

Saltwater Recreational Fisheries License Program

Annual Project Summaries

Projects:

1. Fish Stock Enhancement Research: Evaluating A Responsible Approach to Marine Finfish Stock Enhancement of Red Drum, Cobia and Striped Bass
2. Inshore Finfish Monitoring & Research
3. Marine Finfish Habitat Management
4. Marine Outreach and Education Program
5. Oyster Resource Management: Shell Recycling, Shell Planting, Monitoring and Assessment

**SALTWATER RECREATIONAL FISHERIES LICENSE PROGRAM
ANNUAL PROJECT SUMMARIES**

Project Title: Fish Stock Enhancement Research: Evaluating A Responsible Approach to Marine Finfish Stock Enhancement of Red Drum, Cobia and Striped Bass.

Project PI/ Participants: M. Denson (PI), T. Darden (PI), K. Brenkert, A. Stokes, B. McAbee, M. Walker

Project Duration: July 1, 2009 through June 30, 2010

Project Objectives:

- Red drum carrying capacity and recruitment limitation research program:
 - Produce and stock 500,000 small juveniles (22 mm TL) in Cherry Grove, Ashley River and North Edisto to complement SG funded project goals of evaluating contribution of three stocking size classes within multiple estuaries (North Edisto stockings in collaboration with BBNFH).
- Striped bass restoration and habitat evaluation in the Ashley River:
 - Produce and stock 20,000 phase I juveniles (25 mm TL) and 5,000 phase II juveniles (125 mm TL) of the 2009 YC to continue our ongoing evaluation in the Ashley River (in collaboration with OGBNFH).
 - Produce and stock 20,000 phase I juveniles of the 2010 YC in headwaters of the Ashley River to complement our SK funded project’s phase I and Phase II stockings in the downstream areas of the Ashley River.
- Cobia ecology and life history research program in Port Royal Sound:
 - Produce and stock 500 large juveniles (250 mm TL) and 100 yearlings (500 mm TL).
 - Conduct plankton sampling to characterize spawning activity.
 - Coordinate field sample collection through tournaments, cooperating anglers and directed fishing efforts for life history evaluation.
- Use genetic markers for genetic broodstock management and continue our assessment of the contribution of past stocking experiments for all three species.

Summary of Activities:

- Red Drum:
 - During the fall of 2009, 1,562,456 small juvenile (28-35 mm TL) red drum were stocked into selected SC estuaries (Table 1). From this total, 461,159 were released in the North Edisto River, 471,373 in the Colleton River and 629,924 in the Ashley River.

Table 1. 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	Mean TL (mm)	Estuary
2009	461,159	28.4	North Edisto
2009	471,373	44.9	Colleton River
2009	629,924	35.7	Ashley River

- The genetics lab has processed a total of 1993 red drum samples with SRFAC funds since last July. We have completed the analysis of the 2007 year class North Edisto, Winyah Bay, Murrells Inlet and Little River samples, 2008 year class Ashley River, Murrells Inlet, Winyah Bay and Cherry Grove samples as well as the 2009 and 2010 broodstock (Table 2). Collections have just been completed for the 2008 year class in the North Edisto and will be processed and analyzed shortly.

Table 2. Red drum contribution summary from past stockings for which SRFAC funds were used to process and analyze field collected samples.

Year Class	Estuary	Stocking Treatment	Treatment Contribution (%)	Overall Contribution (%)
2007	North Edisto	Small	21.0	21.0
2007	Winyah Bay	Small	13.7	14.7
		Medium	1.0	
2007	Murrells Inlet	Small	7.5	9.0
		Medium	1.5	
2007	Little River	Small	9.3	9.3
		Medium	0	
2008	Winyah Bay	Small	12.9	16.5
		Medium	3.6	
2008	Murrells Inlet	Small	2.6	21.8
		Medium	19.2	
2008	Cherry Grove	Small	13.4	14.6
		Medium	1.2	
2008	Ashley River	Larvae	0.4	29.9
		Small	0	
		Medium	29.5	

- **Striped Bass:**

- For the 2009 Year Class, a total of 175,692 Phase I striped bass were stocked in the Ashley River (Table 3) with 93,481 fish released in the freshwater portion and 82,221 released in the brackish portion of the system. A total of 15,448 Phase II striped bass were stocked in the Ashley River with 10,448 released in the freshwater portion and 5,000 released in the brackish portion.
- For the 2010 Year Class, 24,050 Phase I striped bass (38 mm TL) were produced and stocked into the headwaters of the Ashley River (Shultz Lake) this past spring.

Table 3. Striped bass stocking summary of 2009 Year Class in the Ashley River. FW: freshwater, BW: brackish water.

Production Treatment		Stocking Location	Number Stocked	Mean Size at Stocking (TL(mm))
Phase I	FW Produced	FW	54,752	32.5
	FW Produced	BW	48,600	35.6
	BW Produced	FW	38,729	38.8
	BW Produced	BW	33,611	37.6
Phase II	FW Produced	FW	5,448	151.1
	FW Produced	BW	---	---
	BW Produced	FW	5,000	241.6
	BW Produced	BW	5,000	242.7

- The genetics lab processed the 2009 Year Class striped bass broodstock samples (n=298) 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 June through December 2009, with 100% contribution of the 2009 YC stocked fish with all release treatments represented.
- Cobia:
 - Two size classes of cobia were produced and stocked during the fall of 2009 (Table 4). From the 2009 Year Class, 1,392 large juveniles were released into the Port Royal Sound estuary and 54 yearlings from the 2008 Year Class were externally tagged and released at the same location.

Table 4. Cobia stocking summary from SRFAC funding including year class and average length at release.

Year Class	Number Stocked	Mean TL (mm)
2009	1,392	228
2008	54	533

- The genetics lab processed 328 cobia samples with SRFAC funds during the past year. We have completed the analysis of the 2009 field-collected samples as well as the 2009 and 2010 broodstock (Table 2). During their first potential year of recruitment to the collecting gear, the 2007 YC stocked fish made a 2.3% contribution to the entire population and ~50% contribution to the 2007 YC (estimates range from 33-66% depending on method of identifying year class). The 2010 field collections will allow for better evaluation of the 2007 YC as they will be fully recruited during that collection period.
- A total of 201 (2009 field-collected) samples from SC were processed for life history information such as length, weight and age. Additionally, 25 of the 48 plankton samples taken during the 2009 season have been sorted and cobia eggs and larvae have been identified in the samples suggesting they are spawning in Broad river.

- During spring 2010, approximately 220 field samples were collected for full analysis (length, weight, gonad histology, age, genetics) while an additional 35 samples were collected for length, weight and genetic analyses. Additionally, the third season of plankton sampling was completed, with a total of 50 plankton tows during 2010. Processing of these 2010 collected samples will begin this fall.

Project Title: INSHORE FINFISH MONITORING & RESEARCH

Primary Investigators: Michael Denson, Stephen Arnott, Julia Byrd, Brad Floyd.

Co-investigators: Erin Levesque, John Archambault, Bill Roumillat, W. Henry DaVega, Kris Reynolds, Lindsey Roberg, Vanessa Geddis, and Karen Rourk.

Reporting Period: July 1, 2009 – June 30, 2010.

Project Objectives:

- Item 1. Trammel net survey: Monitoring of higher salinity (>8 ppt) estuarine areas in SC.
- Item 2. Electrofishing survey: Monitoring of lower salinity (≤ 8 ppt) estuarine areas in SC.
- Item 3. Adult long-line survey: Monitoring of offshore areas of SC (outside the estuaries), especially of adult (spawning) red drum and coastal shark species.
- Item 4. Fish rack program: Measurements and biological samples from fish ‘racks’ (filleted carcasses) that anglers donate at conveniently located freezer locations.
- Item 5. Fish tournament program: Measurements and biological samples from fish caught at fishing tournaments.
- Item 6. Tagging program: Tag information from anglers that have caught a tagged fish.
- Item 7. State Finfish Survey (SFS): Information on statewide participation, catch and fishing effort.
- Item 8. Charterboat Logbook Program: Logbook information of catch and effort from vessels carrying fishermen on a for-hire basis (captains/owners required to submit these data by law).
- Item 9. Public survey of opinions of MRD and selected fisheries . Information on the opinions of SC saltwater recreational fishing license holders.

Summary of Activities / Accomplishments to Date:

- *Item 1. Trammel net survey: Monitoring of higher salinity (>8 ppt) estuarine areas in SC.*

During the reporting period (Jul 1, 2009 – Jun 30, 2010), a total of 982 trammel sets were made in nine survey strata along the SC coast (**Table 1**). The trammel survey included two new strata (the 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 17,897 specimens belonging to 65 species (**Appendix 1**). Length and weight measurements were taken from the majority of fish before releasing them alive at the site of capture. A total of 3,584 biological samples (e.g. otoliths, scales, fin clips, etc.) were collected from a proportion of the specimens caught (**Table 2**).

Table 1 Number of trammel sets made, per month, in each sampling stratum during Jul 2009 - Jun 30 2010.

Stratum	2009						2010						Total
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
ACE Basin	10	9	12	13	10	12	13	8	13	12	7	13	132
Lower Ashley River	13	10	14	13	15	14	12	14	13	12	14	12	156
Broad River		11		13			12			14			50
Charleston Harbor	10	7	10	10	11	11	12	12	10	10	10	8	121
Collecton River		14		12			13			14			53
Lower Wando River	11	11	11	9	11	12	11	11	12	11	10	9	129
Muddy/Bulls Bay	13	10	14		12	11	13	12	13		11	10	119
Cape Romain	11		13	12	14	14	9	13	12	8	12	10	128
Winyah Bay	12		12	6	12	13		10	10	12		7	94
Total	80	72	86	88	85	87	95	80	83	93	64	69	982

Table 2 Number of biological samples collected from specimens caught during Jul 2009 – Jun 2010, by survey type

Biological sample	Purpose	Trammel	Electro	Longline	Total
Fin clip	Genetics	2,009	1,122	51	3,182
Otoliths	Ageing	642	138	68	848
Scales	Ageing	468	-	-	468
Whole specimen	Parasite examination (CofC)	186	193	42	421
Gonads	Maturity and fecundity	155	77	59	291
Muscle fillet	Mercury analysis (DHEC)	86	3	19	108
Whole specimens	Various student/intern projects	12	76	-	88
Other	Various (samples for other institutes)	26	32		58
Blood/Fin/Muscle	Telomere ageing genetics project	-	-	51	51
Stomach	Stomach content analysis	-	-	3	3
		3,584	1,641	293	5,518

- *Item 2. Electrofishing survey: Monitoring of lower salinity (≤ 8 ppt) estuarine areas in SC.*

During the reporting period, a total of 401 electrofishing sets was made in six survey strata (areas) along the SC coast (Table 3). One new stratum (“Freshwater Ashley”) was added to the program as part of a Mariculture project examining stocked striped bass survival and distribution patterns.

The electrofishing survey caught a total of 37,230 specimens belonging to 74 species (**Appendix 2**). Length and weight measurements were taken from the majority of fish before releasing them alive at the site of capture. A total of 1,641 biological samples (e.g. otoliths, scales, fin clips, etc.) was collected from a proportion of the specimens caught (**Table 2**).

Table 3 Number of electrofishing sets made, per month, in each sampling stratum during Jul 2009 - Jun 2010.

Stratum	2009						2010						Total
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
Combahee River	5	6	6	6	5	6	5	6	5	6	6	7	69
Waccamaw River	4	5	3	3	5	6	5	4	5	5	7	6	58
Freshwater Ashley River	6	6	6	6	8	6	6	6	6	6	6	6	74
Lower Edisto River	6	5	6	6	6		5	6	6	6	5	6	63
Upper Ashley River	6	6	6	7	7	6	5		6	6	6	6	67
Upper Cooper River	6	6	6	5	6	4	6	6	6	6	7	6	70
Total:	33	34	33	33	37	28	32	28	34	35	37	37	401

- *Item 3. Adult long-line survey: Monitoring of offshore areas of SC (outside the estuaries), especially of adult (spawning) red drum and coastal shark species.*

During the reporting period, a total of 370 1/3rd-mile long-line sets were made in four survey strata along the SC coast (**Table 4**). These sets caught 1,715 specimens belonging to 26 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. A total of 69 red drum was sacrificed for ageing purposes (as requested by the Atlantic States Marine Fisheries Commission) and a total of 293 biological samples was collected for a variety of purposes (**Table 2**).

Table 4 Number of long-line sets made during Jul 2009 – Jun 2010.

Gear type	Stratum	Jul '09	Aug '09	Sep '09	Oct '09	Nov '09	May '10	Total
1/3rd mile longline	Charleston Harbor	-	30	-	30	27	-	87
	Port Royal Sound	28	-	-	30	28	20	106
	St Helena Sound	30	-	-	30	30	-	90
	Winyah Bay	-	30	-	30	27	-	87
	Total:	58	60	0	120	112	20	370

- *Item 4. Fish rack program: Measurements and biological samples from fish 'racks' (filleted carcasses) that anglers donate at conveniently located freezer locations.*

A total of 305 fish racks belonging to 5 species was acquired 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 genetic analysis.

Table 5 Number of fish acquired from the freezer and tournament monitoring programs.

Scientific name	Common name	Program		Total
		Freezer	Tournament	
<i>Archosargus probatocephalus</i>	sheepshead	172	123	295
<i>Cynoscion nebulosus</i>	spotted seatrout	14	199	213
<i>Paralichthys lethostigma</i>	southern flounder	38	86	124
<i>Sciaenops ocellatus</i>	red drum	78	30	108
<i>Pomatomus saltatrix</i>	bluefish	-	37	37
<i>Pogonias cromis</i>	black drum	3	22	25
<i>Rachycentron canadum</i>	cobia	-	2	2
<i>Cynoscion regalis</i>	weakfish	-	1	1
		305	500	805

- *Item 5. Fish tournament program: Measurements and biological samples from fish caught at fishing tournaments.*

During the reporting period, SCDNR Inshore Fisheries attended nine fishing tournaments, including four from Jul-Oct 2009 and five from Apr-Jun 2010. Measurements and biological samples were obtained from 500 fish belonging to 8 species, of which spotted seatrout was the most numerous, followed by sheepshead and southern flounder (Table 5).

- *Item 6. Tagging program: Tag information from anglers that have caught a tagged fish.*

During the reporting period, the trammel and electrofishing surveys tagged 3,237 fish belonging to four species, with the majority being red drum (Table 6). Over the same period, the surveys recaptured 329 fish and recreational anglers reported 551 recaptures (Table 7). Approximately 74% (407/551) of the angler recaptures were released alive.

Table 6 Number of fish tagged by the Trammel and Electrofishing surveys period Jul 2009 – Jun 2010.

Species	Electro	Trammel	Total
BLACK DRUM		105	105
RED DRUM	664	2,347	3,011
SHEEPSHEAD	4	109	113
TRIPLETAIL		8	8
Total	668	2,569	3,237

Table 7. For fish originally tagged by the Trammel and Electrofishing surveys, number and fate of recaptured fish during the period Jul 2009 – Jun 2010.

Species	Gear	ANGLER RECAPTURES			SURVEY RECAPTURES			Total
		Killed	Release d (w/ tag)	Release d (w/o tag)	Killed	Released (w/ tag)		
BLACK DRUM	Trammel survey					4	4	
	Hook & Line	18		7			25	
	Gig	1					1	
BLACK DRUM Total		19		7		4	30	
RED DRUM	Trammel survey				2	298	300	
	Electro survey					21	21	
	Longline survey				1		1	
	Hook & Line	120	31	367			518	
	Gig	1					1	
	Cast net	1					1	
	Hand picking	1			1	1	3	
	RED DRUM Total		123	31	368	4	319	845
SHEEPSHEAD	Trammel survey					2	2	
	Hook & Line	2		1			3	
SHEEPSHEAD Total		2		1		2	5	
Total		144	31	376	4	325	880	
				551		329	880	

- *Item 7. State Finfish Survey (SFS): Information on statewide participation, catch and fishing effort.*

During the reporting period (July 1, 2009 – May 31, 2010; June data are still being entered and proofed), 1,707 fishing parties were interviewed in private boat mode representing contact with 3,530 recreational fishermen. 94% of fishing parties interviewed fished in inshore waters, while 2% 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 8**). The top species targeted by fishing parties were red drum (*Sciaenops ocellatus*), spotted seatrout (*Cynoscion nebulosus*), flounder (*Paralichthys sp.*), and spot (*Leiostomus xanthurus*). Fishing parties interviewed caught a total of 19,720 fish belonging to 62 species (Appendix 4) of which 45% were harvested by anglers and kept for consumption (**Table 9**). Of those fish harvested (Appendix 5), 3,820 finfish were measured by SCDNR staff belonging to 47 species. Fifteen species accounted for 94% of all finfish measured (Table 10). Additionally in June 2010 SFS staff began collecting otoliths from a proportion of selected species (black drum, bluefish, Atlantic croaker, weakfish, sheepshead, and spot) to assist other MRD projects.

Table 8. Number of site visits and completed interviews by SFS staff, per month, in each coastal region during July 2009 – May 2010.

Region	Site Visits												Interviews											
	2009						2010						2009						2010					
	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Total
Horry	3	3	4	3	10	14	6	3	16	5	2	69	21	23	8	33	21	5	0	0	8	33	14	166
Georgetown	7	7	9	10	12	29	29	15	36	7	5	166	53	27	59	106	82	21	32	18	54	33	45	530
Upper Charleston County	9	21	14	20	13	16	15	19	22	22	13	184	24	59	43	53	19	7	8	19	28	42	39	341
Lower Charleston and Colleton Counties	19	16	29	19	24	31	30	29	29	25	24	275	43	36	46	33	28	26	14	17	28	27	48	346
Beaufort and Jasper Counties	48	35	43	24	25	37	28	47	29	33	24	373	44	36	42	32	29	34	19	13	24	29	22	324
Total	86	82	99	76	84	127	108	113	132	92	68	1067	185	181	198	257	179	93	73	67	142	164	168	1707

Table 9. Disposition of fish caught by fishing parties interviewed by SFS staff during July 2009 – May 2010.

Disposition of fish	Number of Fish Caught	Percent of Catch
Kept to eat	8,943	45.3
Kept for bait	79	0.4
Released (legal)	6,188	31.4
Released (illegal, under size limit)	4,271	21.7
Released (illegal, over size limit)	205	1.0
Released (dead)	34	0.2
Total	19,720	100

Table 10. Mean total length (TL; mm), and size range (mm) of top fifteen finfish measured by SFS staff during July 2009 – May 2010.

Scientific Name	Common Name	Number of Fish Measured	Mean TL (mm)	Size Range TL (mm)
<i>Leiostomus xanthurus</i>	Spot	676	233	180 - 323
<i>Cynoscion nebulosus</i>	Spotted Seatrout	589	413	335 - 584
<i>Sciaenops ocellatus</i>	Red Drum	570	465	294 - 590
<i>Paralichthys lethostigma</i>	Southern Flounder	530	412	280 - 614
<i>Menticirrhus americanus</i>	Southern Kingfish	347	282	135 - 404
<i>Archosargus probatocephalus</i>	Sheepshead	250	337	217 - 479
<i>Centropristis striata</i>	Black Seabass	196	361	295 - 452
<i>Micropogonias undulatus</i>	Atlantic Croaker	111	247	184 - 333
<i>Pomatomus saltatrix</i>	Bluefish	102	360	246 - 457
<i>Scomberomorus maculatus</i>	Spanish Mackerel	70	396	306 - 642
<i>Pogonias cromis</i>	Drum, Black	41	489	362 - 643
<i>Scomberomorus cavalla</i>	Mackerel, King	34	832	638 - 1020
<i>Chaetodipterus faber</i>	Atlantic Spadefish	33	364	277 - 440
<i>Rhomboplites aurorubens</i>	Vermillion Snapper	26	346	318 - 377
<i>Coryphaena hippurus</i>	Dolphin	25	751	553 - 1080

- *Item 8. Charterboat Logbook Program: Logbook information of catch and effort from vessels carrying fishermen on a for-hire basis (captains/owners required to submit these data by law).*

During this reporting period (July 1, 2009 – June 30, 2010) there were 486 licensed six-passenger or fewer charterboat operators in South Carolina. Trip level data are submitted by licensed

vessel owners/operators on a monthly basis. June's charter data was not required to be submitted to the agency until July 10th, 2010 and that data was 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 2009 calendar year charterboat data (**Tables 11 and 12**).

Table 11. "Top 10 Species" caught, landed, and/or released during charter trips in 2009.

10 Most Caught Species	10 Most Landed Species	10 Most Released Species
Accounts for 76.3% of all Species Caught	Account for 79.3% of all Species Landed	Accounts for 80.4% of all Species Released
Black Sea Bass	Spanish Mackerel	Red Drum
Red Drum	Dolphin	Black Sea Bass
Spotted Seatrout	Black Sea Bass	Spotted Seatrout
Spanish Mackerel	Vermilion Snapper	Atlantic Sharpnose Shark
Atlantic Sharpnose Shark	King Mackerel	Shark (Unclassified)
Dolphin	Spotted Seatrout	Blacktip Shark
Unclassified Shark	Red Drum	Bluefish
Vermilion Snapper	King Whiting	Flounder (Unclassified)
Bluefish	Bluefish	Ladyfish
Blacktip Shark	White Grunt	Vermilion Snapper

Table 12. Charter boat percentage of effort by area fished in 2009.

2009	Totals	Estuarine %	Inshore %	Offshore %
Trips	9,215	50.3	25.3	24.4
Boat Hours	40,977	48.1	22.4	29.4
Anglers	31,342	39.7	27.9	32.4
Angler Hours	142,149	36.9	24.1	39.0

- *Item 9. Public survey of opinions of MRD and selected fisheries. Information on the opinions of SC saltwater recreational fishing license holders.*

Changes were made to the saltwater recreational fishing license in July 2009, requiring individuals recreationally fishing from the shore and those recreationally shrimping and crabbing to have saltwater recreational fishing licenses for the first time. These license changes made shore-based anglers part of the known license holder population for the first time. During spring 2010, a telephone survey of saltwater recreational fishing license holders was designed in collaboration with Responsive Management, Inc. to help characterize saltwater recreational shore-based fishermen. The telephone survey was conducted by Responsive Management in May 2010. Participants were selected randomly from FY10 saltwater recreational license holders. 1,720 license holders participated in the survey. All respondents were asked questions about their saltwater fishing activities and their opinions of the Marine Resource Division and its activities. Respondents that indicated they saltwater fished from shore within the past 12 months were asked additional questions about their behaviors, opinions, and fishing activities. An executive summary of the survey results can be found in Appendix 6. A report with detailed survey results will be available upon request.

Appendix 1 Total catch of each species by the trammel net survey during Jul 1 2009 – Jun 30 2010.

Common name	Scientific name	Number caught	Rank
red drum	<i>Sciaenops ocellatus</i>	3,621	1
striped mullet	<i>Mugil cephalus</i>	2,735	2
spotted seatrout	<i>Cynoscion nebulosus</i>	2,726	3
spot	<i>Leiostomus xanthurus</i>	1,729	4
atlantic croaker	<i>Micropogonias undulatus</i>	1,171	5
blue crab	<i>Callinectes sapidus</i>	1,090	6
Diamondback terrapin	<i>Malaclemys terrapin centrata</i>	799	7
southern flounder	<i>Paralichthys lethostigma</i>	569	8
pinfish	<i>Lagodon rhomboides</i>	398	9
menhaden	<i>Brevoortia tyrannus</i>	359	10
atlantic sharpnose shark	<i>Rhizoprionodon terraenovae</i>	227	11
atlantic stingray	<i>Dasyatis sabina</i>	223	12
longnose gar	<i>Lepisosteus osseus</i>	216	13
bonnethead shark	<i>Sphyrna tiburo</i>	204	14
ladyfish	<i>Elops saurus</i>	197	15
harvestfish	<i>Peprilus alepidotus</i>	191	16
black drum	<i>Pogonias cromis</i>	189	17
sheepshead	<i>Archosargus probatocephalus</i>	132	18
southern whiting	<i>Menticirrhus americanus</i>	118	19
silver perch	<i>Bairdiella chrysoura</i>	111	20
bluefish	<i>Pomatomus saltatrix</i>	106	21
horseshoe crab	<i>Limulus polyphemus</i>	85	22
striped burrfish	<i>Chilomycterus schoepfi</i>	85	22
white mullet	<i>Mugil curema</i>	68	24
gizzard shad	<i>Dorosoma cepedianum</i>	65	25
bluntnose stingray	<i>Dasyatis sayi</i>	54	26
cownose ray	<i>Rhinoptera bonasus</i>	49	27
pigfish	<i>Orthopristis chrysoptera</i>	42	28
jack crevalle	<i>Caranx hippos</i>	40	29
atlantic bumper	<i>Chloroscombrus chrysurus</i>	32	30
spadefish	<i>Chaetodipterus faber</i>	30	31
northern puffer	<i>Sphoeroides maculatus</i>	29	32
green sea turtle	<i>Chelonia mydas</i>	27	33
sea catfish	<i>Arius felis</i>	25	34
hogchoker	<i>Trinectes maculatus</i>	22	35
finetooth shark	<i>Carcharhinus isodon</i>	17	36
lookdown	<i>Selene vomer</i>	15	37
smooth butterfly ray	<i>Gymnura micrura</i>	14	38
blacktip shark	<i>Carcharhinus limbatus</i>	13	39
lemon shark	<i>Negaprion brevirostris</i>	10	40
triple tail	<i>Lobotes surinamensis</i>	9	41
summer flounder	<i>Paralichthys dentatus</i>	8	42
butterfish	<i>Peprilus triacanthus</i>	5	43
permit	<i>Trachinotus falcatus</i>	5	43
atlantic needlefish	<i>Strongylura marina</i>	3	45
Atlantic ridley turtle	<i>Lepidochelys kempii</i>	3	45
blueback herring	<i>Alosa aestivalis</i>	3	45
gafftopsail catfish	<i>Bagre marinus</i>	3	45
lizardfish	<i>Synodus foetens</i>	3	45
spanish mackerel	<i>Scomberomorus maculatus</i>	3	45
spotted eagle ray	<i>Aetobatus narinari</i>	3	45
bay whiff	<i>Citharichthys spilopterus</i>	2	52
bighead searobin	<i>Prionotus tribulus</i>	2	52
blue catfish	<i>Ictalurus furcatus</i>	1	54
cobia	<i>Rachycentron canadum</i>	1	54
gulf flounder	<i>Paralichthys albigutta</i>	1	54
ocellated flounder	<i>Ancyloperca quadrocellata</i>	1	54
oyster toadfish	<i>Opsanus tau</i>	1	54
sandbar shark	<i>Carcharhinus plumbeus</i>	1	54
shortnose sturgeon	<i>Acipenser brevirostrum</i>	1	54
striped bass	<i>Morone saxatilis</i>	1	54
tarpon	<i>Megalops atlanticus</i>	1	54
weakfish	<i>Cynoscion regalis</i>	1	54
white catfish	<i>Ictalurus catus</i>	1	54
white shrimp	<i>Penaeus setiferus</i>	1	54
		17,897	

Appendix 2 Total catch of each species by the electrofishing survey during Jul 1 2009 – Jun 30 2010.

Common name	Scientific name	Number caught	Rank
striped mullet	<i>Mugil cephalus</i>	16,820	1
spot	<i>Leiostomus xanthurus</i>	6,381	2
tidewater silverside	<i>Menidia beryllina</i>	2,603	3
menhaden	<i>Brevoortia tyrannus</i>	2,396	4
mummichog	<i>Fundulus heteroclitus</i>	934	5
red drum	<i>Sciaenops ocellatus</i>	911	6
threadfin shad	<i>Dorosoma petenense</i>	647	7
bluegill	<i>Lepomis macrochirus</i>	643	8
american eel	<i>Anguilla rostrata</i>	589	9
largemouth bass	<i>Micropterus salmoides</i>	544	10
bay anchovy	<i>Anchoa mitchilli</i>	526	11
gizzard shad	<i>Dorosoma cepedianum</i>	488	12
silver perch	<i>Bairdiella chrysoura</i>	460	13
southern flounder	<i>Paralichthys lethostigma</i>	394	14
blue catfish	<i>Ictalurus furcatus</i>	371	15
longnose gar	<i>Lepisosteus osseus</i>	302	16
striped bass	<i>Morone saxatilis</i>	254	17
redeer sunfish	<i>Lepomis microlophus</i>	217	18
redbreast sunfish	<i>Lepomis auritus</i>	199	19
sheepshead minnow	<i>Cyprinodon variegatus</i>	169	20
spotted seatrout	<i>Cynoscion nebulosus</i>	152	21
atlantic croaker	<i>Micropogonias undulatus</i>	136	22
white mullet	<i>Mugil curema</i>	136	22
white catfish	<i>Ictalurus catus</i>	128	24
bowfin	<i>Amia calva</i>	111	25
tidewater mojarra	<i>Eucinostomus harengulus</i>	74	26
carp	<i>Cyprinus carpio</i>	65	27
black crappie	<i>Pomoxis nigromaculatus</i>	56	28
mosquitofish	<i>Gambusia affinis</i>	56	28
channel catfish	<i>Ictalurus punctatus</i>	49	30
rainwater killifish	<i>Lucania parva</i>	37	31
freshwater goby	<i>Gobionellus shufeldti</i>	35	32
hogchoker	<i>Trinectes maculatus</i>	35	32
pinfish	<i>Lagodon rhomboides</i>	28	34
pumpkinseed sunfish	<i>Lepomis gibbosus</i>	23	35
golden shiner	<i>Notemigonus crysoleucas</i>	22	36
Minnow - species TBI	<i>Minnow - Species TBI</i>	21	37
bay whiff	<i>Citharichthys spilopterus</i>	20	38
white perch	<i>Morone americana</i>	20	38
american shad	<i>Alosa sapidissima</i>	18	40
sheepshead	<i>Archosargus probatocephalus</i>	18	40
speckled worm eel	<i>Myrophis punctatus</i>	16	42
blueback herring	<i>Alosa aestivalis</i>	15	43
spotted sunfish	<i>Lepomis punctatus</i>	11	44
flathead catfish	<i>Pylodictis olivaris</i>	10	45
atlantic needlefish	<i>Strongylura marina</i>	9	46
brook silverside	<i>Labidesthes sicculus</i>	7	47
sailfin molly	<i>Poecilia latipinna</i>	7	47
sharptail goby	<i>Gobionellus hastatus</i>	6	49
warmouth sunfish	<i>Lepomis gulosus</i>	6	49
white amur	<i>Ctenopharyngodon idellus</i>	6	49
jack crevalle	<i>Caranx hippos</i>	5	52
black drum	<i>Pogonias cromis</i>	4	53
bluefish	<i>Pomatomus saltatrix</i>	4	53
chain pickerel	<i>Esox niger</i>	3	55
spotted sucker	<i>Minytrema melanops</i>	3	55
striped anchovy	<i>Anchoa hepsetus</i>	3	55
gray snapper	<i>Lutjanus griseus</i>	2	58
green sunfish	<i>Lepomis cyanellus</i>	2	58
gulf pipefish	<i>Syngnathus scovelli</i>	2	58
ladyfish	<i>Elops saurus</i>	2	58
leatherjacket	<i>Oligoplites saurus</i>	2	58
naked goby	<i>Gobiosoma boscii</i>	2	58
opossum pipefish	<i>Microphis brachyurus lineatus</i>	2	58
oyster toadfish	<i>Opsanus tau</i>	2	58
spinycheek sleeper	<i>Eleotris pisonis</i>	2	58
Tilapia species	<i>Tilapia sp.</i>	2	58
atlantic stingray	<i>Dasyatis sabina</i>	1	68
Caranx spp.	<i>caranx spp.</i>	1	68
fat sleeper	<i>Dormitator maculatus</i>	1	68
flier	<i>Centrarchus macropterus</i>	1	68
great barracuda	<i>Sphyrnaena barracuda</i>	1	68
pirate perch	<i>Aphredoderus sayanus</i>	1	68
star drum	<i>Stellifer lanceolatus</i>	1	68
		37,230	

Appendix 3 Total catch of each species by the 1/3rd mile long-line survey during Jul 1 2009 – Jun 30 2010.

Common name	Scientific name	Total catch	Rank
Shark, Atlantic sharpnose	<i>Rhizoprionodon terraenovae</i>	864	1
Red drum	<i>Sciaenops ocellatus</i>	314	2
Shark, sandbar	<i>Carcharhinus plumbeus</i>	143	3
Shark, blacktip	<i>Carcharhinus limbatus</i>	88	4
Shark, blacknose	<i>Carcharhinus acronotus</i>	64	5
Shark, finetooth	<i>Carcharhinus isodon</i>	55	6
Sea bass, black	<i>Centropristis striata</i>	30	7
Skate, clearnose	<i>Raja eglanteria</i>	25	8
Shark, bonnethead	<i>Sphyrna tiburo</i>	23	9
Toadfishes	<i>Batrachoididae</i>	22	10
Stingray, bluntnose	<i>Dasyatis say</i>	13	11
Stingray, Atlantic	<i>Dasyatis sabina</i>	10	12
Shark, lemon	<i>Negaprion brevirostris</i>	8	13
Stingray, southern	<i>Dasyatis americana</i>	7	14
Shark, spinner	<i>Carcharhinus brevipinna</i>	6	15
Stingray, roughtail	<i>Dasyatis centroura</i>	6	15
Dogfish, smooth	<i>Mustelus canis</i>	5	17
Shark, tiger	<i>Galeocerdo cuvier</i>	5	17
Horseshoe crab	<i>Limulus polyphemus</i>	5	17
Shark, scalloped hammerhead	<i>Sphyrna lewini</i>	4	20
Ray, cownose	<i>Rhinoptera bonasus</i>	4	20
Amberjack, greater	<i>Seriola dumerili</i>	3	22
Shark, nurse	<i>Ginglymostoma cirratum</i>	3	22
Catfish, gafftopsail	<i>Bagre marinus</i>	3	22
Whiting	<i>Menticirrhus americanus</i>	3	22
Shark, great hammerhead	<i>Sphyrna mokarran</i>	2	26
		1,715	

Appendix 4. Total catch of each species by fishing parties interviewed during the SFS from July 2009 – May 2010.

Species Name	Number Caught	Percent Of Total	Species Name	Number Caught	Percent Of Total
Spot	5,224	26.49%	Grouper, unidentified	20	0.10%
Red Drum	2,555	12.96%	Barracuda, Great	18	0.09%
Pinfish (Lagodon)	2,282	11.57%	Tarpon	15	0.08%
Seatrout, Spotted	1,455	7.38%	Cobia	13	0.07%
Seabass, Black	1,377	6.98%	Sea Catfish, Family	13	0.07%
Flounder, Paralichthidae	831	4.21%	Puffer, Family	13	0.07%
Kingfish, Southern	803	4.07%	Snapper, Red	11	0.06%
Bluefish	609	3.09%	Perch, Sand	11	0.06%
Flounder, Southern	550	2.79%	Wahoo	9	0.05%
Croaker, Atlantic	444	2.25%	Amberjack, Greater	8	0.04%
Unidentified Shark	421	2.13%	Triggerfish, Gray	6	0.03%
Toadfish, Oyster	370	1.88%	Bass, Striped	5	0.03%
Sheepshead	353	1.79%	Garfishes	4	0.02%
Kingfish	235	1.19%	Skate	4	0.02%
Stingray	224	1.14%	Jack, Crevalle	4	0.02%
Mackerel, Spanish	182	0.92%	Sailfish, Family	4	0.02%
Grunt Family	148	0.75%	Grouper, Scamp	4	0.02%
Lizardfish	125	0.63%	Seabasses, Family	4	0.02%
Perch, Silver	114	0.58%	Bonito, Atlantic	3	0.02%
Drum, Black	113	0.57%	Tunny, Little	3	0.02%
Snapper, Vermilion	104	0.53%	Tripletail	3	0.02%
Puffer, Northern	86	0.44%	Ribbonfish, Family	3	0.02%
Pigfish	76	0.39%	Jack, Family	3	0.02%
Pinfish (Diplodus)	75	0.38%	Catfish, Gafftopsail	2	0.01%
Searobin	66	0.33%	Shark, Blacktip	2	0.01%
Weakfish	65	0.33%	Porgy, Knobbed	2	0.01%
Unidentified Fish	64	0.32%	Skate, Clearnose	2	0.01%
Porgy, Red	60	0.30%	Tautog	2	0.01%
Mackerel, King	56	0.28%	Catfish, Flathead	2	0.01%
Seabass, Bank	49	0.25%	Flounder, Summer	2	0.01%
Spadefish, Atlantic	48	0.24%	Lionfish, <i>Pterois volitans</i>	1	0.01%
Porcupine Fish	48	0.24%	Unidentified Bottom Fish	1	0.01%
Catfish, Blue	39	0.20%	Leatherjacket, Family	1	0.01%
Shark, Bonnethead	38	0.19%	Butterfly Ray, <i>Gymnura</i> spp	1	0.01%
Ladyfish	37	0.19%	Snappers, Family	1	0.01%
Shark, Atlantic Sharpnose	36	0.18%	Shark, Blacknose	1	0.01%
Dolphin	33	0.17%	Flounder, Gulf	1	0.01%
Grouper, Gag	32	0.16%	Tuna, Blackfin	1	0.01%
Grunt, White	24	0.12%	Bass, Largemouth	1	0.01%
Eel, American	22	0.11%	Hind, Speckled	1	0.01%
Rays, <i>Dasyatidae</i>	21	0.11%	Look Down	1	0.01%
Pompano, Florida	20	0.10%			

Appendix 5. Total harvest of each species by fishing parties interviewed during the SFS from July 2009 – May 2010.

Species Name	Number Harvested	Percent Of Total	Species Name	Number Harvested	Percent Of Total
Spot	4,951	54.88%	Shark, Atlantic Sharpnose	11	0.12%
Kingfish, Southern	796	8.82%	Ladyfish	11	0.12%
Seatrout, Spotted	592	6.56%	Flounder, Paralichthidae	10	0.11%
Red Drum	576	6.38%	Cobia	9	0.10%
Flounder, Southern	541	6.00%	Wahoo	9	0.10%
Sheepshead	255	2.83%	Weakfish	7	0.08%
Seabass, Black	231	2.56%	Triggerfish, Gray	6	0.07%
Croaker, Atlantic	179	1.98%	Grouper, Gag	5	0.06%
Bluefish	115	1.27%	Jack, Crevalle	4	0.04%
Pinfish (Lagodon)	102	1.13%	Tripletail	3	0.03%
Mackerel, Spanish	76	0.84%	Grouper, Scamp	3	0.03%
Kingfish	71	0.79%	Toadfish, Oyster	3	0.03%
Perch, Silver	46	0.51%	Tautog	2	0.02%
Drum, Black	44	0.49%	Flounder, Summer	2	0.02%
Pinfish (Diplodus)	42	0.47%	Bass, Striped	2	0.02%
Mackerel, King	42	0.47%	Catfish, Flathead	2	0.02%
Catfish, Blue	35	0.39%	Porgy, Knobbed	2	0.02%
Spadefish, Atlantic	33	0.37%	Shark, Blacktip	1	0.01%
Snapper, Vermilion	31	0.34%	Tuna, Blackfin	1	0.01%
Pigfish	31	0.34%	Seabass, Bank	1	0.01%
Grunt Family	26	0.29%	Hind, Speckled	1	0.01%
Dolphin	25	0.28%	Snapper, Red	1	0.01%
Porgy, Red	22	0.24%	Flounder, Gulf	1	0.01%
Grunt, White	20	0.22%	Amberjack, Greater	1	0.01%
Tarpon	14	0.16%	Shark, Blacknose	1	0.01%
Pompano, Florida	14	0.16%	Skate	1	0.01%
Shark, Bonnethead	12	0.13%			

Project Title: Marine Finfish Habitat Management

Project PI/Coordinator: Robert M. Martore

Reporting Period: From: July 1, 2009 To: June 30, 2010

Project Objectives:

- Continue artificial reef development on existing permitted reef sites along the South Carolina coast by completing reef construction activities in accordance with the State's Marine Artificial Reef Management Plan.
- Continue to maintain a system of private aids to navigation on reef sites by following a schedule of routine inspection, maintenance and replacement on all applicable artificial reef sites.
- Continue routine performance and compliance monitoring on all permitted reef sites by following 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.
- Publish and distribute artificial reef fishing guides and material lists to keep the general public informed of the ongoing activities of the program.

Summary of Activities:

- Fourteen reef construction projects were carried out during this reporting period on 12 separate artificial reef sites encompassing every coastal county of the state. They are summarized below:

<u>Date</u>	<u>Material</u>	<u>Reef Site</u>
08 July 09	22 armored personnel carriers	Little River Reef
08 July 09	6 APC's, 4 20-ft. container boxes	Little River Offshore Reef
15 July 09	55-foot deck barge	Georgetown Nearshore Reef
21 July 09	7 concrete culvert pipes	Charleston 60' Reef
14 Sep 09	50-foot dredge barge	Little River Reef
05 Nov 09	80-foot crane barge	Edisto 40' Reef
05 Jan 10	100-foot barge with deck house	Betsy Ross Reef
05 Jan 10	100-foot deck barge	Beaufort 45' Reef
14 Jan 10	60-foot steel-hulled trawler	Edisto Offshore Reef
20 May 10	80-foot steel-hulled trawler	Comanche Reef

10 June 10	33 armored personnel carriers	Beaufort 45' Reef
15 June 10	16 armored personnel carriers	Edisto 60' Reef
15 June 10	17 armored personnel carriers	Hilton Head Reef
23 June 10	92 concrete culvert pipes	Paradise Reef

- Twenty-two days of estuarine and offshore reef monitoring were completed, including the conclusion of a spawning study on artificial reefs which documented the spawning activities of several recreationally important fish species on these reef sites.
- Twenty-nine SCUBA dives were made to conduct video surveys and document colonization of reef structures.
- Eleven missing reef buoys were replaced on offshore and inshore reef sites.
- Major media events were held for this year's Reef-Ex event, including local print and television media, as well as inclusion in a national documentary.
- Numerous presentations concerning the Reef Program were given to various fishing clubs, diving clubs, educational groups, and civic organizations around the state.

Project Title: Marine Outreach and Education Program

Project PI: Robert Wiggers

Reporting Period: July 1, 2009 through June 30, 2010

SRFAC Funding Objectives:

- Support an outreach program that focuses on making recreational boaters, anglers and associated audiences better stewards of marine resources.
- Utilize the public recreational tagging program as a tool for communicating with recreational anglers.
- Ensure that outreach events and program materials are accessible to coastal constituents in all coastal regions of South Carolina.
- Analyze and report upon historical data collected by the Marine Game Fish Tagging Program.

Summary of Activities/Accomplishments to Date:

From July 1 through April 30, 2010

- Outreach staff represented the Marine Resources Division at seven multi-day shows/expos including the Harry Hampton Hunting and Fishing Expo, Charleston Boat Show, Southeast Wildlife Expo and the Palmetto Sportsman's Classic. Attendance at these events ranged from 7,000 – 40,000 attendees.
- Through the Carolina Coastal Discovery Marine Education program, staff completed 29 vessel based education programs and 41 land based programs to students and teachers from grades K-12.
- Seven programs focusing on adult audiences were completed through the Coastal Exploration Series and collaboration with various Master Naturalist programs.
- Through the public recreational tagging program, a small contingent of taggers continues to tag and release target species. Thirty one (31) additional tag kits were supplied during the reporting period, and anglers tagged 465 fish, of which 63% 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.
- A technical report covering historical data from the Marine Game Fish Tagging Program was completed and posted to the SCDNR website.
- Public information material was distributed through the Coastal Information Distribution System (CIDS). Twenty four days were spent delivering approximately 127,000 copies of printed material to 117 vendors located throughout the coastal counties of South

Carolina. Materials included rules and regulations books, tide tables, fish rulers, fish identification posters, and regulation update cards.

- General public outreach occurs on a daily basis through response to public inquiries. Staff responded over 125 requests for information. To facilitate the dissemination of information, the Saltwater Recreational License Program website was updated to include informational videos and answers to frequently asked questions related to the use of marine resources and associated licensing requirements.

Project Title: Oyster Resource Management: Shell Recycling. Shell Planting, Monitoring and Assessment

Project PIs: Nancy Hadley, Ben Dyar and Peter Kingsley-Smith

Reporting Period: July 1, 2009 to June 30, 2010

Project 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.
- 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.
- Work to integrate assessment methods employed by shellfish biologists throughout SCDNR's Marine Resources Division to compensate for senior staff retirements and provide flexibility for future staffing.

Summary of Activities/Accomplishments to Date:

- In the 2009-2010 shellfish season (October-April), a record total of **20,374** bushels of shell was recycled (Figure 1), an increase of 34% from the previous year. Twenty-three 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 **\$34,840** by not having to purchase an equivalent quantity of Gulf Coast and whelk shells.
- 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.
- This year also saw the initiation of shell recycling from downtown Charleston restaurants through a partnership with The Nature Conservancy and Fisher Recycling. This private/public partnership is expected to expand to other counties in the future.

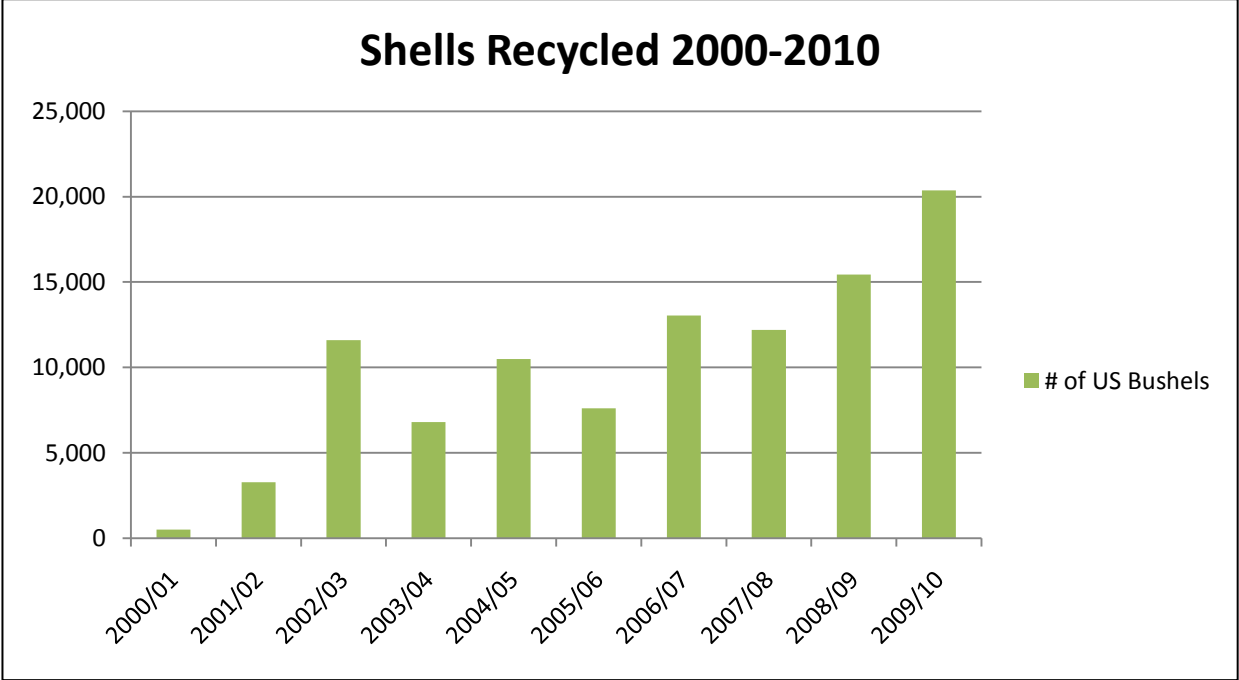


Figure 1. Since its genesis in 2000, nearly 100,000 bushels of oyster shells have been recycled through the contributions of individual consumers, local volunteers, commercial oyster roast caterers, and local restaurants. Increasing contributions reflect both an expanded program and increased public awareness.



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.



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.



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. 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 **21,762** bushels of oyster and whelk shells was planted on State and Public Shellfish Grounds between July 1, 2009 and June 30, 2010.
 - Charleston County
 - Kiawah River SSG (S-194) – **6,772** bushels
 - First Sisters SSG (S-206)(two sites) - **4,211** bushels
 - Total – **10,983** bushels of oyster shells and live seed oysters
 - Beaufort County
 - Wallace Creek SSG (S-117) – **5,579** bushels
 - Station Creek PSG (R-089) (three sites)- **5,200** bushels
 - Total – **10,779** bushels

Shell planting volume decreased from the previous year (see Figure 2) due to mid-year budget cuts, which prevented the program from contracting with commercial barges to plant in multiple locations.



Shell being planted in First Sisters Creek in Charleston County (S-206).

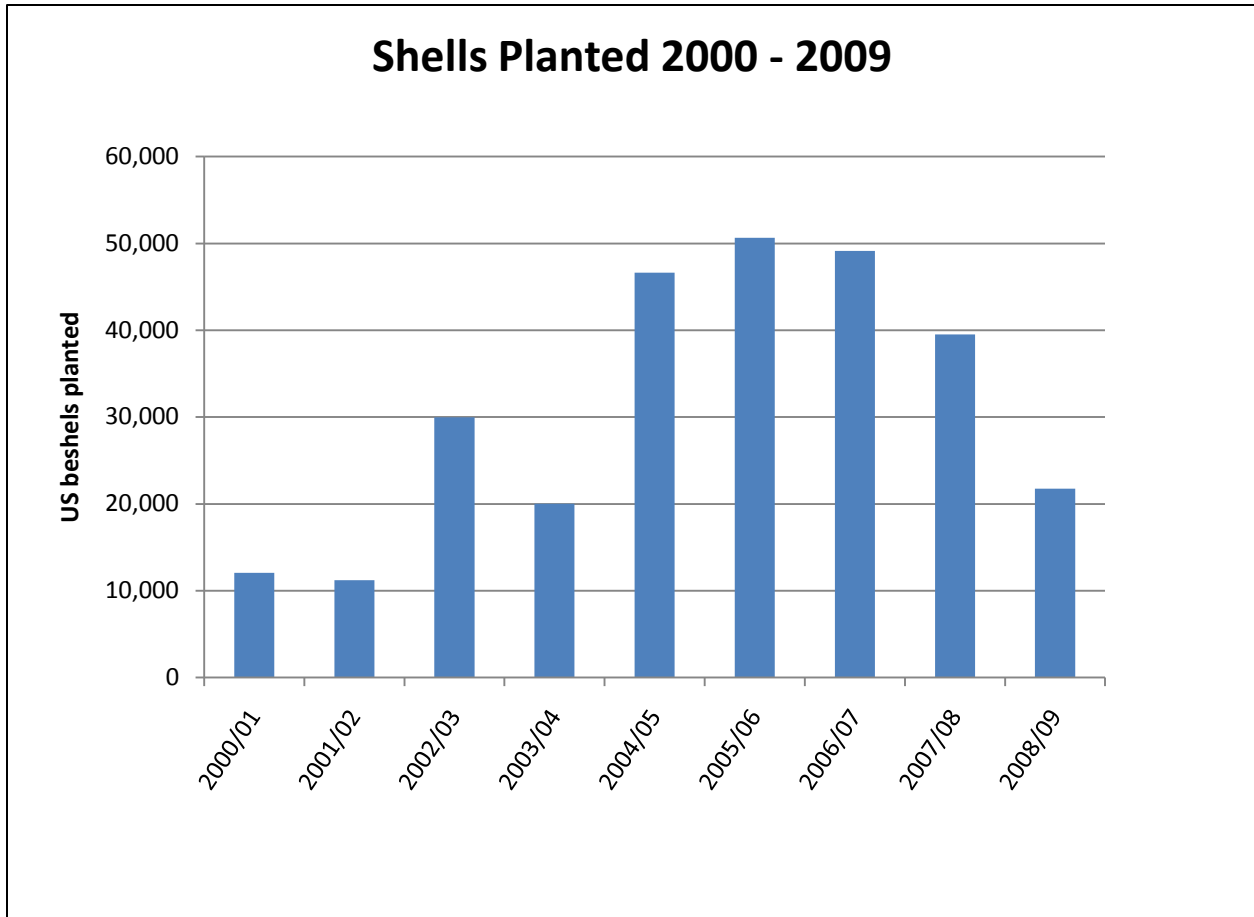


Figure 2. Bushels of shell planted on public grounds for the last 9 seasons.

- Research and management staff jointly conducted shellfish ground assessments this year in our continuing effort to develop integrated assessment methods.
- Shellfish ground maps were made available to the public both via internet access and in hard copy upon request. Signs were replaced on recreational grounds in Charleston County this year.
- 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.