 – Jun 30 2011.

Scientific name	Common name	Number caught	Rank
Mugil cephalus	striped mullet	11,783	1
Leiostomus xanthurus	spot	5,123	2
Brevoortia tyrannus	menhaden	4,116	3
Anchoa mitchilli	bay anchovy	963	4
Sciaenops ocellatus	red drum	852	5
Menidia beryllina	tidewater silverside	736	6
Lepomis macrochirus	bluegill	555	7
Micropterus salmoides	largemouth bass	534	8
Dorosoma cepedianum	gizzard shad	519	9
Anguilla rostrata	american eel	494	10
Ameiurus catus	white catfish	411	11
Fundulus heteroclitus	mummichog	384	12
Ictalurus furcatus	blue catfish	379	13
Lepisosteus osseus	longnose gar	360	14
Paralichthys lethostigma	southern flounder	314	15
Morone saxatilis	striped bass	246	16
Lepomis auritus	redbreast sunfish	222	17
Micropogonias undulatus	atlantic croaker	210	18
Mugil curema	white mullet	164	19
Bairdiella chrysoura	silver perch	161	20
Eucinostomus harengulus	tidewater mojarra	149	21
Lepomis microlophus	redear sunfish	144	22
Lagodon rhomboides	pinfish	121	23
Cynoscion nebulosus	spotted seatrout	106	24
Cyprinus carpio	carp	70	25
Trinectes maculatus	hogchoker	68	26
Amia calva	bowfin	68	26
Pomoxis nigromaculatus	black crappie	51	28
Gambusia affinis	mosquitofish	43	29
Labidesthes sicculus	brook silverside	38	30
Ictalurus punctatus	channel catfish	32	31
Alosa sapidissima	american shad	30	32
Gobionellus shufeldti	freshwater goby	29	33
Myrophis punctatus	speckled worm eel	21	34
Lepomis gibbosus	pumpkinseed sunfish	15	35
Minnow spp.	minnow spp.	15	35
Archosargus probatocephalus	sheepshead	14	37
Elops saurus	ladyfish	13	38
Menidia menidia	atlantic silverside	13	38
Lutjanus griseus	gray snapper	13	38
Morone americana	white perch	12	41
Dorosoma petenense	threadfin shad	12	41
Notemigonus crysoleucas	golden shiner	8	43
Strongylura marina	atlantic needlefish	7	44
Poecilia latipinna	sailfin molly	7	44
Pogonias cromis	black drum	7	44
Pylodictis olivaris	flathead catfish	7	44
Lepomis punctatus	spotted sunfish	6	48
Lucania parva	rainwater killifish	5	49
Esox americanus	redfin pickerel	5	49
Alosa aestivalis	blueback herring	4	51
Scomberomorus maculatus	spanish mackerel	4	51
Diapterus auratus	irish mojarra	4	51
Megalops atlanticus	tarpon	4	51
Lepomis gulosus	warmouth sunfish	3	55
Cynoscion regalis	weakfish	3	55
Pomatomus saltatrix	bluefish	2	57
Gobionellus hastatus	sharptail goby	2	57
Gobiosoma bosc	naked goby	2	57
Citharichthys spilopterus	bay whiff	2	57
Ctenopharyngodon idella	white amur	2	57
Lepomis cyanellus	green sunfish	2	57
Caranx hippos	jack crevalle	1	63
Symphurus plagiusa	blackcheek tonguefish	1	63
Syngnathus sp.	Syngnathus sp	1	63
Notropis hudsonius	spottail shiner	1	63
Callinectes sapidus	blue crab	1	63
Tilapia sp.	Tilapia species	1	63
		29,695	

Appendix 3. Total catch of each species in the 1/3rd mile longline survey during Jul 1 2010 – Jun 30 2011.

Scientific name	Common name	Number caught
RHIZOPRIONODON TERRAENOVAE	SHARK, ATLANTIC SHARPNOSE	577
SCIAENOPS OCELLATUS	RED DRUM	435
CARCHARHINUS PLUMBEUS	SHARK, SANDBAR	143
CARCHARHINUS ISODON	SHARK, FINETOOTH	117
CARCHARHINUS ACRONOTUS	SHARK, BLACKNOSE	75
CENTROPRISTIS STRIATA	SEA BASS, BLACK	55
CARCHARHINUS LIMBATUS	SHARK, BLACKTIP	51
DASYATIS AMERICANA	STINGRAY, SOUTHERN	31
SPHYRNA TIBURO	BONNETHEAD	29
CARCHARHINUS BREVIPINNA	SHARK, SPINNER	26
RAJA EGLANTERIA	SKATE, CLEARNOSE	26
BATRACHOIDIDAE	TOADFISHES	20
DASYATIS SAY	STINGRAY, BLUNTNOSE	20
DASYATIS SABINA	STINGRAY, ATLANTIC	12
GINGLYMOSTOMA CIRRATUM	SHARK, NURSE	12
SPHYRNA LEWINI	HAMMERHEAD, SCALLOPED	7
NEGAPRION BREVIROSTRIS	SHARK, LEMON	5
DASYATIS CENTROURA	STINGRAY, ROUGHTAIL	4
MUSTELUS CANIS	DOGFISH, SMOOTH	4
LIMULUS POLYPHEMUS	HORSESHOE CRAB	3
SERIOLA DUMERILI	AMBERJACK, GREATER	3
SPHYRAENA BARRACUDA	BARRACUDA, GREAT	3
CONGER OCEANICUS	AMERICAN CONGER	2
GALEOCERDO CUVIER	SHARK, TIGER	2
MENTICIRRHUS AMERICANUS	WHITING	2
CARCHARHINUS LEUCAS	SHARK, BULL	1
ELOPIDAE	TARPONS (TENPOUNDERS)	1
ELOPS SAURUS	LADYFISH	1
GYMNURA MICRURA	RAY, SMOOTH BUTTERFLY	1
OPHICHTHUS OPHIS	SNAKE EEL, SPOTTED	1
POMATOMUS SALTATRIX	BLUEFISH	1
RHINOPTERA BONASUS	RAY, COWNOSE	1
SYNODUS FOETENS	LIZARDFISH, INSHORE	1
Total		1,672

Appendix 4 .Total catch of each fish species in the Crustacean Management trawl survey during Jul 1 2010 – Jun 30 2011.

Scientific name	Common name	Number caught	Rank
Stellifer lanceolatus	star drum	8,493	1
Brevoortia tyrannus	menhaden	7,418	2
Urophycis regius	spotted hake	5,227	3
Anchoa mitchilli	bay anchovy	2,314	4
Micropogonias undulatus	atlantic croaker	1,422	5
Leiostomus xanthurus	spot	1,198	6
Symphurus plagiusa	blackcheek tonguefish	678	7
Cynoscion regalis	weakfish	564	8
Trinectes maculatus	hogchoker	292	9
Cynoscion nothus	silver seatrout	91	10
Alosa sapidissima	american shad	74	11
Menticirrhus americanus	southern whiting	74	11
Etropus crossotus	fringed flounder	74	11
Chloroscombrus chrysurus	atlantic bumper	73	14
Ancylopsetta quadrocellata	ocellated flounder	60	15
Dasyatis sabina	atlantic stingray	50	16
Prionotus tribulus	bighead searobin	50	16
Prionotus scitulus	leopard searobin	42	18
Bairdiella chrysoura	silver perch	36	19
Lolliguncula brevis	brief squid	29	20
Selene setapinnis	atlantic moonfish	20	21
Trichiurus lepturus	altantic cutlassfish	17	22
Paralichthys lethostigma	southern flounder	17	22
Anchoa hepsetus	striped anchovy	16	24
Mugil cephalus	striped mullet	15	25
Cynoscion nebulosus	spotted seatrout	14	26
Urophycis floridanus	southern hake	13	27
Selene vomer	lookdown	12	28
Peprilus alepidotus	harvestfish	11	29
Opsanus tau	oyster toadfish	10	30
Paralichthys dentatus	summer flounder	10	30
Gymnura micrura	smooth butterfly ray	9	32
Peprilus triacanthus	butterfish	9	32
Menidia menidia	atlantic silverside	8	34
Centropristis philadelphica	bank seabass	5	35
Scophthalmus aguosus	windowpane	5	35
Dasyatis sayi	bluntnose stingray	4	37
Alosa aestivalis	blueback herring	4	37
Sciaenops ocellatus	red drum	4	37
Prionotus evolans	striped searobin	4	37
Pomatomus saltatrix	bluefish	3	41
Chaetodipterus faber	spadefish	3	41
Dorosoma cepedianum	gizzard shad	2	43
Lagodon rhomboides	pinfish	2	43
Hypsoblennius hentzi	feather blenny	2	43
Aluterus schoepfii	orange filefish	2	43
Dorosoma petenense	threadfin shad	2	43
Raja eglanteria	clearnose skate	1	48
Rhinoptera bonasus	cownose ray	1	48
Opisthonema oglinum	atlantic thread herring	1	48
Bagre marinus	gafftopsail catfish	1	48
Menidia beryllina	tidewater silverside	1	48
Scomberomorus maculatus	spanish mackerel	1	48
Stephanolepis hispidus	planehead filefish	1	48
Sphoeroides maculatus	northern puffer	1	48
Ictalurus furcatus	blue catfish	1	48
	Total:	**28,491**	

Appendix 5. Total catch of each species by fishing parties interviewed during the SFS from July 2010 – June 2011.

Species Name	Number Caught	Percent Of Total	Species Name	Number Caught	Percent Of Total
Pinfish	2840	16.72%	Barracuda, Great	22	0.13%
Drum, Red	2804	16.50%	Triggerfish, Gray	22	0.13%
Spot	2046	12.04%	Rays, Dasyatidae	21	0.12%
Seabass, Black	1063	6.26%	Shark, Atlantic Sharpnose	20	0.12%
Flounder, *Paralichthidae*	1047	6.16%	Jack, Family	20	0.12%
Bluefish	755	4.44%	Skate, Clearnose	19	0.11%
Seatrout, Spotted	731	4.30%	Bass, Striped	17	0.10%
Kingfish, Southern	706	4.16%	Shark, Bonnethead	17	0.10%
Flounder, Southern	642	3.78%	Porgies	14	0.08%
Croaker, Atlantic	483	2.84%	Grouper, Gag	13	0.08%
Unidentified Shark	444	2.61%	Seabass, Genus	12	0.07%
Toadfish, Oyster	385	2.27%	Grouper, Scamp	8	0.05%
Sheepshead	363	2.14%	Snapper, Red	8	0.05%
Stingray	337	1.98%	Dolphin	7	0.04%
Kingfish	200	1.18%	Shark, Blacktip	7	0.04%
Perch, Silver	188	1.11%	Ribbonfish, Family	6	0.04%
Mackerel, Spanish	152	0.89%	Garfishes	5	0.03%
Lizardfish	123	0.72%	Unidentified Bottom Fish	5	0.03%
Spadefish, Atlantic	111	0.65%	Amberjack, Greater	5	0.03%
Drum, Black	107	0.63%	Skate	5	0.03%
Grunt Family	107	0.63%	Seabass, Bank	5	0.03%
Pigfish	103	0.61%	Seabass, Rock	5	0.03%
Pinfish, Spottail	74	0.44%	Porgy, Jolthead	5	0.03%
Eel, American	74	0.44%	Bonito, Atlantic	4	0.02%
Snapper, Vermilion	65	0.38%	Tarpon	4	0.02%
Puffer, Family	63	0.37%	Flounder, Summer	4	0.02%
Unidentified Fish	62	0.36%	Porgy, Knobbed	3	0.02%
Catfish, Blue	60	0.35%	Sailfish, Family	2	0.01%
Ladyfish	60	0.35%	Scup	2	0.01%
Searobin	55	0.32%	Shark, Lemon	2	0.01%
Puffer, Northern	52	0.31%	Tunny, Little	2	0.01%
Porgy, Red	44	0.26%	Butterfly Ray, *Gymnura spp*	1	0.01%
Cobia	43	0.25%	Wahoo	1	0.01%
Sea Catfish, Family	41	0.24%	Ray, Cownose	1	0.01%
Weakfish	41	0.24%	Catfish, Gafftopsail	1	0.01%
Shad	40	0.24%	Eel	1	0.01%
Mackerel, King	36	0.21%	Morey spp	1	0.01%
Porcupine Fish	31	0.18%	Menhaden, Family	1	0.01%
Pompano, Florida	29	0.17%	Hind, Speckled	1	0.01%
Grouper, unidentified	28	0.16%	Jack, Crevalle	1	0.01%
Catfish, Bullhead	26	0.15%	Lionfish, *Pterois volitans*	1	0.01%
Grunt, White	26	0.15%	Stargazer, Family	1	0.01%

Appendix 6. Total harvest of each species by fishing parties interviewed during the SFS from July 2010 – June 2011.

Species Common Name	Number Harvested	Percent Of Total	Species Common Name	Number Harvested	Percent Of Total
Spot	1951	32.76%	Grunt, White	20	0.34%
Kingfish, Southern	706	11.85%	Pinfish, Spottail	19	0.32%
Drum, Red	659	11.06%	Porgy, Red	19	0.32%
Flounder, Southern	632	10.61%	Weakfish	10	0.17%
Seatrout, Spotted	308	5.17%	Grouper, Scamp	8	0.13%
Sheepshead	274	4.60%	Shark, Bonnethead	7	0.12%
Croaker, Atlantic	248	4.16%	Shark, Atlantic Sharpnose	7	0.12%
Pinfish	155	2.60%	Dolphin	5	0.08%
Bluefish	111	1.86%	Jack, Family	5	0.08%
Seabass, Black	111	1.86%	Shark, Blacktip	5	0.08%
Perch, Silver	106	1.78%	Porgy, Jolthead	5	0.08%
Spadefish, Atlantic	87	1.46%	Grunt Family	4	0.07%
Mackerel, Spanish	76	1.28%	Flounder, Summer	4	0.07%
Kingfish	58	0.97%	Seabass, Bank	4	0.07%
Catfish, Blue	57	0.96%	Toadfish, Oyster	4	0.07%
Pigfish	40	0.67%	Grouper, Gag	3	0.05%
Snapper, Vermilion	39	0.65%	Porgy, Knobbed	3	0.05%
Mackerel, King	30	0.50%	Ladyfish	2	0.03%
Drum, Black	29	0.49%	Eel, American	1	0.02%
Pompano, Florida	28	0.47%	Wahoo	1	0.02%
Catfish, Bullhead	26	0.44%	Tunny, Little	1	0.02%
Cobia	23	0.39%	Hind, Speckled	1	0.02%
Triggerfish, Gray	21	0.35%	Tarpon	1	0.02%
Flounder, *Paralichthidae*	21	0.35%	Stingray	1	0.02%
Shad	20	0.34%			

SALTWATER RECREATIONAL FISHERIES LICENSE PROGRAM
FY2011 ANNUAL REPORT

Program Title: MARINE OUTREACH & EDUCATION PROGRAM

Primary Investigator: Robert Wiggers

Reporting Period: July 1, 2010 - June 30, 2011

Program Objectives:

- The Educational Vessel Discovery will be utilized as an educational tool from which to teach students, teachers and general public audiences about the complexity and importance of marine resources in coastal South Carolina.
- The Marine Recreational Angler Conservation and Education initiative will promote marine resource stewardship through representation at major boat shows, expos, and public presentations.
- Information will be disseminated through printed material, as well as signs, posters and educational videos, and made accessible to constituents in all regions of South Carolina.
- The public recreational tagging program will be used as a tool for communicating with recreational anglers and providing a volunteer opportunity that supports the collection of marine fisheries data.

Summary of Activities / Accomplishments to Date:

- Through the Carolina Coastal Discovery Marine Education program, staff completed 79 vessel based education programs (Figure 1) and 29 land based programs to students and teachers from grades K-12.

Figure 1. Education program onboard the E/V *Discovery*.

- Outreach staff represented the Marine Resources Division at three multi-day shows/expos including the Charleston Boat Show (Figure 2), the Southeast Wildlife Expo and the Palmetto Sportsman's Classic. Attendance at these events ranged from 2,000 – 15,000 attendees.

Figure 2. DNR booth at 2011 Charleston Boat Show.

- Public information material was distributed through the Coastal Information Distribution System (CIDS). Twenty two days were spent delivering approximately 232,000 copies of printed material to 110 vendors located throughout the coastal counties of South Carolina. Materials included rules and regulations books, tide tables, fish rulers, fish identification charts, and regulation update cards.

- Thirty seven aluminum signs noting the shore-based saltwater recreational license requirement (Figure 3) were placed at access sites throughout the coastal counties of South Carolina.

Figure 3. Shore-based license requirement sign placed at boat landing.

- A public awareness campaign was initiated encouraging anglers to release spotted seatrout following a severe cold kill. Fifty five posters with the phrase, “Let em’ spawn, let em’ live”, were posted at boat landings, public piers, and retail stores throughout all coastal counties (Figure 4).

Figure 4. Spotted seatrout public awareness campaign poster.

- Five public education videos were completed including fish measuring, tag and release, use of circle hooks and the effects of cold water temperature on white shrimp and spotted seatrout. These videos were made available through the SCDNR website. Visit http://saltwaterfishing.sc.gov/galleries.html to view these videos.

- Through the public recreational tagging program, a small contingent of taggers continues to tag and release target species. Forty two (42) additional tag kits were supplied during the reporting period, and anglers tagged 495 fish, of which 70% were red drum. During the reporting period, 84 (recreationally) tagged fish were reported and numerous recaptures of fish tagged through the Inshore Fisheries Section were processed and forwarded to appropriate staff. Three tag and release presentations were given to constituents, and 1 tag and release workshop was conducted for students in the Wando High School Fishing club.

- A logbook project associated with the public tagging program provides anglers with another opportunity to volunteer by recording information about their fishing activity. Eleven anglers participated in this project by documenting 98 trips and recording 798 measurements from target species including red drum, spotted seatrout, flounder and sheepshead.

- General public outreach occurs on a daily basis through response to public inquiries. Staff responded to over 300 requests for information. To facilitate the dissemination of information, the Saltwater Recreational License Program website is routinely updated to include informational videos and answers to frequently asked questions related to the use of marine resources and associated licensing requirements.

SALTWATER RECREATIONAL FISHERIES LICENSE PROGRAM
FY2011 ANNUAL REPORT

Program Title: **MARINE FISHERIES HABITAT ENHANCEMENT & MANAGEMENT AND RECREATIONAL SHORE-BASED ANGLER FISHERIES ACCESS IMPROVEMENT**

Primary Investigator: Robert M. Martore

Reporting Period: July 1, 2010 - June 30, 2011

Program Objectives:

1. Construction and maintenance of marine artificial reefs

Artificial reef development will continue on existing permitted reef sites along the South Carolina coast through the completion of reef construction activities in accordance with the State's Marine Artificial Reef Management Plan. The system of private aids to navigation on reef sites also continues to be maintained by following a schedule of routine inspection, maintenance and replacement on all applicable artificial reef sites. Performance and compliance monitoring, as required by reef permits, continues to follow a schedule of routine and special underwater inspections to document the stability, structural integrity and biological effectiveness of the materials in place on each of the State's artificial reef sites.

2. Community-based oyster restoration program

SCDNR's community-based oyster restoration project (SCORE) augments our workforce by engaging community volunteers to participate in hands-on restoration activities. Volunteers recycle oyster shell, bag oyster shell, build oyster reefs, and monitor water quality. Since 2000, this program has involved more than 9,500 citizens in resource stewardship activities, creating more than an acre of habitat at 35 different sites along the coast. These small-scale oyster reefs are used as research platforms for evaluating restoration techniques and monitoring methods and serve as living classrooms for educational field trips. This project is primarily supported with outside grants but utilizes shell from the License funding shell recycling program. This visible outreach program empowers coastal residents to participate in active stewardship and become environmental advocates.

3. Recreational Shore-based Angler Fisheries Access Improvement

In order to provide improved and additional areas for anglers to participate in recreational fishing into saltwater from shore based facilities SCDNR will partner with local counties, municipalities, and other interested entities to construct or enhance structures such as fishing piers and docks or assist in the enhancement of supporting facilities such as parking lots.

Summary of Activities / Accomplishments to Date:

1. *Construction and maintenance of marine artificial reefs*

Fifteen reef construction projects were carried out during this reporting period on 13 separate artificial reef sites. They are summarized below:

Date	Material	Reef Site
08 July 10	96 concrete culvert pipes	North Inlet Reef
27 July 10	14 concrete culvert pipes	Lowcountry Anglers Reef
31 Aug 10	40-foot barge	Jim Caudle Reef (Little River)
08 Sep 10	75 concrete filled steel drums	Capers Reef (R8)
09 Sep 10	85 concrete culvert pipes	CCA-McClellanvile Reef
17 Oct 10	50-foot deck barge	Georgetown Reef
25 Oct 10	6 Eternal Reef Balls	Charleston Nearshore Reef
27 Nov 10	90 concrete culvert pipes	C.J. Davidson Reef
19 Apr 11	50 concrete Reef Balls	Charleston 60' Reef
19 May 11	50 concrete Reef Balls	Charleston 60' Reef
01 June 11	3 juvenile habitat modules	Edisto 60' Reef
02 June 11	90 concrete culvert pipes	Pawleys Island Reef
02 June 11	50-foot deck barge	Ten Mile Reef
08 June 11	12 armored personnel carriers	Capers Reef
30 June 11	95' tugboat	Little River Offshore Reef

- Twenty-four days of estuarine and offshore reef monitoring were completed.
- Twenty-seven scuba dives were made to conduct video surveys and document colonization of reef structures.
- Eight missing reef buoys were replaced on offshore and inshore reef sites.
- Major media events were associated with this year's Reef-Ex event, including local print and television.
- Numerous presentations concerning the Reef Program were given to various fishing clubs, diving clubs, educational groups, and civic organizations around the state.

2. *Community-based oyster restoration program*

In 2010/11, the SCORE program worked with approximately 1,700 volunteers to create reef building blocks made from recycled shells placed in mesh bags and deploy these bags on shorelines to create oyster reefs. More than 6,200 bags were filled deployed in four coastal counties.

SCORE projects were funded primarily by external grants but did utilize shell from the License-supported recycling program. Additionally, the SCORE program enlists volunteers to recycle shells from restaurants. One dedicated group in Bluffton has been recycling shells from area restaurants since 2001.

This year, two new outreach programs were initiated under the SCORE program. One works with dock owners to collect oyster spat from their docks which can later be used to jump-start DNR-constructed oyster reefs. The pilot project was conducted in the Bohicket Creek/North Edisto region and involved 47 property owners and more than 400 additional community volunteers. To date, this program has been funded entirely with extramural grants but does use recycled shells. The future of this program will depend on the availability of funding.

We also partnered with SC Sea Grant Consortium and Clemson Marine Extension to initiate a pilot project to involve schools in growing and planting *Spartina* saltmarsh. This can be used to accelerate saltmarsh re-establishment behind restored oyster reefs. Seven schools participated in the pilot program, with more than 400 children involved.

The SCORE program also sponsors a community water monitoring program. This year more than 250 volunteers (approximately half scout troops) participated in monitoring water quality at 35 sites. This program partners with the Patriots Point, Hunting Island State Park, Huntington Beach State Park, the Town of Bluffton and the Ashley Cooper Stormwater Education Consortium (managed by Clemson Extension Service) to share data and resources. At the present time SRFAC is not funding this project directly but as external resources dwindle License funds may be required to continue this popular program.

3. *Recreational Shore-based Angler Fisheries Access Improvement*

A Memorandum of Agreement has been signed with Jasper County to provide $100,000 for the construction of a fishing pier at the Jasper-Knowles Island County Park on the Broad River. Plans and permits are in hand and construction of a roadway and parking area leading to the pier are currently underway. As soon as the roadway is completed, construction of the pier itself will begin.

SALTWATER RECREATIONAL FISHERIES LICENSE PROGRAM
FY2011 ANNUAL REPORT

Program Title: **OYSTER RESOURCE MANAGEMENT: SHELL RECYCLING, SHELL PLANTING, MONITORING, AND ASSESSMENT**

Primary Investigators: Nancy Hadley, Ben Dyar and Peter Kingsley-Smith

Reporting Period: July 1, 2010 - June 30, 2011

Program Objectives:

- Maintain shellfish resources for recreational harvesting on public and state shellfish grounds through large-scale shell and oyster seed planting operations.
- Provide habitat for finfish, invertebrates and other marine species dependent on oyster reef structure for critical inshore shelter.
- Recycle oyster shells and ensure they are quarantined prior to planting. Establish new drop-off sites at convenient locations and promote public participation in DNR's shell recycling program. Develop partnerships with NGOs, caterers and private companies to expand shell recycling.
- Monitor and assess oyster resources to assure sustainable management of oyster reefs for recreational harvest.
- Delineate state and public shellfish grounds and distribute maps to the public.
- Continue updating shellfish resource maps using recently acquired high resolution imagery; collect additional imagery; and ground-truth selected imagery.

Summary of Activities/Accomplishments to Date:

- During the 2010-2011 shellfish season (October-April), a record total of **22,901** bushels of shell was recycled (Figure 1). Twenty-one public drop-off sites were maintained. Recycled shell collected from these public coastal drop-off facilities, individual oyster roasts, oyster roast caterers and local restaurants resulted in a savings of over **$45,802** by not having to purchase an equivalent quantity of Gulf Coast and whelk shells for planting activites (Figure 2 and Figure 3).

- The increase in recycled shell is attributed largely to greater public awareness. Partner groups (e.g. Coastal Conservation Association and The Nature Conservancy) have assisted in spreading the word and DNR has been successful in getting press coverage.

- Shell drop-off sites are increasing each year in the coastal counties and strong relationships have been developed with oyster roast caterers, local restaurants and environmental organizations. Although our public bins continue to produce the most shell, these new relationships with local businesses, like that with all nine of the Gilligan's Restaurants in South Carolina, are proving very lucrative in the way of shell and publicity not only for the program and the benefits of shell recycling but for local businesses as well. We are seeing a very positive impact that the Oyster Shell Recycling and Planting Program is having not only on our natural resources but in the local community as well.

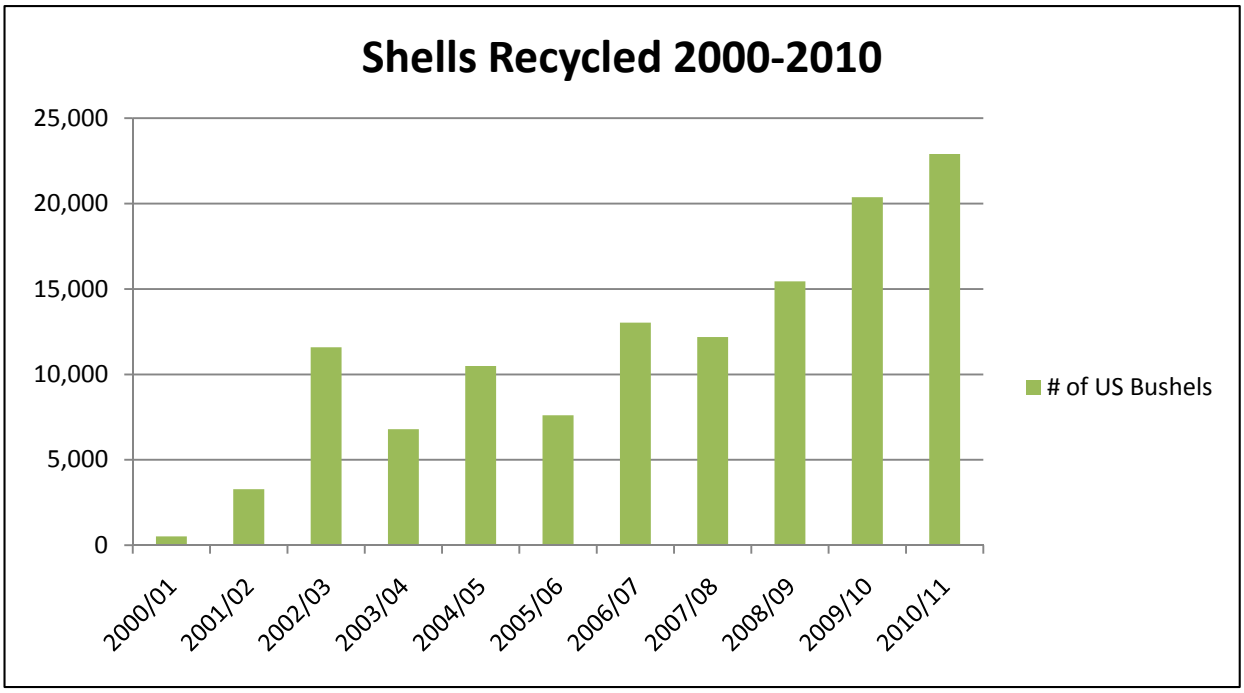


Figure 1. Since its genesis in 2000, nearly 125,000 bushels of oyster shells have been recycled through the contributions of individual consumers, local volunteers, commercial oyster roast caterers, and local restaurants. Increasing contributions reflect both an expanded program and increased public awareness.

Figure 2. Hydraulic dump trailers are utilized as semi-permanent drop-off sites in some areas as well as for large oyster roasts. Dump trailers allow SCDNR's recycling program to be more publicly accessible.

Figure 3. SCDNR has received positive feedback from local officials and the public for utilizing concrete barriers to create oyster shell recycling bins, due to their ease of maintenance.

Figure 4. A single planted shell attracts many juvenile oysters.

- Investments in oyster shell planting are returning a three dimensional standing crop yield, many times greater than the volume of shell planted. Most single planted shells are found with several juvenile oysters attached, illustrating the multiple returns on volume of shells planted (Figure 4). Many recreational oyster gatherers have commented to the media and SCDNR biologists about the positive impact shell planting is having on oyster resources in their area.

- A total of **36,282** bushels of oyster shells were planted on State and Public Shellfish Grounds between July 1, 2010 and June 30, 2011.
    - Georgetown County
        - Woodland Cut SSG (S-358) (two sites) –**10,392 bushels**
    - Charleston County
        - Kiawah River SSG (S-194) – **10,320 bushels** (Figure 5)
    - Beaufort County
        - May River PSG (R-008) (two sites) – **8,490 bushels**
        - Bull Creek PSG (R-008) (three sites) - **3,376 bushels**
        - Bull Creek Cut SSG (S-007) (two sites) – **3,704 bushels**
        - Beaufort County Total – **15,570** bushels

Figure 5. Shell being planted in Kiawah River in Charleston County.

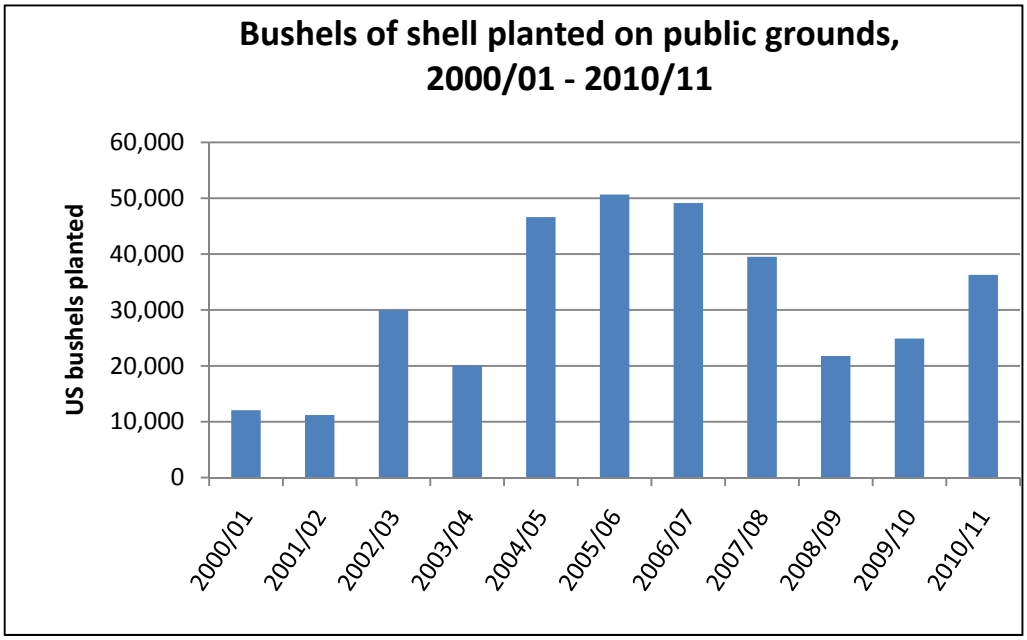


Figure 6. Bushels of shell planted on public shellfish grounds from 2000/01 – 2010/11.

- Staff examined a number of state shellfish grounds (SSGs) with the goal of developing more quantitative methods for assessing the grounds. Preliminary study of experimental techniques proved to be inadequate given current funding and personnel restrictions. However, staff are continuing to work on a various assessment plans for areas that are relatively inaccessible, including extensive flats and tidal creeks. New techniques include using photographs collected by helicopter to aid in mapping these oyster resources In May 2011, flights were completed over Kiawah West (S194W) and Leadenwah Creek (S181) as part of this ongoing assessment. In addition to these efforts to develop cost-effective assessment methods to improve resource management, we routinely monitor the status of shellfish grounds which were planted in recent years to evaluate the effectiveness of the shell planting program and to assess the need for additional maintenance planning. These evaluations also provide information on harvest pressure and resource recovery and allow SCDNR to better manage the public grounds.

- In addition to acquiring new helicopter imagery, we are organizing our large inventory of helicopter photos dating from 2006 – 2010 and using these to update our maps of the state's oyster resources. We have completed a review of the 2006 helicopter photos that include portions of Awendaw and Bulls Bay, and are halfway through the 2007 photos. The Sheldon area was completed and that included photos from 2008. The map of our state's oyster resources has also been fully checked for obvious errors using resources such as the helicopter photos, Agency knowledge of the resource, and free online low altitude imagery from Bing Maps (when available at low tide). This finalized layer has mapped the location of just under 5,000 acres of oyster in the state, and it will be considered our new "basemap" to replace the old maps used from the 1980s. This new map is still considered an underestimate of the resource because many reefs were not clearly visible on the imagery used to create the map, therefore it will continue to be updated periodically as new information is acquired and as we continue to review our helicopter photographs. With SRFAC funds we have also purchased a new mapping grade GPS (Trimble GeoXT) to be used for monitoring and mapping activities. This replaces one of our old GPS units. The software on the old units could not be upgraded and no longer functioned properly with the newer GPS/GIS software packages that are used to process the GPS data.

- In addition to these efforts to develop cost-effective assessment methods to improve resource management, we routinely monitor the status of shellfish grounds which were planted in recent years to evaluate the effectiveness of the shell planting program and to assess the need for additional maintenance planning. These evaluations also provide information on harvest pressure and resource recovery and allow SCDNR to better manage the public grounds.

- This year the maps of the state's oyster grounds were standardized and updated, allowing future edits to be implemented efficiently. In 2011-12, we plan to further update shellfish maps and increase their utility to the public by using recent (2009) aerial imagery as a background rather than the USGS topographic maps that have been used in the past. Due to the rapidly changing shoreline in certain areas these maps should be more useful to the public and will be more representative of the actual conditions on the ground. Shellfish ground maps were made available to the public both via internet access and in hard copy upon request. This change from topographic maps to imagery-based maps is time-consuming as features such as rivers and landmarks must be labeled manually. Thus our implementation date may need to be revised.

- 53 new boundary signs were put out on public and state shellfish grounds within the Charleston County are this year. Currently we are collecting GPS points for all new signs as well as existing signs in order to create a GIS map of all the collective shellfish boundary signs in the state. A new shellfish boundary sign database was created as well.

- Shellfish ground maps were made available to the public both via internet access and in hard copy upon request.

- This year we continued to acquire low-altitude high-resolution imagery and on-the-ground data to improve our shellfish resource database. Imagery from the McClellanville and North Island USGS quadrangles was acquired this year, although additional time will be needed to incorporate the information into the ArcGIS database. Shellfish resource imagery is now available online at SCDNR's data clearinghouse and is updated as new imagery or ground-truthing information is acquired.

SALTWATER RECREATIONAL FISHERIES LICENSE PROGRAM
FY2011 ANNUAL REPORT

Program Title: **RECREATIONAL CRUSTACEAN MONITORING**

Primary Investigator: Larry DeLancey

Reporting Period: July 1, 2010 - June 30, 2011

Program Objectives:

1. Large trawl survey: monitor sub-adult and adult white and brown shrimp populations and blue crab populations in estuarine rivers and sounds.
2. Small trawl survey: monitor juvenile shrimp populations and blue crab populations in tidal creeks.
3. Blue crab trap sampling: monitor the relative abundance of blue crabs.

Summary of Activities / Accomplishments to Date:

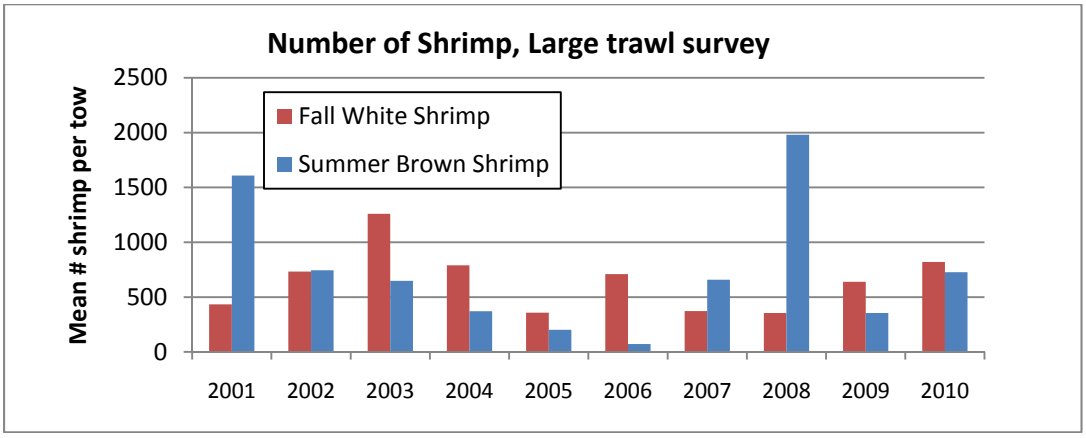
1. Large trawl survey

   20-foot trawl surveys were conducted each month in Charleston Harbor. Statewide sampling was conducted in estuarine waters from Charleston to Hilton Head Island in August and December of 2010, and in February and March-April, 2011. Numbers per tow of both white and brown shrimp were good in summer and fall, 2010, along the coast, enhanced by timely rainfall, which is thought to boost production and growth of shrimp. Both species should have been available for cast netting and seining. By early December, plunging temperatures concentrated white shrimp near the ocean and began to kill shrimp in the rivers, as water temperature readings taken during trawl sampling revealed lethal levels (below 47°F). By early January 2011, only a few live white shrimp were collected, and disappeared by late January. 50 subsequent trawl samples taken through June failed to collect any white shrimp. Based on these observations, waters off the coast of South Carolina out to 25 miles were closed to trawling by the Federal government at SCDNR 's request. This was done to protect the few remaining white shrimp spawners. Samples collected on large shrimp trawlers in late spring indicated that spawning was occurring, albeit at a lower than normal level.

   In May and June 2011, brown shrimp were caught in DNR trawls in increasing abundance and size appropriate for harvest.

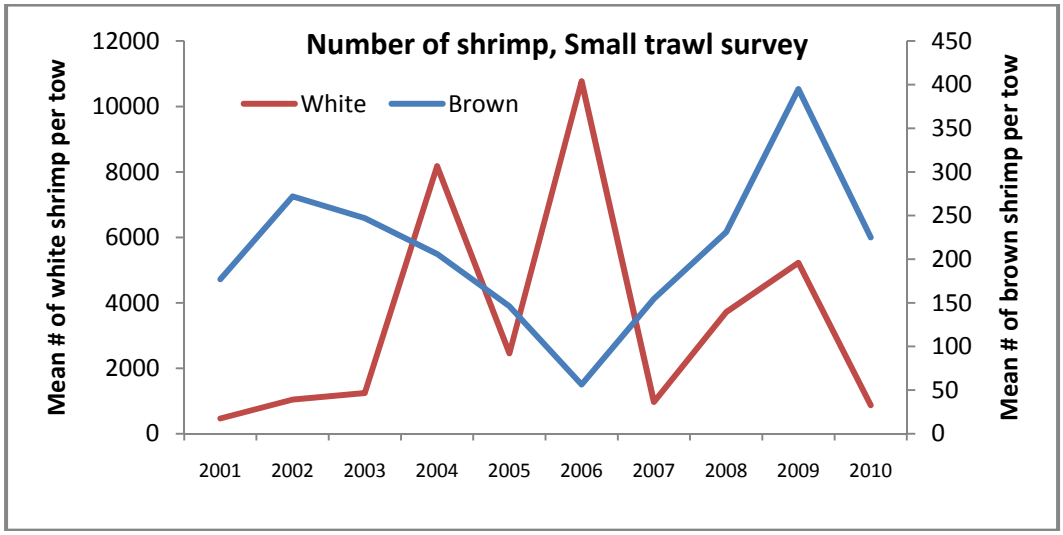
   Blue crabs are also collected in these trawls, and comparisons with numbers taken over the past decade continued to show poor catches until late spring. Blue crab often move beyond areas where SCDNR routinely samples. Charleston Harbor is a major staging area for female crab moving toward the ocean to release their eggs; near average amounts of mature female blue crab were collected in May and June 2011.

Information collected in this survey is distributed to SCDNR fisheries managers and scientists, and to the public through newspapers, press releases, radio shows, TV reports, and the SCDNR website.



2. Small trawl Survey

10-foot small-mesh trawls were conducted in tidal creeks from May through August near Charleston. Samples taken in 2010 collected near average numbers of both brown and white shrimp. Many of these were observed in areas well up the Wando River (several miles past the Highway 41 Bridge). This is typical of recent decades, because of increasing salt content of the water due to drought, among other factors. In spring 2011, brown shrimp were caught sporadically, and in upland areas. June collections included a few above-average catches of small white shrimp, the product of protected offshore spawning. Brown shrimp in creeks are usually available for harvest in June, while white shrimp can be caught by late July.



Blue crab are also an important species captured in creek trawls. Numbers seen in recent years have been lower than the peak in the mid 1990s. 2010 catches were about half the long term average (5 crabs per tow). Results from this study are considered when evaluating the status of the shrimp and crab populations in South Carolina.

3. **Blue crab trap sampling**

Seasonal sampling is conducted with standard wire crab traps soaked from 4 to 6 hours to provide an index of abundance for blue crab. Traps set in the summer in the Ashley River near Charleston can provide an estimate of the fall recreational harvest. Catches have been relatively stable in recent years, with 2010 numbers a little below average (1.9 legal crabs per trap). Data from trapping in fall along the coast reveal that the crab populations are in fair condition.