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Florida Fish and Wildlife Conservation Commission

Fish & Wildlife Research Institute

Fisheries-Independent Monitoring Program 2013 Annual Data Summary Report

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Overview

This report provides a summary of the data collected in 2013 by the Florida Fish and Wildlife Conservation Commission (FWC) Fish and Wildlife Research Institute's (FWRI) Fisheries-Independent Monitoring (FIM) program. Monitoring was conducted monthly following a stratified-random sampling (SRS) design in Tampa Bay, Charlotte Harbor, the northern Indian River Lagoon, Cedar Key, the southern Indian River Lagoon, Apalachicola Bay, and northeast Florida. Gears used for routine monitoring in the various areas included 21.3-m seines, 6.1-m otter trawls, and 183-m haul seines (Table OV13-01).

There were 1,780,524 animals collected in 6,308 samples from all study areas (Figure OV13-01). The most samples were collected with 21.3-m seines (n=3,104), followed by 6.1-m otter trawls (n=1,788), and 183-m haul seines (n=1,416). Total sampling effort in the study areas ranged from 144 hauls made in southern Indian River Lagoon to 1,356 hauls made in northeast Florida (Table OV13-02). The total number of animals collected ranged from 18,717 in southern Indian River Lagoon to 578,939 in Tampa Bay. The majority of animals were collected in 21.3-m seines (n=1,275,846; 71.7% of the total catch).

Samples were dominated by small fishes such as *Anchoa mitchilli*, *Lagodon rhomboides*, *Eucinostomus* spp., and seasonal recruits such as *Leiostomus xanthurus*, *Mugil cephalus,* and *Micropogonias undulatus*. Recreationally and commercially important animals (i.e., Selected Taxa; see Table FIM13-02) accounted for 8.4% (n=150,362) of the overall catch and comprised between 3.9% (Tampa Bay) and 32.9% (southern Indian River Lagoon) of the total SRS catches from each study area. Selected Taxa were among the 10 most abundant taxa in some areas: *M. cephalus* and *Mugil curema* in the northern Indian River Lagoon; *L. xanthurus* and *M. cephalus* in Cedar Key; *Elops saurus, M. curema, Archosargus probatocephalus, M. cephalus,* and *Pogonias cromis* in the southern Indian River Lagoon; *M. undulatus, M. cephalus, L. xanthurus,* and *Cynoscion arenarius* in Apalachicola Bay; and *M. undulatus, L. xanthurus, M. cephalus, and Litopenaeus setiferus* in northeast Florida (Tables OV13-03 and –04).

A total of 2,108 fish and select invertebrates were culled for fish health analyses of gross external abnormalities (including external parasites). Numbers of reported abnormalities from each study area ranged from two (Cedar Key) to 1,937 (northern Indian River Lagoon; see Fish Health section).

Species profiles, including indices of young-of-the-year relative abundance, were generated for many species of commercial, recreational, or ecological importance: *Sciaenops ocellatus* (Red Drum), *Cynoscion nebulosus* (Spotted Seatrout), *A. probatocephalus* (Sheepshead), *M. cephalus* (Striped Mullet), *L. rhomboides* (Pinfish), *Centropomus undecimalis* (Common Snook), and *Callinectes sapidus* (Blue Crab; see Species Profile section).

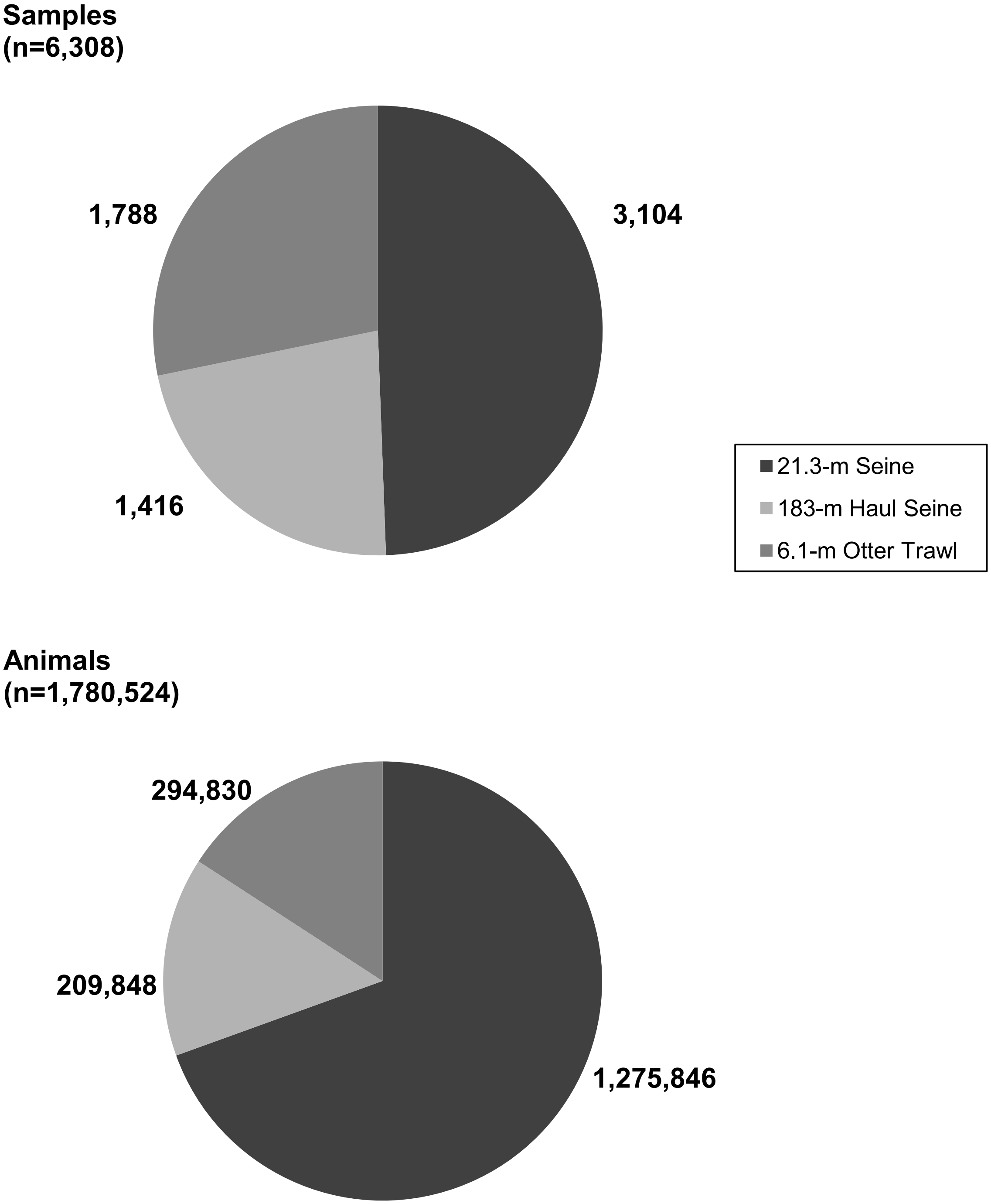

Figure OV13-01. Summary of 2013 FIM program catch and effort data. ‘Samples’ are the total number of deployments by gear, and ‘Animals’ are the total number of animals collected by each sampling method.

Table OV13-01. Gear usage by field laboratory for FIM program stratified-random sampling, 2013.

Field Lab	21.3-m Seines		183-m Haul Seines	6.1-m Otter Trawls
	Bay	River		
Tampa Bay	X	X	X	X
Charlotte Harbor	X	X	X	X
N. Indian River	X	X	X	X
Cedar Key	X	X	X	X
S. Indian River			X	
Apalachicola	X	X	X	X
Northeast Florida		X	X	X

Table OV13-02. Summary of catch and effort data by area for FIM program stratified-random sampling, 2013. 'Hauls' are the total number of net deployments by each gear, and 'Animals' are the total number of animals collected by each sampling method.

Gear	**Tampa Bay**		**Charlotte Harbor**	
	Hauls	**Animals**	**Hauls**	**Animals**
21.3-m seine	720	419,225	504	174,769
183-m haul seine	240	71,875	204	28,941
6.1-m otter trawl	336	87,839	360	29,318
Totals	**1,296**	**578,939**	**1,068**	**233,028**

Gear	**N. Indian River Lagoon**		**Cedar Key**	
	Hauls	**Animals**	**Hauls**	**Animals**
21.3-m seine	488	383,977	420	111,487
183-m haul seine	228	46,778	192	15,205
6.1-m otter trawl	96	6,258	180	8,909
Totals	**812**	**437,013**	**792**	**135,601**

Gear	**S. Indian River Lagoon**		**Apalachicola Bay**	
	Hauls	**Animals**	**Hauls**	**Animals**
21.3-m seine	.	.	396	65,695
183-m haul seine	144	18,717	216	20,555
6.1-m otter trawl	.	.	228	102,826
Totals	**144**	**18,717**	**840**	**189,076**

Gear	**Northeast Florida**	
	Hauls	**Animals**
21.3-m seine	576	120,693
183-m haul seine	192	7,777
6.1-m otter trawl	588	59,680
Totals	**1,356**	**188,150**

Table OV13-03. Top 10 numerically dominant taxa collected in FIM program stratified-random sample areas, 2013.

Tampa Bay		**Charlotte Harbor**	
Scientific Name	**Number**	**Scientific Name**	**Number**
Anchoa mitchilli	307,245	*Anchoa mitchilli*	69,119
Lagodon rhomboides	66,048	*Lagodon rhomboides*	47,860
Harengula jaguana	43,668	*Eucinostomus* spp.	29,181
Eucinostomus spp.	34,017	*Lucania parva*	13,625
Anchoa cubana	22,348	*Anchoa hepsetus*	13,494
Menidia spp.	14,897	*Eucinostomus gula*	5,368
Eucinostomus gula	10,637	*Menidia* spp.	4,938
Lucania parva	9,167	*Ariopsis felis*	4,385
Eucinostomus harengulus	7,705	*Orthopristis chrysoptera*	4,298
Orthopristis chrysoptera	5,609	*Bairdiella chrysoura*	2,903
Σ =	**521,341**		**195,171**
Total (Selected Taxa)	**22,602**		**15,345**
Grand Total of Animals Collected	**578,939**		**233,028**

N. Indian River Lagoon		**Cedar Key**	
Scientific Name	**Number**	**Scientific Name**	**Number**
Anchoa mitchilli	298,297	*Anchoa hepsetus*	51,254
Eucinostomus spp.	24,052	*Anchoa mitchilli*	41,846
Diapterus auratus	14,075	*Bairdiella chrysoura*	5,721
Harengula jaguana	13,308	*Lagodon rhomboides*	4,330
Eucinostomus harengulus	8,478	*Leiostomus xanthurus*	3,604
Mugil curema	8,357	*Membras martinica*	3,293
Brevoortia spp.	6,417	*Eucinostomus* spp.	2,291
Menidia spp.	6,406	*Harengula jaguana*	2,278
Lagodon rhomboides	5,840	*Mugil cephalus*	2,170
Mugil cephalus	5,036	*Menidia* spp.	2,007
Σ =	**390,266**		**118,794**
Total (Selected Taxa)	**23,763**		**10,616**
Grand Total of Animals Collected	**437,013**		**135,601**

Table OV13-03. (Continued)

S. Indian River Lagoon		**Apalachicola Bay**	
Scientific Name	**Number**	**Scientific Name**	**Number**
Lagodon rhomboides	4,526	*Anchoa mitchilli*	77,215
Diapterus auratus	2,621	*Anchoa cubana*	20,107
Elops saurus	1,357	*Lagodon rhomboides*	15,809
Mugil curema	1,284	*Anchoa lyolepis*	9,844
Ariopsis felis	1,162	*Micropogonias undulatus*	6,348
Archosargus probatocephalus	869	*Bairdiella chrysoura*	4,510
Orthopristis chrysoptera	836	*Mugil cephalus*	4,442
Mugil cephalus	720	*Menidia* spp.	4,091
Eucinostomus gula	631	*Leiostomus xanthurus*	3,859
Pogonias cromis	576	*Cynoscion arenarius*	3,747
Σ =	**14,582**		**149,972**
Total (Selected Taxa)	**6,166**		**27,770**
Grand Total of Animals Collected	**18,717**		**189,076**

Northeast Florida	
Scientific Name	**Number**
Anchoa mitchilli	64,961
Micropogonias undulatus	22,991
Menidia menidia	22,235
Menidia spp.	9,312
Leiostomus xanthurus	8,911
Stellifer lanceolatus	6,937
Gambusia holbrooki	5,745
Lucania parva	4,102
Mugil cephalus	3,377
Litopenaeus setiferus	3,359
Σ =	**151,930**
Total (Selected Taxa)	**44,100**
Grand Total of Animals Collected	**188,150**

Table OV13-04. Number of recreational or commercially important species (Selected Taxa) collected in the FIM program stratified-random sample areas, 2013.

Tampa Bay		Charlotte Harbor	
Scientific Name	**Number**	**Scientific Name**	**Number**
Leiostomus xanthurus	3,777	*Cynoscion arenarius*	2,569
Elops saurus	2,580	*Farfantepenaeus duorarum*	2,566
Sciaenops ocellatus	2,302	*Sciaenops ocellatus*	2,018
Centropomus undecimalis	2,177	*Callinectes sapidus*	1,038
Farfantepenaeus duorarum	1,991	*Lutjanus griseus*	867
Cynoscion arenarius	1,871	*Archosargus probatocephalus*	753
Callinectes sapidus	1,739	*Centropomus undecimalis*	747
Mugil cephalus	1,390	*Leiostomus xanthurus*	723
Archosargus probatocephalus	1,254	*Cynoscion nebulosus*	577
Menticirrhus americanus	818	*Mugil cephalus*	513
Cynoscion nebulosus	632	*Elops saurus*	480
Mugil trichodon	524	*Menticirrhus americanus*	450
Paralichthys albigutta	427	*Mugil trichodon*	446
Lutjanus griseus	390	*Mugil curema*	426
Mugil curema	207	*Lutjanus synagris*	416
Lutjanus synagris	167	*Menippe* spp.	406
Pogonias cromis	127	*Trachinotus falcatus*	76
Menippe spp.	122	*Paralichthys albigutta*	75
Trachinotus falcatus	27	*Pogonias cromis*	53
Scomberomorus maculatus	24	*Mycteroperca microlepis*	51
Menticirrhus saxatilis	17	*Trachinotus carolinus*	39
Mycteroperca microlepis	16	*Albula vulpes*	15
Trachinotus carolinus	13	*Menticirrhus saxatilis*	14
Micropogonias undulatus	4	*Scomberomorus maculatus*	13
Penaeidae spp.	3	*Micropogonias undulatus*	4
Pomatomus saltatrix	2	*Epinephelus itajara*	3
Albula vulpes	1	*Pomatomus saltatrix*	2
		Epinephelus morio	2
		Rachycentron canadum	1
		Menticirrhus littoralis	1
		Lutjanus analis	1
Total	**22,602**	**Total**	**15,345**

Table OV13-04. (Continued)

N. Indian River Lagoon		**Cedar Key**	
Scientific Name	**Number**	**Scientific Name**	**Number**
Mugil curema	8,357	*Leiostomus xanthurus*	3,604
Mugil cephalus	5,036	*Mugil cephalus*	2,170
Archosargus probatocephalus	2,803	*Callinectes sapidus*	947
Leiostomus xanthurus	1,397	*Menticirrhus americanus*	659
Farfantepenaeus spp.	1,236	*Cynoscion arenarius*	582
Sciaenops ocellatus	1,045	*Sciaenops ocellatus*	519
Pogonias cromis	744	*Elops saurus*	310
Centropomus undecimalis	683	*Pogonias cromis*	266
Elops saurus	665	*Paralichthys albigutta*	222
Cynoscion nebulosus	321	*Mugil curema*	206
Callinectes sapidus	273	*Menippe* spp.	192
Menticirrhus americanus	248	*Cynoscion nebulosus*	155
Micropogonias undulatus	222	*Farfantepenaeus* spp.	136
Trachinotus falcatus	172	*Micropogonias undulatus*	128
Lutjanus griseus	158	*Archosargus probatocephalus*	125
Litopenaeus setiferus	64	*Farfantepenaeus duorarum*	120
Farfantepenaeus duorarum	61	*Lutjanus synagris*	64
Paralichthys albigutta	49	*Trachinotus falcatus*	47
Farfantepenaeus aztecus	44	*Lutjanus griseus*	37
Lutjanus analis	44	*Menticirrhus saxatilis*	32
Pomatomus saltatrix	35	*Scomberomorus maculatus*	26
Albula vulpes	33	*Mugil trichodon*	20
Menippe spp.	20	*Centropomus undecimalis*	19
Mugil rubrioculus	16	*Trachinotus carolinus*	7
Lutjanus synagris	13	*Pomatomus saltatrix*	6
Scomberomorus regalis	6	*Paralichthys lethostigma*	6
Trachinotus carolinus	5	*Rachycentron canadum*	4
Scomberomorus maculatus	3	*Mycteroperca microlepis*	4
Cynoscion complex	3	*Albula vulpes*	2
Megalops atlanticus	2	*Megalops atlanticus*	1
Panulirus argus	2		
Paralichthys lethostigma	2		
Lutjanus jocu	1		
Total	**23,763**	**Total**	**10,616**

Table OV13-04. (Continued)

S. Indian River Lagoon		**Apalachicola Bay**	
Scientific Name	**Number**	**Scientific Name**	**Number**
Elops saurus	1,357	*Micropogonias undulatus*	6,348
Mugil curema	1,284	*Mugil cephalus*	4,442
Archosargus probatocephalus	869	*Leiostomus xanthurus*	3,859
Mugil cephalus	720	*Cynoscion arenarius*	3,747
Pogonias cromis	576	*Litopenaeus setiferus*	2,204
Centropomus undecimalis	493	*Farfantepenaeus* spp.	1,391
Lutjanus synagris	162	*Mugil curema*	1,104
Lutjanus griseus	149	*Callinectes sapidus*	914
Lutjanus analis	133	*Sciaenops ocellatus*	746
Micropogonias undulatus	132	*Farfantepenaeus duorarum*	581
Sciaenops ocellatus	82	*Menticirrhus americanus*	575
Trachinotus falcatus	38	*Pogonias cromis*	347
Leiostomus xanthurus	38	*Cynoscion nebulosus*	328
Callinectes sapidus	37	*Paralichthys albigutta*	215
Trachinotus carolinus	23	*Lutjanus synagris*	192
Cynoscion nebulosus	15	*Elops saurus*	165
Paralichthys albigutta	15	*Archosargus probatocephalus*	165
Scomberomorus maculatus	11	*Farfantepenaeus aztecus*	104
Pomatomus saltatrix	8	*Menippe* spp.	97
Mycteroperca microlepis	4	*Menticirrhus saxatilis*	44
Epinephelus itajara	3	*Lutjanus griseus*	41
Paralichthys lethostigma	3	*Trachinotus carolinus*	39
Megalops atlanticus	3	*Menticirrhus littoralis*	35
Cynoscion complex	3	*Paralichthys lethostigma*	22
Lutjanus apodus	2	*Trachinotus falcatus*	22
Scomberomorus regalis	2	*Cynoscion nothus*	11
Panulirus argus	2	*Scomberomorus maculatus*	11
Albula vulpes	1	*Mycteroperca microlepis*	10
Lutjanus cyanopterus	1	*Paralichthys squamilentus*	4
		Pomatomus saltatrix	3
		Albula vulpes	2
		Penaeidae spp.	2
Total	**6,166**	**Total**	**27,770**

Table OV13-04. (Continued)

Northeast Florida Scientific Name	Number
Micropogonias undulatus	22,991
Leiostomus xanthurus	8,911
Mugil cephalus	3,377
Litopenaeus setiferus	3,359
Mugil curema	1,195
Farfantepenaeus spp.	987
Callinectes sapidus	983
Cynoscion complex	394
Elops saurus	386
Farfantepenaeus aztecus	295
Paralichthys lethostigma	220
Sciaenops ocellatus	196
Menticirrhus americanus	186
Trachinotus falcatus	127
Cynoscion nebulosus	123
Archosargus probatocephalus	74
Paralichthys albigutta	56
Pomatomus saltatrix	39
Trachinotus carolinus	37
Pogonias cromis	33
Centropomus undecimalis	30
Lutjanus griseus	30
Paralichthys dentatus	27
Farfantepenaeus duorarum	18
Menticirrhus saxatilis	9
Lutjanus synagris	8
Albula vulpes	3
Cynoscion nothus	2
Scomberomorus maculatus	2
Menippe spp.	1
Paralichthys squamilentus	1
Total	**44,100**

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Fisheries-Independent Monitoring

Introduction

The Florida Fish and Wildlife Conservation Commission (FWC) Fish and Wildlife Research Institute's (FWRI) Fisheries-Independent Monitoring (FIM) program is a long-term program designed to monitor the relative abundance of fishery resources in Florida's major estuarine, coastal, and reef systems. The program was developed to: 1) address the critical need for effective assessment techniques for an array of species and sizes of fishes and selected invertebrates; 2) provide timely information for use in management plans; and 3) monitor trends in the relative abundance of taxa in a variety of estuarine and marine systems throughout Florida.

Proper management of Florida's marine fisheries resources requires information from a number of sources. Traditional methods of monitoring changes in fish stocks have used catch-per-unit-effort (CPUE) data derived directly from commercial and recreational fisheries. Analysis of these fisheries-dependent data can provide some information on the status of fish stocks; however, there are inherent problems in using data from these sources. Changes in vessel types, fleet size, fishing gear, or methods of operation can make fisheries-dependent data difficult to interpret (Ultang 1977). Additionally, closed seasons, changes in size or bag limits, and fluctuations in market values can further bias catch data and subsequent analyses. Fisheries-independent sampling, which targets juvenile and sub-adult fishes that have not been subjected to fishing pressure, can provide less biased estimates of trends in fish stocks than fisheries-dependent sampling (Myers and Cadigan 1993). Changes in juvenile abundance within a season can be attributed to natural mortality, immigration, emigration, or recruitment. Shifts in juvenile abundance can also be used to forecast changes in the adult stock, allowing necessary modifications to harvest regulations to be implemented before the fish have fully recruited to the fishery (Goodyear 1985). The FIM program was established to provide this type of timely information for use in management plans.

The Fish and Wildlife Research Institute initiated the FIM program in 1985 with funding provided by a Federal Sport Fish Restoration (SFR) grant. In 1988, additional funding became available from special appropriations. The FIM program is now partially supported by funds from the sale of Florida saltwater fishing licenses as well as the SFR grant. Fisheries-Independent Monitoring program sampling began in Tampa Bay and Charlotte Harbor during 1989, in the northern Indian River Lagoon (IRL) during 1990, in Cedar Key during 1996, in the southern IRL during 1997, in Apalachicola Bay during 1998, and in northeast Florida during 2001. Sampling was also conducted in Choctawhatchee Bay/Santa Rosa Sound between 1992 and 1997, in Florida Bay between 1993 and 1997, and in Florida Keys National Marine Sanctuary between 1998 and 2004 (Figure FIM13-01).

Florida's coastline extends from subtropical to temperate regions and includes habitats such as seagrass beds, salt marshes, and mangroves. These habitats provide critical nursery areas for many fish and invertebrate species. It is estimated that more than 70% of the recreationally-important species and more than 90% of the commercially-important species in the Gulf of Mexico are estuarine-dependent during at least one stage of their life histories (Lindall and Saloman 1997). The FIM program data are summarized and analyzed for all fish and selected invertebrate species collected, yielding information on the relative abundance, recruitment, habitat use, and distribution of hundreds of estuarine and marine species. This approach provides a unique source of information on economically valuable species as well as on many poorly understood non-game species that may influence fisheries or may be important ecological indicators. This type of multi-species, multi-habitat, long-term monitoring program is extremely valuable for documenting ecosystem changes, evaluating the effects of natural and anthropogenic disturbances, and making management decisions (Coull 1985, Wolfe et al. 1987).

Although the FIM program has always used a suite of gears (e.g., seines, trawls, trammel nets) capable of capturing a broad range of fish species and sizes from a variety of habitats, initial program efforts focused primarily on collecting young-of-the-year (YOY) fishes that could be used to develop recruitment indices. The program expanded its efforts to monitor larger-sized fishes in Tampa Bay by developing 183-m haul seines (fixed stations sampled between 1993 and 1995; year-round stratified-random sampling [SRS] implemented in 1996), 183-m purse seines (implemented in

1997; discontinued in 2004), and by developing a visual sampling program for reef fishes in the Florida Keys (implemented in 1998; discontinued in 2004). The 183-m haul seine was implemented as part of the SRS component of the program in Charlotte Harbor during 1996, in the northern and southern IRL and Cedar Key during 1997, in Apalachicola Bay during 1998, and in northeast Florida during 2001. The purse seine was implemented for SRS in Charlotte Harbor in 1998 and was used on a trial basis in Apalachicola Bay during 2000 and 2001, but was no longer used in any sampling area after 2004. Through the use of visual surveys in the Florida Keys, fisheries-independent information was obtained in this unique area of Florida for the first time in 1998, but was no longer incorporated as part of the FIM program after 2004. The FIM program also implemented a seasonal directed sampling program for striped mullet (*Mugil cephalus*) in Tampa Bay and Charlotte Harbor in 1993 utilizing a 366-m trammel net. The seasonal directed sampling program was discontinued in both areas after the 2008-2009 sampling season and has transitioned into a year-round monthly sampling survey completed every five years. The entire suite of gears and methods used by the FIM program captures fishes at various stages of development, from initial recruitment into the estuary through harvestable sizes, thereby providing a continuous gauge of a particular stock's relative abundance, age and size composition, and reproductive potential. This report summarizes FIM program SRS data collected during 2013. Results from the sampling efforts in each estuary are presented separately. This report also summarizes results from fish health monitoring of samples collected by the FIM program. Profiles of several species that are of particular interest because of their recreational or commercial value in Florida are also presented, providing critical information for these species while also describing some of the ways the FIM program data are used to assess the status of important Florida fisheries.

Methods

The FIM program uses a stratified-random sampling design in all study areas. Each study area was divided into sampling zones based upon geographic and logistical criteria, and each zone was further subdivided into 1-nm^2 grids that were randomly selected for sampling. Sampling grids were stratified by habitat and depth, thereby identifying the gear types that could be used in those areas. A single sample was collected at each randomly selected site. In most cases, the number of monthly samples collected in each zone with each gear was proportional to the number of grids in the zone that could be sampled with a particular gear.

The FIM program uses a multi-gear approach to collect data on various life history stages of fishes and selected invertebrates from a wide variety of habitats (Table FIM13-01). A 21.3-m center bag seine targeted YOY and juvenile fishes in shallow water (≤ 1.8-m); a 6.1-m otter trawl targeted YOY, juvenile, and adult fish in deep water (1.0 – 7.6-m); a 183-m haul seine targeted sub-adult and adult fish along shorelines in water depths ≤ 2.5-m. Several different techniques were used, depending upon habitat, to stratify the samples collected with the various gears. The 21.3-m center bag seine was used in Tampa Bay, Charlotte Harbor, the northern IRL, Cedar Key, Apalachicola Bay, and northeast Florida. Two deployment techniques were used. The bay seine technique was used in all estuaries except northeast Florida to sample shallow areas, and was pre-stratified by the presence or absence of bottom vegetation (except in the Cedar Key area) or the presence of a shoreline. The river seine technique was used in all estuaries to sample the shorelines of creeks and rivers. River seine deployments in Tampa Bay and Charlotte Harbor were pre-stratified by the presence or absence of overhanging shoreline vegetation. River seine deployments in the northern IRL, Cedar Key, Apalachicola Bay, and northeast Florida were not pre-stratified by habitat type. Samples collected with 183-m haul seines in Tampa Bay and Charlotte Harbor were pre-stratified by the presence or absence of overhanging shoreline vegetation. Samples collected with 183-m haul seines in the northern and southern IRL were post-stratified by the presence or absence of overhanging shoreline vegetation. Samples collected with this gear were not stratified by habitat type in Cedar Key, Apalachicola Bay, and northeast Florida. All sampling was conducted during daytime hours (one hour after sunrise to one hour before sunset). Additional sampling details are described in the FIM program’s Procedure Manual (FWC-FWRI 2013).

The sample work-up technique was similar for all samples, regardless of gear type or sampling regime. Environmental data consisting of water chemistry, habitat characteristics, and physical parameters such as current and tidal conditions were recorded for each sample. All fish and selected invertebrate species captured were identified to the lowest practical taxonomic level, counted, and a random sample of at least 10 individuals were measured (standard length for teleosts, precaudal length for sharks, disc width for rays, carapace width for crabs, and post-orbital head length for shrimp). A detailed explanation of the standard sample work-up for data collection is described in the FIM program's Procedure Manual (FWC-FWRI 2013).

Certain taxa were not identified to species because of the possibility of hybridization (e.g., *Brevoortia* spp., *Menidia* spp.; Dahlberg 1970, Middaugh et al. 1986) or because they were morphologically or meristically indistinguishable at small juvenile sizes (e.g., *Eucinostomus* spp. <40 mm SL; Matheson 1983). In northern and southern IRL and northeast Florida sections, species accounts of *Cynoscion regalis* (Weakfish) and *Cynoscion arenarius* (Sand Seatrout) will be referred to collectively as *Cynoscion* complex. These two species mix and hybridize along the Atlantic coast of Florida and identification can only be determined with certainty by genetic testing (Tringali et al. 2004). Animals were released except for representative samples of each taxon (for laboratory confirmation of field identifications) and samples required for specific research projects. The taxonomic nomenclature in this report follows the American Fisheries Society's Common and Scientific Names of Fishes (Page et al. 2013). A detailed explanation of the standard sample work-up for data collection is described in the FIM program's Procedure Manual (FWC-FWRI 2013).

Data for this report were summarized separately for each estuarine system and for each gear type. Data were also summarized separately for all taxa and for taxa of recreational or commercial importance ('Selected Taxa'; Table FIM13-02). Abundance estimates were calculated for 21.3-m seines and 6.1-m trawls as the number of individuals/100 m^2 of area sampled. Catch-per-unit-effort (CPUE) was calculated for 183-m haul seine samples as the number of animals/set. The appendices for each study area describe the catch by month, gear, stratum, and zone.

Study Areas

The FIM program conducted sampling in Tampa Bay, Charlotte Harbor, the northern IRL, Cedar Key, the southern IRL, Apalachicola Bay, and northeast Florida,

(Figure FIM13-01). Sampling was conducted over a wide range of habitats encompassing different bottom types, shoreline types, and offshore areas. In addition to sampling in major estuaries, tidally-influenced portions of rivers that flow into Tampa Bay (Alafia, Braden, Little Manatee, and Manatee rivers), Charlotte Harbor (Peace, Myakka, and Caloosahatchee rivers), the Indian River Lagoon (Turkey Creek, St. Sebastian, and St. Lucie rivers), the Cedar Key area (Suwannee River), Apalachicola Bay (Apalachicola River), and northeast Florida (St. Marys, Nassau, and St. Johns rivers) were sampled. The Tampa Bay, Charlotte Harbor, and northern IRL study areas were described in the FIM Program 1994 Annual Data Summary Report (FDEP-FMRI 1995). The Cedar Key study area was described in the FIM Program 1996 Annual Data Summary Report (FDEP-FMRI 1997); the southern IRL study area was described in the FIM Program 1997 Annual Data Summary Report (FDEP-FMRI 1998); the Apalachicola Bay study area and changes to the southern IRL study area were described in the FIM Program 1998 Annual Data Summary Report (FDEP-FMRI 1999); and the northeast Florida study area was described in the FIM Program 2001 Annual Data Summary Report (FDEP-FMRI 2002).

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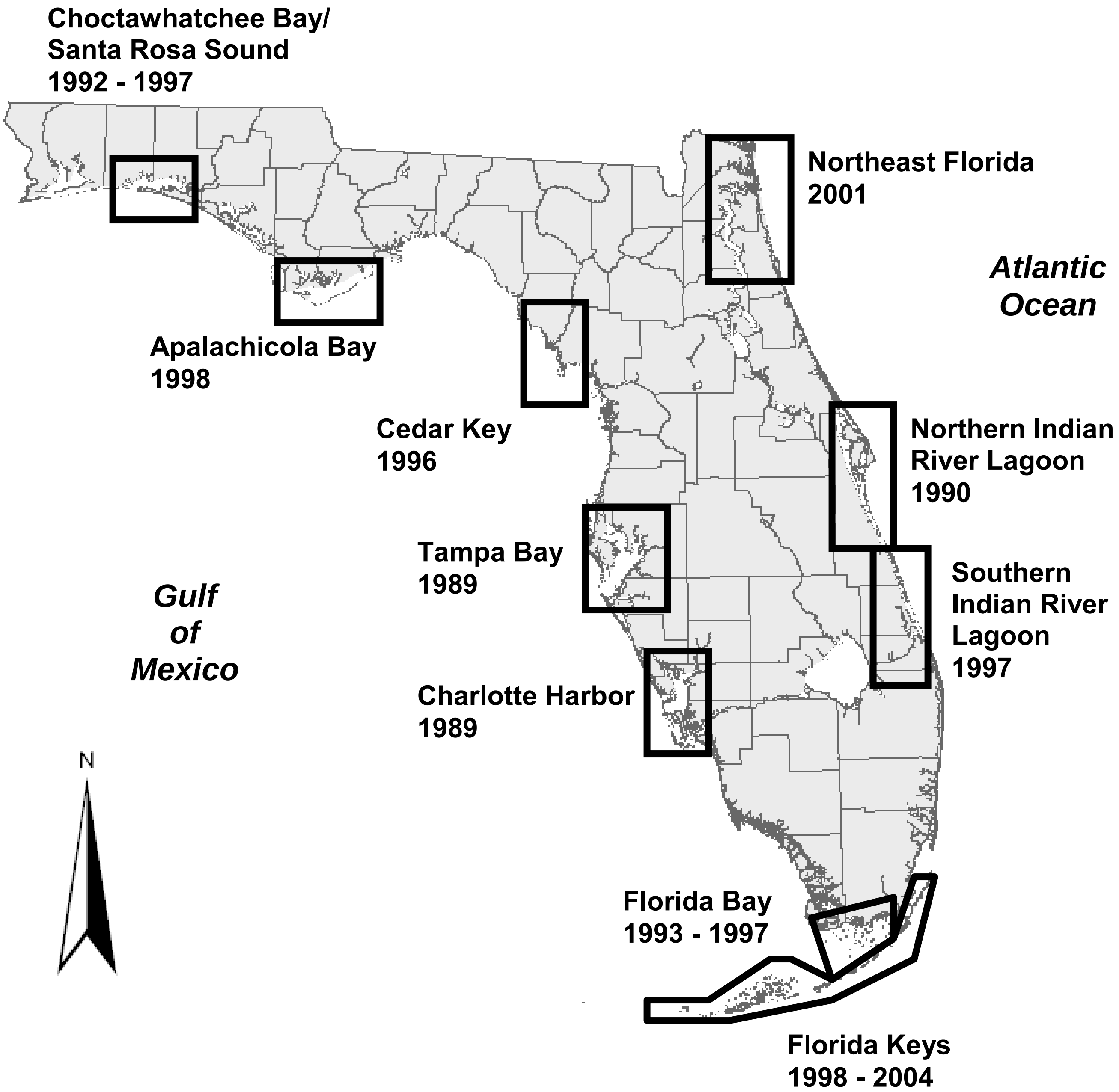

Figure FIM13-01. Locations of Fisheries-Independent Monitoring program field laboratories. Years indicate initiation of sampling. If sampling was discontinued at a field lab, the last year of sampling is also provided.

Table FIM13-01. Description of monthly monitoring sampling gears used in 2013. A more detailed description of each gear can be found in the FIM program's Procedure Manual.

Gear	Deployment	Mesh Size (mm)	Area Sampled	Description of use
21.3-m Seine (center bag)	Bay	3.2	140 m^2	• used in near-shore and shoreline areas ≤ 1.5 m
	River	3.2	68 m^2	• used along river shorelines ≤ 1.8 m
183-m Haul Seine (center bag)	Boat	38.1	4,120 m^2	• used along shorelines and exposed sandbars ≤ 2.5 m
6.1-m Otter Trawl	Straight Tow	38.1 (3.2-mm liner)	1,130 m^2-2,259 m^2	• used in areas from 1.8-m to 7.6-m deep
	Arc Tow	38.1 (3.2-mm liner)	1,130 m^2-2,259 m^2	• used in areas from 1.0-m to 1.7-m deep

Table FIM13-02. Animals designated as Selected Taxa because of their commercial or recreational importance.

Scientific Name	**Common Name**
Albula vulpes	Bonefish
Alphestes afer	Mutton Hamlet
Archosargus probatocephalus	Sheepshead
Callinectes sapidus	Blue Crab
Centropomus undecimalis	Common Snook
Cephalopholis cruentata	Graysby
Cephalopholis fulva	Coney
Cynoscion arenarius	Sand Seatrout
Cynoscion complex	Seatrout
Cynoscion nebulosus	Spotted Seatrout
Cynoscion nothus	Silver Seatrout
Cynoscion regalis	Weakfish
Dermatolepis inermis	Marbled Grouper
Elops saurus	Ladyfish
Epinephelus adscensionis	Rock Hind
Epinephelus drummondhayi	Speckled Hind
Epinephelus guttatus	Red Hind
Epinephelus itajara	Atlantic Goliath Grouper
Epinephelus morio	Red Grouper
Epinephelus striatus	Nassau Grouper
Farfantepenaeus aztecus	Brown Shrimp
Farfantepenaeus brasiliensis	Pinkspot Shrimp
Farfantepenaeus duorarum	Pink Shrimp
Farfantepenaeus spp.	Penaeid Shrimps
Hyporthodus flavolimbatus	Yellowedge Grouper
Hyporthodus mystacinus	Misty Grouper
Hyporthodus nigritus	Warsaw Grouper
Hyporthodus niveatus	Snowy Grouper
Leiostomus xanthurus	Spot
Litopenaeus setiferus	White Shrimp
Lutjanus analis	Mutton Snapper
Lutjanus apodus	Schoolmaster
Lutjanus buccanella	Blackfin Snapper
Lutjanus campechanus	Red Snapper
Lutjanus cyanopterus	Cubera Snapper
Lutjanus griseus	Gray Snapper

Table FIM13-02. (Continued)

Scientific Name	**Common Name**
Lutjanus jocu	Dog Snapper
Lutjanus mahogani	Mahogany Snapper
Lutjanus synagris	Lane Snapper
Lutjanus vivanus	Silk Snapper
Megalops atlanticus	Tarpon
Menippe spp.	Stone Crab
Menticirrhus americanus	Southern Kingfish
Menticirrhus littoralis	Gulf Kingfish
Menticirrhus saxatilis	Northern Kingfish
Micropogonias undulatus	Atlantic Croaker
Mugil cephalus	Striped Mullet
Mugil curema	White Mullet
Mugil liza	Liza
Mugil rubrioculus	Redeye Mullet
Mugil trichodon	Fantail Mullet
Mycteroperca bonaci	Black Grouper
Mycteroperca microlepis	Gag
Mycteroperca phenax	Scamp
Mycteroperca tigris	Tiger Grouper
Mycteroperca venenosa	Yellowfin Grouper
Panulirus argus	Spiny Lobster
Paralichthys albigutta	Gulf Flounder
Paralichthys dentatus	Summer Flounder
Paralichthys lethostigma	Southern Flounder
Paralichthys oblongus	Fourspot Flounder
Paralichthys squamilentus	Broad Flounder
Penaeidae spp.	Shrimps
Pogonias cromis	Black Drum
Pomatomus saltatrix	Bluefish
Rachycentron canadum	Cobia
Sciaenops ocellatus	Red Drum
Scomberomorus cavalla	King Mackerel
Scomberomorus maculatus	Spanish Mackerel
Scomberomorus regalis	Cero
Trachinotus carolinus	Florida Pompano
Trachinotus falcatus	Permit
Trachinotus goodei	Palometa

Tampa Bay

Tampa Bay is a drowned river estuary located on the western central coast of Florida. The bay is connected to the Gulf of Mexico through two main channels located on either side of Egmont Key and several smaller passes and channels to the north of Mullet and Long Keys and to the south of Anna Maria Island. Freshwater inflow into the bay comes from over 100 tributaries, although more than 80% enters from four main rivers (Alafia, Hillsborough, Manatee, and Little Manatee; Schmidt and Luther 2002). Shoreline vegetation consists largely of mangroves and marsh grasses, and bottom substrates are typically characterized as sand, mud, oysters, or a combination thereof (Flannery 1989). Seagrass meadows are the dominant vegetative cover in Tampa Bay and are widely distributed throughout the bay (Haddad 1989).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in Tampa Bay since 1989. The area sampled was divided into five geographically-defined bay zones (A-E) and four riverine zones (K-N; Figure TB13-01). The riverine zones were defined as the Alafia (K), Little Manatee (L), Manatee (M), and Braden (N) rivers. Monthly stratified-random sampling (SRS) was conducted in Zones A-E using 21.3-m bay seines, 183-m haul seines, and 6.1-m bay otter trawls. Monthly SRS was conducted in Zones K-N with 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2013 in Tampa Bay.

Stratified-Random Sampling

A total of 578,939 animals, which included 143 taxa of fishes and 10 taxa of selected invertebrates, were collected from 1,296 Tampa Bay SRS samples in 2013 (Table TB13-01, Appendices TB13-01, -02, and -03). *Anchoa mitchilli* (n=307,245) was the most numerous taxon collected, representing 53.1% of the total catch. *Lagodon rhomboides* (n=66,048) was the next most abundant taxon collected, accounting for an additional 11.4% of the total catch. Twenty-six Selected Taxa (n=22,602 animals) composed 3.9% of the total catch. *Leiostomus xanthurus* (n=3,777) was the most abundant Selected Taxon, representing 0.7% of the total catch. *Elops saurus* (n=2,580), *Sciaenops ocellatus* (n=2,302), and *Centropomus undecimalis* (n=2,177) were the next most abundant

Selected Taxa, comprising an additional 1.2% of the total catch. Collections in 2013 included one species new to the Tampa Bay FIM collection: *Elops smithi* (Malacho).

Bay Sampling

21.3-m Bay Seines. A total of 204,311 animals were collected in 408 21.3-m bay seines, representing 35.3% of the overall SRS catch (Table TB13-01). *Anchoa mitchilli* (n=78,677), *L. rhomboides* (n=26,759), *Harengula jaguana* (n=23,878), *Anchoa cubana* (n=17,349), and *Eucinostomus* spp. (n=16,439) were the most abundant taxa, accounting for 79.8% of the 21.3-m bay seine catch (Table TB13-02). The taxa most frequently caught in 21.3-m bay seines were *Eucinostomus* spp. (54.4% occurrence), *L. rhomboides* (49.8% occurrence), and *Eucinostomus gula* (35.3% occurrence).

A total of 6,447 animals from 20 Selected Taxa were collected, representing 3.2% of the entire 21.3-m bay seine catch (Table TB13-03). *Leiostomus xanthurus* (n=2,274), *S. ocellatus* (n=1,447), and *Farfantepenaeus duorarum* (n=1,058) were the most abundant Selected Taxa, accounting for 74.1% of the Selected Taxa collected by this gear. The Selected Taxon most frequently caught in 21.3-m bay seines was *F. duorarum* (35.0% occurrence).

183-m Haul Seines. A total of 71,875 animals were collected in 240 183-m haul seines, representing 12.4% of the overall SRS catch (Table TB13-01). *Lagodon rhomboides* (n=31,654) and *H. jaguana* (n=16,372) were the most abundant taxa, accounting for 66.8% of the 183-m haul seine catch. *Eucinostomus gula* (n=4,365) was the next most abundant taxon collected, accounting for an additional 6.1% of the 183-m haul seine catch (Table TB13-04). The taxon most frequently caught in 183-m haul seines was *L. rhomboides* (77.9% occurrence).

A total of 8,646 animals from 23 Selected Taxa were collected, representing 12.0% of the entire 183-m haul seine catch (Table TB13-05). *Elops saurus* (n=2,569), *C. undecimalis* (n=1,236), and *L. xanthurus* (n=1,119) were the most abundant Selected Taxa, accounting for 57.0% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 183-m haul seines were *Archosargus probatocephalus* (60.4% occurrence), *M. cephalus* (51.3% occurrence), and *C. undecimalis* (47.1% occurrence).

6.1-m Bay Otter Trawls. A total of 32,892 animals were collected in 180 6.1-m bay otter trawls, representing 5.7% of the overall SRS catch (Table TB13-01). *Anchoa mitchilli* (n=10,599), *L. rhomboides* (n=5,169), and *A. cubana* (n=4,999) were the most abundant taxa, accounting for 63.1% of the 6.1-m bay otter trawl catch (Table TB13-06). The taxa most frequently caught in 6.1-m bay otter trawls were *Prionotus scitulus* (62.2% occurrence), *Portunus* spp. (38.3% occurrence), and *L. rhomboides* (33.9% occurrence).

A total of 1,790 animals from 14 Selected Taxa were collected, representing 5.4% of the entire 6.1-m bay otter trawl catch (Table TB13-07). *Callinectes sapidus* (n=511), *F. duorarum* (n=317), and *Menticirrhus americanus* (n=303) were the most abundant Selected Taxa, accounting for 63.2% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 6.1-m bay otter trawls were *F. duorarum* (37.2% occurrence) and *Paralichthys albigutta* (33.9% occurrence).

River Sampling

21.3-m River Seines. A total of 214,914 animals were collected in 312 21.3-m river seines, representing 37.1% of the overall SRS catch (Table TB13-01). *Anchoa mitchilli* (n=172,119) was the most abundant species collected, accounting for 80.1% of the 21.3-m river seine catch (Table TB13-08). *Eucinostomus* spp. (n=13,612), *Menidia* spp. (n=7,808), and *Eucinostomus harengulus* (n=4,172) were the next most abundant taxa, accounting for an additional 11.9% of the 21.3-m river seine catch. The taxa most frequently caught in 21.3-m river seines were *Eucinostomus* spp. (81.7% occurrence), *E. harengulus* (68.3% occurrence), *Menidia* spp. (61.2% occurrence), and *L. rhomboides* (54.5% occurrence).

A total of 2,692 animals from 15 Selected Taxa were collected, representing 1.3% of the entire 21.3-m river seine catch (Table TB13-09). *Centropomus undecimalis* (n=844) was the most abundant Selected Taxon, accounting for 31.4% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m river seines were *C. undecimalis* (39.7% occurrence) and *F. duorarum* (29.2% occurrence).

6.1-m River Otter Trawls. A total of 54,947 animals were collected in 156 6.1-m river otter trawls, representing 9.5% of the overall SRS catch (Table TB13-01). *Anchoa mitchilli* (n=45,850) was the most abundant taxon collected, accounting for 83.4% of the 6.1-m river otter trawl catch (Table TB13-10). The taxon most frequently caught in 6.1-m river otter trawls was *C. sapidus* (67.3% occurrence).

A total of 3,027 animals from 15 Selected Taxa were collected, representing 5.5% of the entire 6.1-m river otter trawl catch (Table TB13-11). *Cynoscion arenarius* (n=1,375), *C. sapidus* (n=645), *M. americanus* (n=364), and *F. duorarum* (n=349) were the most abundant Selected Taxa, accounting for 90.3% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in the 6.1-m river otter trawls were *C. sapidus* (67.3% occurrence) and *F. duorarum* (42.9% occurrence).

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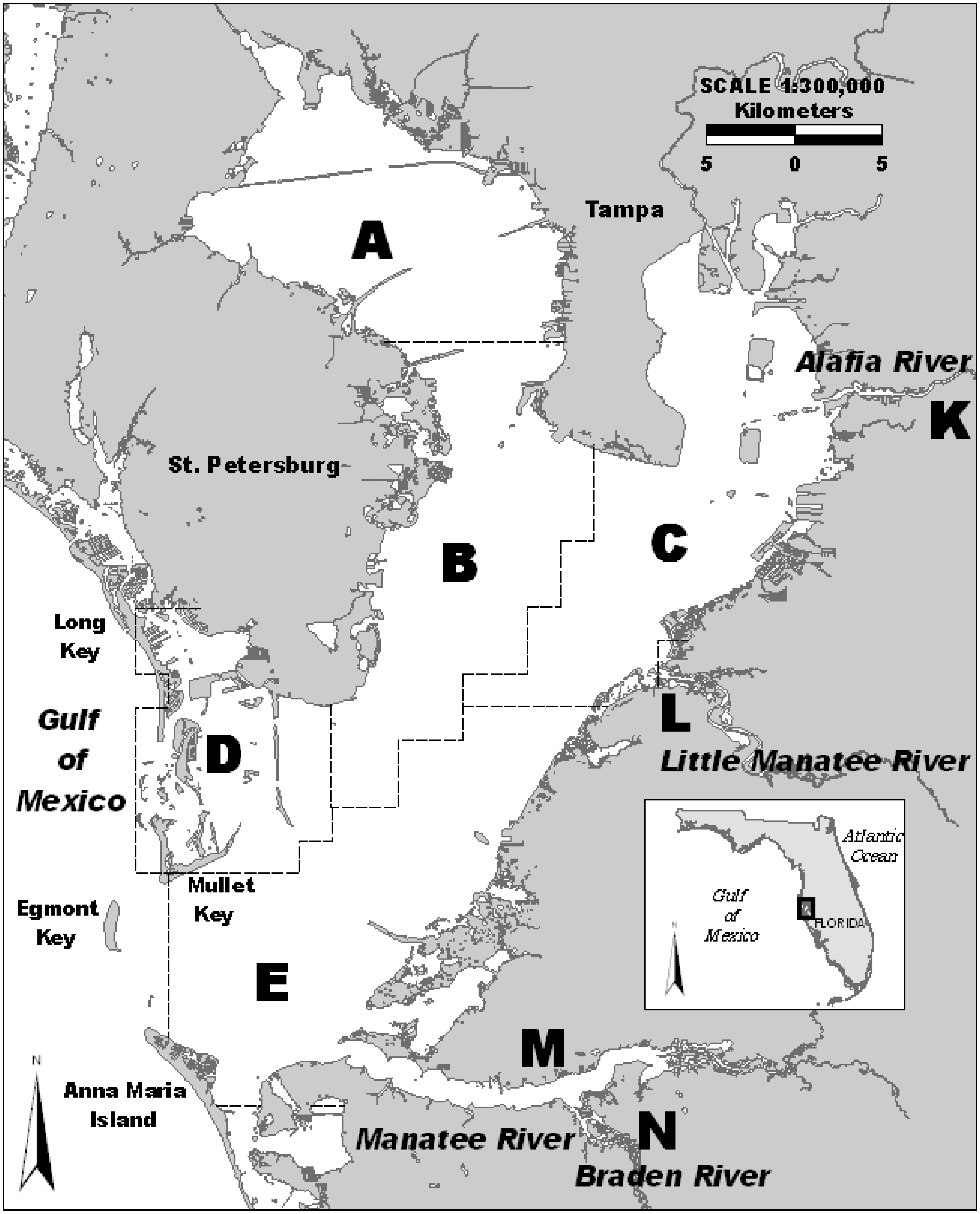

Figure TB13-01. Map of Tampa Bay sampling area. Zones are labeled A-E and K-N.

Table TB13-01. Summary of catch and effort data for Tampa Bay stratified-random sampling, 2013.

Zone	21.3-m bay seine		21.3-m river seine		183-m haul seine		6.1-m otter trawl		Totals	
	Animals	**Hauls**	**Animals**	**Hauls**	**Animals**	**Hauls**	**Animals**	**Hauls**	**Animals**	**Hauls**
A	29,388	84	.	.	23,576	48	2,873	36	55,837	168
B	15,875	72	.	.	11,392	48	3,214	36	30,481	156
C	35,594	108	.	.	5,563	48	6,693	48	47,850	204
D	62,950	60	.	.	11,680	36	9,976	24	84,606	120
E	60,504	84	.	.	19,664	60	10,136	36	90,304	180
K	.	.	78,984	72	.	.	14,738	24	93,722	96
L	.	.	57,989	108	.	.	32,424	72	90,413	180
M	.	.	42,311	72	.	.	4,095	36	46,406	108
N	.	.	35,630	60	.	.	3,690	24	39,320	84
Totals	**204,311**	**408**	**214,914**	**312**	**71,875**	**240**	**87,839**	**336**	**578,939**	**1,296**

Table TB13-02. Catch statistics for 10 dominant taxa collected in 408 21.3-m bay seine samples during Tampa Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	78,677	38.5	20.6	137.74	43.09	631.92	9,282.86	29	0.02	12	56
Lagodon rhomboides	26,759	13.1	49.8	46.85	8.68	374.46	2,560.00	32	0.09	7	155
Harengula jaguana	23,878	11.7	13.5	41.80	20.71	1,000.91	7,748.57	46	0.07	18	132
Anchoa cubana	17,349	8.5	1.0	30.37	22.43	1,491.93	8,091.43	38	0.03	29	46
Eucinostomus spp.	16,439	8.1	54.4	28.78	3.31	232.36	547.86	26	0.05	10	41
Lucania parva	8,418	4.1	14.7	14.74	5.48	751.57	1,695.00	25	0.04	14	36
Menidia spp.	7,088	3.5	17.2	12.41	3.60	586.27	976.43	39	0.09	15	104
Eucinostomus gula	4,540	2.2	35.3	7.95	1.30	330.53	328.57	53	0.14	40	105
Leiostomus xanthurus	2,274	1.1	13.5	3.98	1.18	598.26	310.71	29	0.27	12	98
Opisthonema oglinum	2,041	1.0	3.9	3.57	3.15	1,779.20	1,280.00	44	0.14	27	92
Subtotal	187,463	91.8	.	.	.	.	.	.	.	7	155
Totals	**204,311**	**100.0**	**.**	**357.69**	**65.85**	**371.87**	**14,450.71**	**.**	**.**	**2**	**583**

Table TB13-03. Catch statistics for Selected Taxa collected in 408 21.3-m bay seine samples during Tampa Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Leiostomus xanthurus	2,274	1.1	13.5	3.98	1.18	598.26	310.71	29	0.27	12	98
Sciaenops ocellatus	1,447	0.7	9.8	2.53	1.50	1,195.91	601.43	37	0.53	8	361
Farfantepenaeus duorarum	1,058	0.5	35.0	1.85	0.32	349.55	82.86	8	0.11	2	22
Mugil cephalus	358	0.2	4.2	0.63	0.41	1,312.51	134.29	23	0.25	18	94
Cynoscion nebulosus	336	0.2	16.7	0.59	0.12	423.19	27.14	34	0.80	10	147
Mugil trichodon	291	0.1	3.7	0.51	0.41	1,644.69	168.57	19	0.94	13	151
Callinectes sapidus	197	0.1	19.4	0.34	0.06	349.32	15.00	28	1.68	6	160
Paralichthys albigutta	134	0.1	14.0	0.23	0.05	451.76	15.00	54	4.22	11	306
Menticirrhus americanus	78	<0.1	3.4	0.14	0.07	1,100.97	24.29	23	0.64	10	52
Archosargus probatocephalus	72	<0.1	7.8	0.13	0.03	503.48	9.29	54	7.32	14	303
Centropomus undecimalis	50	<0.1	3.4	0.09	0.04	953.63	13.57	84	13.25	14	389
Lutjanus griseus	48	<0.1	5.1	0.08	0.02	523.45	3.57	60	7.13	16	157
Cynoscion arenarius	26	<0.1	2.0	0.05	0.02	881.20	5.71	27	2.75	13	68
Trachinotus falcatus	22	<0.1	1.0	0.04	0.03	1,666.92	12.86	49	3.89	19	90
Lutjanus synagris	19	<0.1	2.0	0.03	0.02	940.76	5.00	38	3.27	17	62
Menticirrhus saxatilis	17	<0.1	2.5	0.03	0.01	696.64	2.14	35	4.12	16	74
Mugil curema	14	<0.1	1.2	0.02	0.02	1,255.35	5.71	59	4.66	23	89
Elops saurus	2	<0.1	0.5	<0.01	<0.01	1,426.53	0.71	251	20.50	230	271
Scomberomorus maculatus	2	<0.1	0.5	<0.01	<0.01	1,426.53	0.71	76	39.00	37	115
Penaeidae sp.	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	5	.	5	5
Mycteroperca microlepis	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	130	.	130	130
Totals	**6,447**	**3.2**	**.**	**11.29**	**2.12**	**380.09**	**617.14**	**.**	**.**	**2**	**389**

Table TB13-04. Catch statistics for 10 dominant taxa collected in 240 183-m haul seine samples during Tampa Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	31,654	44.0	77.9	131.89	16.23	190.62	2,114.00	101	0.17	25	195
Harengula jaguana	16,372	22.8	17.1	68.22	62.95	1,429.53	15,104.00	101	0.06	45	159
Eucinostomus gula	4,365	6.1	57.5	18.19	3.51	298.66	498.00	82	0.20	40	162
Orthopristis chrysoptera	2,659	3.7	28.3	11.08	3.09	432.39	555.00	110	0.57	41	210
Elops saurus	2,569	3.6	37.1	10.70	5.73	829.20	1,332.00	263	0.62	118	426
Eucinostomus harengulus	2,215	3.1	45.0	9.23	1.83	307.35	325.00	92	0.26	45	134
Ariopsis felis	1,422	2.0	23.3	5.93	1.73	452.79	266.00	281	0.97	161	381
Centropomus undecimalis	1,236	1.7	47.1	5.15	0.85	256.09	91.00	411	3.57	171	935
Leiostomus xanthurus	1,119	1.6	23.8	4.66	1.13	376.81	182.00	94	0.86	42	233
Strongylura notata	1,116	1.6	56.7	4.65	1.08	359.74	198.00	341	0.95	160	501
Subtotal	64,727	90.1	.	.	.	.	.	.	.	25	935
Totals	**71,875**	**100.0**	**.**	**299.48**	**65.30**	**337.77**	**15,142.00**	**.**	**.**	**11**	**1,112**

Table TB13-05. Catch statistics for Selected Taxa collected in 240 183-m haul seine samples during Tampa Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Elops saurus	2,569	3.6	37.1	10.70	5.73	829.20	1,332.00	263	0.62	118	426
Centropomus undecimalis	1,236	1.7	47.1	5.15	0.85	256.09	91.00	411	3.57	171	935
Leiostomus xanthurus	1,119	1.6	23.8	4.66	1.13	376.81	182.00	94	0.86	42	233
Mugil cephalus	931	1.3	51.3	3.88	0.93	370.05	196.00	300	2.07	100	462
Archosargus probatocephalus	909	1.3	60.4	3.79	0.57	232.29	76.00	196	2.28	52	552
Sciaenops ocellatus	333	0.5	37.1	1.39	0.24	268.09	43.00	350	8.22	52	675
Lutjanus griseus	265	0.4	22.1	1.10	0.22	309.57	31.00	143	2.15	71	261
Mugil curema	188	0.3	20.4	0.78	0.20	391.58	28.00	181	3.51	108	295
Cynoscion nebulosus	184	0.3	20.4	0.77	0.20	401.18	35.00	217	5.87	51	455
Callinectes sapidus	178	0.3	22.9	0.74	0.14	302.62	19.00	91	3.00	32	187
Mugil trichodon	152	0.2	20.4	0.63	0.14	332.79	19.00	171	3.41	70	310
Cynoscion arenarius	135	0.2	2.5	0.56	0.48	1,334.69	116.00	218	2.69	100	286
Paralichthys albigutta	126	0.2	26.3	0.53	0.11	315.05	22.00	151	8.29	45	381
Pogonias cromis	119	0.2	9.2	0.50	0.18	569.84	35.00	270	4.97	166	445
Lutjanus synagris	74	0.1	5.8	0.31	0.13	678.23	28.00	101	2.25	68	174
Farfantepenaeus duorarum	41	0.1	8.3	0.17	0.05	460.63	8.00	21	0.81	11	32
Menticirrhus americanus	30	<0.1	3.3	0.13	0.06	746.76	12.00	217	7.66	122	303
Scomberomorus maculatus	22	<0.1	4.6	0.09	0.03	573.20	5.00	277	12.46	162	435
Mycteroperca microlepis	14	<0.1	2.9	0.06	0.03	711.61	5.00	176	12.81	106	305
Trachinotus carolinus	13	<0.1	2.1	0.05	0.03	879.94	6.00	264	15.68	108	324
Trachinotus falcatus	5	<0.1	1.3	0.02	0.01	926.05	2.00	201	44.80	133	375
Pomatomus saltatrix	2	<0.1	0.8	0.01	0.01	1,093.15	1.00	392	29.00	363	421
Albula vulpes	1	<0.1	0.4	<0.01	<0.01	1,549.19	1.00	170	.	170	170
Totals	**8,646**	**12.0**	**.**	**36.03**	**6.52**	**280.51**	**1,456.00**	**.**	**.**	**11**	**935**

Table TB13-06. Catch statistics for 11 dominant taxa collected in 180 6.1-m bay otter trawl samples during Tampa Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	10,599	32.2	13.9	4.02	1.62	539.79	207.13	30	0.08	14	56
Lagodon rhomboides	5,169	15.7	33.9	1.99	1.10	741.24	148.07	44	0.38	14	160
Anchoa cubana	4,999	15.2	2.8	1.88	1.47	1,050.96	258.90	36	0.06	23	48
Harengula jaguana	1,934	5.9	4.4	0.76	0.75	1,320.22	135.06	23	0.19	19	133
Anchoa lyolepis	1,477	4.5	1.1	0.55	0.55	1,340.68	99.57	36	0.09	31	45
Eucinostomus spp.	1,414	4.3	13.9	0.54	0.38	945.84	65.16	20	0.12	11	39
Orthopristis chrysoptera	996	3.0	24.4	0.38	0.13	451.11	14.10	70	1.35	14	202
Portunus spp.	881	2.7	38.3	0.34	0.08	319.56	8.17	38	0.31	11	68
Prionotus scitulus	559	1.7	62.2	0.22	0.03	167.54	2.20	69	1.55	20	180
Callinectes sapidus	511	1.6	27.8	0.20	0.05	308.64	4.05	76	1.61	8	163
Eucinostomus gula	514	1.6	22.8	0.20	0.06	426.73	8.97	80	0.76	40	134
Subtotal	29,053	88.3	.	.	.	.	.	.	.	8	202
Totals	**32,892**	**100.0**	**.**	**12.53**	**3.98**	**425.67**	**519.93**	**.**	**.**	**3**	**673**

Table TB13-07. Catch statistics for Selected Taxa collected in 180 6.1-m bay otter trawl samples during Tampa Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Callinectes sapidus	511	1.6	27.8	0.20	0.05	308.64	4.05	76	1.61	8	163
Farfantepenaeus duorarum	317	1.0	37.2	0.12	0.03	285.88	2.77	16	0.38	3	49
Menticirrhus americanus	303	0.9	22.8	0.12	0.05	542.46	6.34	30	1.67	10	310
Cynoscion arenarius	228	0.7	14.4	0.09	0.03	450.60	4.11	34	2.90	11	235
Paralichthys albigutta	129	0.4	33.9	0.05	0.01	189.87	0.57	180	5.86	38	337
Menippe spp.	121	0.4	18.9	0.05	0.02	468.51	2.32	24	1.46	4	88
Lutjanus synagris	73	0.2	12.2	0.03	0.01	428.44	1.15	94	3.53	19	149
Leiostomus xanthurus	31	0.1	4.4	0.01	0.01	670.26	0.92	55	11.32	10	156
Sciaenops ocellatus	22	0.1	2.2	0.01	0.01	949.92	0.92	13	0.29	11	15
Archosargus probatocephalus	19	0.1	3.3	0.01	0.00	715.54	0.61	40	12.71	14	201
Lutjanus griseus	16	0.1	2.2	0.01	0.00	750.40	0.43	99	9.26	67	185
Cynoscion nebulosus	15	0.1	3.3	0.01	0.00	792.11	0.57	48	17.13	18	286
Micropogonias undulatus	4	<0.1	0.6	<0.01	<0.01	1,341.64	0.27	75	9.34	48	89
Mycteroperca microlepis	1	<0.1	0.6	<0.01	<0.01	1,341.64	0.07	24	.	24	24
Totals	**1,790**	**5.4**	**.**	**0.69**	**0.11**	**221.08**	**11.32**	**.**	**.**	**3**	**337**

Table TB13-08. Catch statistics for 10 dominant taxa collected in 312 21.3-m river seine samples during Tampa Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	172,119	80.1	50.6	811.27	215.36	468.91	57,017.65	28	0.01	10	63
Eucinostomus spp.	13,612	6.3	81.7	64.16	7.93	218.33	1,648.53	27	0.05	10	42
Menidia spp.	7,808	3.6	61.2	36.80	7.78	373.31	1,482.35	37	0.10	14	80
Eucinostomus harengulus	4,172	1.9	68.3	19.66	2.55	228.86	480.88	61	0.22	40	120
Lagodon rhomboides	1,839	0.9	54.5	8.67	1.18	240.75	194.12	39	0.47	11	182
Brevoortia spp.	1,682	0.8	6.1	7.93	3.26	725.37	782.35	46	0.29	17	79
Eugerres plumieri	1,625	0.8	39.4	7.66	1.46	336.38	342.65	40	0.66	11	184
Harengula jaguana	1,484	0.7	3.5	6.99	5.12	1,292.56	1,467.65	63	0.36	14	104
Eucinostomus gula	1,167	0.5	23.4	5.50	1.17	374.52	220.59	59	0.40	40	99
Trinectes maculatus	1,047	0.5	32.7	4.93	1.22	435.88	248.53	20	0.19	8	55
Subtotal	206,555	96.1	.	.	.	.	.	.	.	8	184
Totals	**214,914**	**100.0**	**.**	**1,012.98**	**216.51**	**377.53**	**57,477.94**	**.**	**.**	**2**	**644**

Table TB13-09. Catch statistics for Selected Taxa collected in 312 21.3-m river seine samples during Tampa Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Centropomus undecimalis	844	0.4	39.7	3.98	0.65	287.88	107.35	72	2.51	12	480
Sciaenops ocellatus	425	0.2	20.2	2.00	0.44	389.26	67.65	34	1.92	10	486
Leiostomus xanthurus	342	0.2	10.9	1.61	0.59	644.40	142.65	33	0.91	12	128
Farfantepenaeus duorarum	226	0.1	29.2	1.07	0.15	247.09	25.00	7	0.23	2	24
Callinectes sapidus	208	0.1	24.0	0.98	0.14	255.64	19.12	24	1.78	6	156
Archosargus probatocephalus	179	0.1	21.5	0.84	0.16	343.28	27.94	70	5.16	14	325
Cynoscion arenarius	107	0.1	6.4	0.50	0.24	840.55	66.18	40	1.64	11	76
Mugil cephalus	101	0.1	5.8	0.48	0.21	763.60	41.18	61	5.52	20	396
Mugil trichodon	81	<0.1	3.5	0.38	0.28	1,303.94	86.76	63	2.07	14	123
Cynoscion nebulosus	69	<0.1	9.6	0.33	0.07	383.53	8.82	41	3.24	16	156
Lutjanus griseus	44	<0.1	8.3	0.21	0.05	458.09	11.76	98	7.66	25	185
Menticirrhus americanus	43	<0.1	2.6	0.20	0.14	1,180.39	41.18	35	1.71	14	77
Paralichthys albigutta	12	<0.1	3.2	0.06	0.02	581.16	2.94	129	23.08	41	291
Mugil curema	5	<0.1	1.0	0.02	0.02	1,169.27	4.41	62	18.38	33	126
Elops saurus	4	<0.1	1.3	0.02	0.01	878.91	1.47	99	31.63	40	163
Penaeidae spp.	2	<0.1	0.3	0.01	0.01	1,766.35	2.94	6	0.50	5	6
Totals	**2,692**	**1.3**	**.**	**12.69**	**1.30**	**181.42**	**248.53**	**.**	**.**	**2**	**486**

Table TB13-10. Catch statistics for 10 dominant taxa collected in 156 6.1-m river otter trawl samples during Tampa Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	45,850	83.4	40.4	40.69	12.55	385.28	1,090.80	25	0.03	14	55
Eucinostomus spp.	2,550	4.6	41.7	2.30	0.85	460.87	122.10	19	0.13	9	39
Cynoscion arenarius	1,375	2.5	26.3	1.19	0.76	800.70	117.24	26	0.43	9	200
Trinectes maculatus	879	1.6	40.4	0.78	0.16	250.26	12.28	37	0.48	10	99
Callinectes sapidus	645	1.2	67.3	0.57	0.11	232.49	12.14	86	1.72	6	225
Lagodon rhomboides	627	1.1	27.6	0.56	0.33	724.92	49.38	23	0.70	12	157
Bairdiella chrysoura	632	1.2	14.7	0.55	0.35	809.77	39.94	66	0.69	9	161
Menticirrhus americanus	364	0.7	14.1	0.32	0.22	880.65	34.81	31	1.16	9	297
Farfantepenaeus duorarum	349	0.6	42.9	0.32	0.07	296.04	7.29	10	0.18	3	28
Eugerres plumieri	287	0.5	17.3	0.25	0.07	333.79	6.45	38	1.11	10	108
Subtotal	53,558	97.5	.	.	.	.	.	.	.	3	297
Totals	**54,947**	**100.0**	**.**	**48.76**	**13.03**	**333.68**	**1,094.58**	**.**	**.**	**3**	**1,030**

Table TB13-11. Catch statistics for Selected Taxa collected in 156 6.1-m river otter trawl samples during Tampa Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Cynoscion arenarius	1,375	2.5	26.3	1.19	0.76	800.70	117.24	26	0.43	9	200
Callinectes sapidus	645	1.2	67.3	0.57	0.11	232.49	12.14	86	1.72	6	225
Menticirrhus americanus	364	0.7	14.1	0.32	0.22	880.65	34.81	31	1.16	9	297
Farfantepenaeus duorarum	349	0.6	42.9	0.32	0.07	296.04	7.29	10	0.18	3	28
Sciaenops ocellatus	75	0.1	7.7	0.07	0.03	506.29	2.97	18	1.13	7	57
Archosargus probatocephalus	75	0.1	21.8	0.07	0.01	275.49	1.08	112	6.05	12	238
Centropomus undecimalis	47	0.1	3.2	0.04	0.03	927.10	4.59	22	1.26	15	74
Cynoscion nebulosus	28	0.1	8.3	0.03	0.01	472.77	1.08	33	6.02	11	189
Paralichthys albigutta	26	0.1	9.6	0.02	0.01	393.71	0.75	162	11.43	51	254
Lutjanus griseus	17	<0.1	6.4	0.02	0.01	447.50	0.60	145	5.73	95	184
Leiostomus xanthurus	11	<0.1	3.8	0.01	0.01	711.01	0.81	45	15.79	14	181
Pogonias cromis	8	<0.1	2.6	0.01	<0.01	727.77	0.54	239	11.22	196	296
Elops saurus	5	<0.1	1.9	<0.01	<0.01	834.76	0.45	249	14.14	221	285
Menippe sp.	1	<0.1	0.6	<0.01	<0.01	1,249.00	0.13	71	.	71	71
Lutjanus synagris	1	<0.1	0.6	<0.01	<0.01	1,249.00	0.13	57	.	57	57
Totals	**3,027**	**5.5**	**.**	**2.67**	**1.04**	**487.39**	**159.88**	**.**	**.**	**3**	**297**

Appendix TB13-01. Monthly summary of species collected during Tampa Bay stratified-random sampling, 2013. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	**Month**												**Totals**
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=108	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=1,296**
Acanthostracion quadricornis	14	6	2	11	9	21	9	31	24	48	27	15	217
Achirus lineatus	10	6	.	2	12	8	24	21	26	38	15	9	171
Adinia xenica	1	1	.	.	.	.	.	.	81	.	212	.	295
Aetobatus narinari	.	.	.	.	.	.	.	.	1	.	.	.	1
Albula vulpes	.	1	.	.	.	.	.	.	.	.	.	.	1
Aluterus schoepfii	.	.	.	.	.	6	3	1	2	.	.	.	12
Ameiurus catus	.	.	.	.	.	1	23	17	.	.	.	.	41
Anarchopterus criniger	.	.	.	.	.	.	1	.	.	.	.	.	1
Anchoa cubana	4,589	2	1	.	.	.	1	.	11,736	6,018	.	1	22,348
Anchoa hepsetus	1	.	.	33	162	142	323	383	36	2	6	15	1,103
Anchoa lyolepis	1,476	.	1	.	.	.	.	.	5	1,024	.	.	2,506
Anchoa mitchilli	24,805	45,254	6,005	3,677	14,833	17,624	21,115	38,926	26,826	44,194	25,792	38,194	307,245
Anchoa spp.	.	.	.	.	34	.	.	.	.	.	.	.	34
Ancylopsetta quadrocellata	1	.	1	.	.	.	.	.	.	.	1	.	3
Archosargus probatocephalus	89	83	82	41	133	107	116	121	153	119	171	39	1,254
Argopecten spp.	.	.	.	.	1	.	.	1	.	.	1	.	3
Ariopsis felis	12	127	199	50	124	393	328	8	122	132	92	53	1,640
Astroscopus y-graecum	.	.	.	1	.	.	.	.	.	.	.	.	1
Bagre marinus	.	9	.	4	3	18	10	3	16	4	.	3	70
Bairdiella chrysoura	5	6	17	38	704	909	645	768	217	55	61	92	3,517
Bathygobius soporator	1	6	5	.	.	.	.	.	.	1	9	1	23
Belonesox belizanus	.	2	.	.	.	.	1	.	5	.	11	.	19
Brevoortia spp.	14	104	10	268	484	760	119	14	11	1	.	.	1,785
Calamus arctifrons	.	.	2	.	24	.	9	4	5	23	.	2	69

Appendix TB13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=1,296
Calamus penna	1	.	.	.	3	.	.	.	.	.	2	.	6
Calamus spp.	4	.	1	.	.	.	.	.	.	.	1	2	8
Callinectes ornatus	.	6	.	.	.	3	1	.	.	.	.	.	10
Callinectes sapidus	166	262	222	265	165	275	162	80	28	37	36	41	1,739
Callinectes sp.	.	.	.	.	.	.	.	.	.	.	.	1	1
Caranx crysos	.	1	.	1	2	.	.	.	.	1	4	11	20
Caranx hippos	8	.	.	14	1	9	9	14	5	6	11	6	83
Caranx latus	1	.	.	.	.	1	.	.	1	.	.	.	3
Centropomus undecimalis	213	168	75	174	66	81	118	185	362	233	287	215	2,177
Centropristis striata	2	1	3	11	13	9	9	11	9	4	5	2	79
Chaetodipterus faber	31	.	18	1	6	13	29	12	16	3	2	1	132
Chasmodes saburrae	2	1	3	4	3	2	18	3	.	16	8	19	79
Chilomycterus schoepfii	20	10	14	14	19	8	26	22	24	18	25	45	245
Chloroscombrus chrysurus	.	.	.	3	.	.	3	4	48	7	.	.	65
Citharichthys macrops	10	6	.	9	2	.	1	1	.	1	.	1	31
Clupeidae spp.	.	.	.	3	.	.	.	.	.	.	.	.	3
Ctenogobius boleosoma	.	4	1	.	.	.	.	.	.	.	.	.	5
Cynoscion arenarius	2	9	119	2	202	100	115	201	970	131	11	9	1,871
Cynoscion nebulosus	11	40	39	5	59	113	129	71	99	35	12	19	632
Cyprinodon variegatus	33	.	119	2	1	38	27	71	6	1	73	159	530
Dasyatis americana	.	3	.	.	2	2	2	.	.	1	.	.	10
Dasyatis sabina	24	72	29	73	40	80	65	38	46	32	55	21	575
Dasyatis say	1	1	.	2	4	4	4	3	.	3	1	1	24
Dasyatis spp.	.	.	.	.	.	.	.	1	1	.	1	.	3
Diapterus auratus	.	.	.	.	.	.	.	.	.	.	2	34	36
Diplectrum formosum	1	2	.	2	.	.	.	.	.	1	.	.	6

Appendix TB13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=1,296
Diplodus holbrookii	.	.	.	37	17	25	8	67	72	23	17	28	294
Dorosoma petenense	.	.	5	.	.	1	.	2	.	1	.	.	9
Echeneis neucratoides	.	.	1	.	2	.	.	.	.	1	.	.	4
Elacatinus macrodon	.	.	.	.	.	7	.	.	.	.	.	.	7
Elops saurus	25	368	1,468	55	11	93	86	21	36	52	130	235	2,580
Elops smithi	.	.	1	.	.	.	.	.	.	.	.	.	1
Elops sp.	.	.	.	1	.	.	.	.	.	.	.	.	1
Etropus crossotus	8	10	3	5	.	1	2	1	4	6	3	9	52
Eucinostomus gula	996	1,226	345	937	774	345	1,244	1,081	1,105	747	648	1,189	10,637
Eucinostomus harengulus	655	617	453	941	1,844	571	251	513	554	485	392	429	7,705
Eucinostomus spp.	1,837	2,269	989	1,108	253	3,251	2,904	4,345	2,952	4,008	5,591	4,510	34,017
Eugerres plumieri	82	147	23	77	88	605	482	233	248	84	145	84	2,298
Farfantepenaeus duorarum	336	161	117	53	22	78	245	239	270	253	132	85	1,991
Fistularia tabacaria	.	.	.	1	.	.	.	.	.	.	.	.	1
Floridichthys carpio	50	59	78	157	7	42	512	47	110	31	82	191	1,366
Fundulus confluentus	.	1	.	.	.	.	.	.	5	.	197	.	203
Fundulus grandis	132	69	33	1	.	5	55	44	88	29	180	.	636
Fundulus seminolis	6	.	.	.	.	.	.	19	1	18	.	2	46
Fundulus similis	5	92	42	10	261	3	277	190	2	151	2	117	1,152
Gambusia holbrooki	3	52	1	.	.	.	.	3	3	11	218	1	292
Gobiesox strumosus	2	.	1	1	7	.	.	1	.	.	.	6	18
Gobionellus oceanicus	.	.	.	.	.	.	.	2	.	.	.	.	2
Gobiosoma bosc	28	53	23	3	2	15	7	3	12	4	25	12	187
Gobiosoma longipala	.	2	.	.	.	.	.	1	3	3	.	.	9
Gobiosoma robustum	41	45	73	16	3	10	27	5	7	1	13	3	244
Gobiosoma spp.	12	9	12	.	27	37	59	21	33	8	12	12	242

Appendix TB13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=1,296
Gymnura micrura	1	3	1	.	1	5	6	1	.	.	2	1	21
Haemulon plumierii	.	.	.	1	1	.	.	1	6	7	1	8	25
Harengula jaguana	6	26	30	31	17,031	3,209	214	14,015	6,536	656	1,228	686	43,668
Hemicaranx amblyrhynchus	.	.	.	.	.	.	1	.	5	.	.	.	6
Hippocampus erectus	1	3	1	9	1	.	1	1	1	2	6	.	26
Hippocampus zosterae	9	7	3	2	2	1	.	.	1	.	2	1	28
Hypleurochilus caudovittatus	.	1	.	.	.	.	.	.	.	.	.	1	2
Hyporhamphus meeki	2	1	3	.	3	6	3	3	.	2	.	8	31
Hyporhamphus spp.	.	.	.	.	.	4	.	2	.	.	.	.	6
Hypsoblennius hentz	.	1	.	.	.	.	.	1	.	.	1	2	5
Ictalurus punctatus	.	.	.	.	.	.	8	.	1	.	.	.	9
Labidesthes sicculus	.	.	.	.	.	.	.	.	.	.	2	.	2
Lachnolaimus maximus	.	.	.	.	.	.	.	.	1	.	.	.	1
Lagodon rhomboides	1,778	6,288	5,968	10,767	6,099	8,695	5,596	8,408	5,979	1,658	1,817	2,995	66,048
Leiostomus xanthurus	524	1,260	665	446	396	206	184	68	10	12	6	.	3,777
Lepisosteus osseus	.	2	3	.	2	2	3	.	4	1	.	1	18
Lepisosteus platyrhincus	.	.	.	.	.	.	.	1	.	.	.	.	1
Lepomis macrochirus	1	1	.	.	.	.	1	1	1	.	2	1	8
Lepomis microlophus	.	3	.	.	.	.	.	.	.	.	2	.	5
Lepomis punctatus	.	.	.	.	.	.	.	.	.	.	2	.	2
Lepomis spp.	.	.	.	.	.	.	.	1	1	.	1	.	3
Limulus polyphemus	.	5	1	14	.	2	4	3	5	6	4	.	44
Lophogobius cyprinoides	1	.	.	1	.	3	2	2	1	1	1	2	14
Loricariidae sp.	.	.	.	.	.	.	.	.	.	.	1	.	1
Lucania parva	185	50	795	112	111	3,557	345	837	2,807	50	100	218	9,167
Lutjanus griseus	7	2	3	10	19	25	41	94	70	81	28	10	390

Appendix TB13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=108	E=1,296
Lutjanus synagris	28	18	1	4	14	10	9	15	23	17	3	25	167
Membras martinica	.	.	2	1	11	28	87	.	1	.	12	.	142
Menidia spp.	203	305	1,831	1,074	1,195	1,252	3,455	2,572	2,238	443	128	201	14,897
Menippe spp.	13	6	4	7	7	3	7	4	4	37	6	24	122
Menticirrhus americanus	2	13	10	1	37	158	82	26	319	134	25	11	818
Menticirrhus saxatilis	.	4	.	2	3	.	.	.	.	.	5	3	17
Microgobius gulosus	167	55	56	63	242	432	412	300	252	239	190	93	2,501
Microgobius thalassinus	.	1	.	2	2	2	2	8	3	.	1	1	22
Micropogonias undulatus	.	.	4	.	.	.	.	.	.	.	.	.	4
Monacanthus ciliatus	.	1	1	.	.	.	.	.	.	.	1	.	3
Mugil cephalus	61	500	372	99	20	146	47	37	43	33	13	19	1,390
Mugil curema	16	31	46	3	5	7	11	7	35	10	25	11	207
Mugil trichodon	47	82	2	7	17	4	6	9	12	2	15	321	524
Mycteroperca microlepis	.	.	.	.	1	.	2	4	8	1	.	.	16
Nicholsina usta	.	3	.	4	61	7	11	1	19	1	.	35	142
Ogcocephalus cubifrons	1	3	.	.	2	1	1	.	.	4	1	.	13
Oligoplites saurus	.	1	.	5	20	89	137	73	61	25	.	4	415
Opisthonema oglinum	13	4	43	195	46	147	21	1,965	87	107	65	61	2,754
Opsanus beta	6	7	6	7	10	20	15	13	7	3	2	2	98
Oreochromis aureus	1	.	.	.	.	.	.	.	.	.	.	.	1
Oreochromis/Sarotherodon spp.	.	.	.	.	.	6	.	.	1	.	1	.	8
Orthopristis chrysoptera	37	425	347	1,092	554	502	450	586	230	468	35	883	5,609
Paraclinus marmoratus	.	.	.	.	4	.	.	.	.	.	.	.	4
Paralichthys albigutta	31	52	59	68	39	49	22	32	21	22	19	13	427
Penaeidae spp.	.	2	.	.	.	.	.	.	.	.	.	1	3
Poecilia latipinna	2	51	7	.	.	3	4	9	478	.	123	3	680

Appendix TB13-01. (Continued)

Species	**Month**												**Totals**
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=108	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=1,296**
Pogonias cromis	.	.	.	7	5	5	4	1	22	44	37	2	127
Pomatomus saltatrix	.	.	.	.	.	.	1	.	.	.	1	.	2
Portunus spp.	72	9	17	7	2	43	79	133	163	113	87	175	900
Prionotus scitulus	93	77	19	42	12	30	35	108	31	54	62	87	650
Prionotus tribulus	18	19	4	6	1	4	.	1	4	24	66	18	165
Rhinobatos lentiginosus	1	.	.	.	.	1	.	.	.	.	.	.	2
Rhinoptera bonasus	1	4	.	1	5	30	1	3	.	.	.	.	45
Rimapenaeus constrictus	4	.	1	.	.	.	6	.	.	1	4	2	18
Sardinella aurita	2	.	.	.	.	.	.	34	6	.	.	.	42
Sarotherodon melanotheron	.	.	.	.	.	3	.	.	9	.	4	.	16
Sciaenops ocellatus	84	44	41	50	18	43	35	23	48	174	503	1,239	2,302
Scomberomorus maculatus	.	.	.	1	4	5	4	3	4	1	1	1	24
Scorpaena brasiliensis	.	.	.	.	1	.	.	.	.	1	.	.	2
Selene vomer	.	.	.	1	3	1	9	9	10	1	9	.	43
Serraniculus pumilio	.	.	.	.	1	.	.	1	.	1	1	.	4
Serranus subligarius	.	.	1	.	.	.	.	.	.	1	.	.	2
Sicyonia laevigata	.	.	1	.	.	.	.	.	.	.	.	.	1
Sicyonia typica	2	.	.	.	.	.	.	.	.	.	.	.	2
Sphoeroides nephelus	32	26	19	23	47	44	28	19	33	17	47	30	365
Sphoeroides spengleri	.	.	.	.	.	.	.	.	.	.	1	.	1
Sphoeroides sp.	.	.	.	.	.	.	.	.	.	.	1	.	1
Sphyraena barracuda	17	3	4	6	7	.	.	3	4	5	8	4	61
Sphyraena borealis	.	.	.	.	3	16	.	.	.	.	.	.	19
Sphyrna tiburo	.	.	.	7	1	3	3	2	1	6	1	.	24
Stephanolepis hispidus	4	5	4	2	29	34	31	26	16	7	6	33	197
Strongylura marina	5	13	3	4	26	6	2	5	33	2	5	23	127

Appendix TB13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=108	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=108**	**E=1,296**
Strongylura notata	71	57	119	63	214	125	120	47	113	133	67	345	1,474
Strongylura spp.	.	.	.	1	7	3	2	1	2	.	1	.	17
Strongylura timucu	.	.	16	2	.	.	.	6	.	1	.	2	27
Symphurus plagiusa	14	11	10	12	11	10	15	2	5	3	5	12	110
Syngnathus floridae	.	2	1	10	75	8	15	1	17	8	7	13	157
Syngnathus louisianae	1	2	.	4	8	9	9	11	11	16	11	9	91
Syngnathus scovelli	16	10	29	33	133	38	33	24	13	9	33	29	400
Synodus foetens	36	33	30	48	58	48	32	68	21	38	50	34	496
Trachinotus carolinus	.	1	1	.	.	.	.	10	.	.	1	.	13
Trachinotus falcatus	.	.	.	4	.	.	.	2	19	1	1	.	27
Trinectes maculatus	127	282	152	17	101	49	210	295	130	233	108	248	1,952
Tylosurus crocodilus	.	.	.	.	.	.	.	.	2	.	.	1	3
Urophycis floridana	1	9	1	1	.	.	.	.	.	.	.	.	12
Totals	**39,510**	**61,197**	**21,373**	**22,492**	**47,157**	**44,955**	**41,468**	**77,791**	**66,374**	**63,021**	**39,725**	**53,876**	**578,939**

Appendix TB13-02. Summary by gear, stratum, and zone of species collected during Tampa Bay stratified-random sampling, 2013. Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or offshore) within 5-m. Offshore sets were further stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 21.3-m river seine and 183-m haul seine was stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Sampling with 6.1-m otter trawl was not stratified. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=116	E=124	E=168	E=169	E=143	E=184	E=56	E=336	E=1,296
Acanthostracion quadricornis	10	2	5	.	.	40	98	62	217
Achirus lineatus	14	7	53	25	3	1	.	68	171
Adinia xenica	.	.	.	1	294	.	.	.	295
Aetobatus narinari	.	.	.	.	.	1	.	.	1
Albula vulpes	.	.	.	.	.	1	.	.	1
Aluterus schoepfii	2	.	.	.	.	2	1	7	12
Ameiurus catus	.	.	.	.	.	.	.	41	41
Anarchopterus criniger	.	.	.	.	.	.	.	1	1
Anchoa cubana	17,347	.	2	.	.	.	.	4,999	22,348
Anchoa hepsetus	64	32	70	263	206	1	.	467	1,103
Anchoa lyolepis	1,024	.	5	.	.	.	.	1,477	2,506
Anchoa mitchilli	34,457	2,103	42,117	64,277	107,842	.	.	56,449	307,245
Anchoa spp.	.	.	.	31	.	.	.	3	34
Ancylopsetta quadrocellata	.	.	.	.	.	.	.	3	3
Archosargus probatocephalus	28	5	39	108	71	640	269	94	1,254
Argopecten spp.	.	.	.	.	.	.	1	2	3
Ariopsis felis	30	30	.	2	5	839	583	151	1,640
Astroscopus y-graecum	.	1	.	.	.	.	.	.	1
Bagre marinus	.	.	.	.	.	58	3	9	70
Bairdiella chrysoura	1,461	28	233	300	139	234	17	1,105	3,517
Bathygobius soporator	.	1	3	5	11	.	1	2	23
Belonesox belizanus	.	.	.	11	8	.	.	.	19
Brevoortia spp.	.	1	17	150	1,532	54	30	1	1,785
Calamus arctifrons	.	1	.	.	.	25	27	16	69
Calamus penna	3	1	.	.	.	2	.	.	6
Calamus spp.	7	.	1	.	.	.	.	.	8
Callinectes ornatus	.	.	9	.	.	.	1	.	10

Appendix TB13-02. (Continued)

Species	**Gear and Strata**								**Totals**
	21.3-m bay seine			**21.3-m river seine**		**183-m haul seine**		**6.1-m otter trawl**	
	Veg	**Unveg**	**Shore**	**Over**	**Nonover**	**Over**	**Nonover**		
	E=116	**E=124**	**E=168**	**E=169**	**E=143**	**E=184**	**E=56**	**E=336**	**E=1,296**
Callinectes sapidus	26	30	141	97	111	159	19	1,156	1,739
Callinectes sp.	.	.	1	.	.	.	.	.	1
Caranx crysos	.	.	.	.	.	13	4	3	20
Caranx hippos	.	.	.	.	.	67	16	.	83
Caranx latus	.	.	.	1	.	1	1	.	3
Centropomus undecimalis	2	3	45	317	527	1,105	131	47	2,177
Centropristis striata	5	.	2	1	.	28	4	39	79
Chaetodipterus faber	5	.	4	.	.	51	25	47	132
Chasmodes saburrae	20	5	44	1	1	2	.	6	79
Chilomycterus schoepfii	25	3	5	.	.	62	20	130	245
Chloroscombrus chrysurus	6	1	1	.	.	.	.	57	65
Citharichthys macrops	.	1	.	.	.	6	6	18	31
Clupeidae spp.	.	.	.	3	.	.	.	.	3
Ctenogobius boleosoma	.	.	5	.	.	.	.	.	5
Cynoscion arenarius	8	12	6	32	75	19	116	1,603	1,871
Cynoscion nebulosus	258	5	73	42	27	172	12	43	632
Cyprinodon variegatus	.	.	420	.	109	.	1	.	530
Dasyatis americana	.	.	.	.	.	4	3	3	10
Dasyatis sabina	8	5	4	2	2	255	148	151	575
Dasyatis say	.	1	.	.	.	13	7	3	24
Dasyatis spp.	.	.	.	.	.	1	.	2	3
Diapterus auratus	.	.	11	3	22	.	.	.	36
Diplectrum formosum	.	.	.	.	.	.	.	6	6
Diplodus holbrookii	63	.	3	.	.	155	62	11	294
Dorosoma petenense	.	.	.	.	4	.	5	.	9
Echeneis neucratoides	.	.	.	.	.	3	1	.	4
Elacatinus macrodon	.	.	.	.	.	.	.	7	7
Elops saurus	.	2	.	2	2	1,136	1,433	5	2,580
Elops smithi	.	1	.	.	.	.	.	.	1
Elops sp.	.	.	.	.	.	.	.	1	1
Etropus crossotus	.	.	1	.	.	3	1	47	52
Eucinostomus gula	1,067	144	3,329	649	518	3,819	546	565	10,637

Appendix TB13-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=116	E=124	E=168	E=169	E=143	E=184	E=56	E=336	E=1,296
Eucinostomus harengulus	15	89	1,009	2,531	1,641	1,980	235	205	7,705
Eucinostomus spp.	5,034	885	10,520	7,826	5,786	2	.	3,964	34,017
Eugerres plumieri	51	8	28	577	1,048	293	6	287	2,298
Farfantepenaeus duorarum	379	46	633	125	101	35	6	666	1,991
Fistularia tabacaria	.	.	.	.	.	.	.	1	1
Floridichthys carpio	18	1	1,213	58	68	5	3	.	1,366
Fundulus confluentus	.	.	.	1	202	.	.	.	203
Fundulus grandis	.	1	223	50	362	.	.	.	636
Fundulus seminolis	.	.	.	20	26	.	.	.	46
Fundulus similis	.	10	835	61	228	10	8	.	1,152
Gambusia holbrooki	.	.	.	266	26	.	.	.	292
Gobiesox strumosus	.	1	8	2	1	.	.	6	18
Gobionellus oceanicus	.	.	.	.	.	.	.	2	2
Gobiosoma bosc	.	3	3	110	61	.	.	10	187
Gobiosoma longipala	.	.	.	.	.	.	.	9	9
Gobiosoma robustum	94	19	107	4	1	.	.	19	244
Gobiosoma spp.	39	17	15	54	60	.	.	57	242
Gymnura micrura	.	.	.	.	.	14	2	5	21
Haemulon plumierii	5	.	.	.	.	12	8	.	25
Harengula jaguana	8,904	318	14,656	1,442	42	1,050	15,322	1,934	43,668
Hemicaranx amblyrhynchus	.	.	.	.	.	.	.	6	6
Hippocampus erectus	4	7	1	.	.	1	.	13	26
Hippocampus zosterae	18	.	8	.	1	.	.	1	28
Hypleurochilus caudovittatus	.	.	.	.	.	.	.	2	2
Hyporhamphus meeki	2	8	.	.	.	9	12	.	31
Hyporhamphus spp.	.	1	4	.	.	.	1	.	6
Hypsoblennius hentz	1	.	.	.	.	.	.	4	5
Ictalurus punctatus	.	.	.	.	.	.	.	9	9
Labidesthes sicculus	.	.	.	.	2	.	.	.	2
Lachnolaimus maximus	.	.	.	.	.	1	.	.	1
Lagodon rhomboides	15,812	613	10,334	1,260	579	26,417	5,237	5,796	66,048
Leiostomus xanthurus	72	239	1,963	286	56	691	428	42	3,777

Appendix TB13-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=116	E=124	E=168	E=169	E=143	E=184	E=56	E=336	E=1,296
Lepisosteus osseus	.	.	.	1	1	5	1	10	18
Lepisosteus platyrhincus	.	.	.	.	.	1	.	.	1
Lepomis macrochirus	.	.	.	7	1	.	.	.	8
Lepomis microlophus	.	.	.	4	1	.	.	.	5
Lepomis punctatus	.	.	.	1	1	.	.	.	2
Lepomis spp.	.	.	.	2	1	.	.	.	3
Limulus polyphemus	1	2	8	1	.	21	5	6	44
Lophogobius cyprinoides	.	.	.	7	2	.	.	5	14
Loricariidae sp.	.	.	.	.	.	.	.	1	1
Lucania parva	2,460	22	5,936	329	342	.	.	78	9,167
Lutjanus griseus	23	.	25	19	25	199	66	33	390
Lutjanus synagris	14	1	4	.	.	63	11	74	167
Membras martinica	27	17	3	31	64	.	.	.	142
Menidia spp.	154	81	6,853	4,269	3,539	.	.	1	14,897
Menippe spp.	.	.	.	.	.	.	.	122	122
Menticirrhus americanus	31	10	37	34	9	23	7	667	818
Menticirrhus saxatilis	7	1	9	.	.	.	.	.	17
Microgobius gulosus	578	325	777	332	254	.	.	235	2,501
Microgobius thalassinus	.	.	.	1	.	.	.	21	22
Micropogonias undulatus	.	.	.	.	.	.	.	4	4
Monacanthus ciliatus	.	.	1	.	.	1	.	1	3
Mugil cephalus	1	1	356	36	65	775	156	.	1,390
Mugil curema	1	.	13	2	3	186	2	.	207
Mugil trichodon	2	2	287	76	5	135	17	.	524
Mycteroperca microlepis	1	.	.	.	.	10	4	1	16
Nicholsina usta	9	.	16	.	.	54	32	31	142
Ogcocephalus cubifrons	.	.	.	.	.	2	2	9	13
Oligoplites saurus	43	41	117	99	52	35	25	3	415
Opisthonema oglinum	233	7	1,801	17	4	486	108	98	2,754
Opsanus beta	4	.	2	6	5	32	11	38	98
Oreochromis aureus	.	.	.	.	.	.	1	.	1
Oreochromis/Sarotherodon spp.	.	.	4	3	1	.	.	.	8

Appendix TB13-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=116	E=124	E=168	E=169	E=143	E=184	E=56	E=336	E=1,296
Orthopristis chrysoptera	1,291	44	485	51	8	1,989	670	1,071	5,609
Paraclinus marmoratus	.	.	.	.	.	.	.	4	4
Paralichthys albigutta	15	52	67	11	1	97	29	155	427
Penaeidae spp.	1	.	.	.	2	.	.	.	3
Poecilia latipinna	.	.	4	108	568	.	.	.	680
Pogonias cromis	.	.	.	.	.	76	43	8	127
Pomatomus saltatrix	.	.	.	.	.	1	1	.	2
Portunus spp.	2	9	3	.	.	.	.	886	900
Prionotus scitulus	6	31	18	3	.	3	9	580	650
Prionotus tribulus	2	17	10	3	5	5	1	122	165
Rhinobatos lentiginosus	.	.	.	.	.	.	.	2	2
Rhinoptera bonasus	.	.	.	.	.	37	7	1	45
Rimapenaeus constrictus	.	6	2	.	.	.	.	10	18
Sardinella aurita	.	.	39	.	.	2	.	1	42
Sarotherodon melanotheron	.	.	3	.	12	1	.	.	16
Sciaenops ocellatus	157	6	1,284	136	289	291	42	97	2,302
Scomberomorus maculatus	1	.	1	.	.	7	15	.	24
Scorpaena brasiliensis	.	.	.	.	.	1	.	1	2
Selene vomer	.	.	.	.	.	38	3	2	43
Serraniculus pumilio	.	.	.	.	.	.	.	4	4
Serranus subligarius	.	.	.	.	.	.	.	2	2
Sicyonia laevigata	.	.	.	.	.	.	.	1	1
Sicyonia typica	1	.	.	.	.	.	.	1	2
Sphoeroides nephelus	40	14	76	2	2	144	65	22	365
Sphoeroides spengleri	.	.	.	.	.	1	.	.	1
Sphoeroides sp.	.	1	.	.	.	.	.	.	1
Sphyraena barracuda	.	.	2	.	.	51	8	.	61
Sphyraena borealis	14	.	1	.	.	.	.	4	19
Sphyrna tiburo	.	.	1	.	.	17	5	1	24
Stephanolepis hispidus	51	1	27	.	.	47	21	50	197
Strongylura marina	3	.	8	23	2	35	56	.	127
Strongylura notata	15	25	206	96	16	841	275	.	1,474

Appendix TB13-02. (Continued)

Species	**Gear and Strata**								**Totals**
	21.3-m bay seine			**21.3-m river seine**		**183-m haul seine**		**6.1-m otter trawl**	
	Veg	**Unveg**	**Shore**	**Over**	**Nonover**	**Over**	**Nonover**		
	E=116	**E=124**	**E=168**	**E=169**	**E=143**	**E=184**	**E=56**	**E=336**	**E=1,296**
Strongylura spp.	.	1	4	10	2	.	.	.	17
Strongylura timucu	.	.	9	18	.	.	.	.	27
Symphurus plagiusa	6	14	20	2	2	2	.	64	110
Syngnathus floridae	47	1	26	.	.	.	.	83	157
Syngnathus louisianae	12	4	21	3	1	.	.	50	91
Syngnathus scovelli	128	20	71	5	9	1	1	165	400
Synodus foetens	47	95	69	21	8	64	18	174	496
Trachinotus carolinus	.	.	.	.	.	5	8	.	13
Trachinotus falcatus	.	.	22	.	.	5	.	.	27
Trinectes maculatus	1	1	12	582	465	5	.	886	1,952
Tylosurus crocodilus	.	.	.	.	.	.	3	.	3
Urophycis floridana	1	.	1	.	.	1	.	9	12
Totals	**91,818**	**5,543**	**106,950**	**87,347**	**127,567**	**45,287**	**26,588**	**87,839**	**578,939**

Appendix TB13-03. Summary by zone of species collected during Tampa Bay stratified-random sampling, 2013. Zones A-E were located in Tampa Bay, while Zones K (Alafia River), L (Little Manatee River), M (Manatee River), and N (Braden River) represent tributaries of Tampa Bay. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Zone									Totals
	A	B	C	D	E	K	L	M	N	
	E=168	E=156	E=204	E=120	E=180	E=96	E=180	E=108	E=84	E=1,296
Acanthostracion quadricornis	7	46	20	76	67	.	.	1	.	217
Achirus lineatus	17	4	60	18	18	15	17	13	9	171
Adinia xenica	.	.	.	.	.	212	81	1	1	295
Aetobatus narinari	.	.	1	.	.	.	.	.	.	1
Albula vulpes	1	.	.	.	.	.	.	.	.	1
Aluterus schoepfii	.	2	.	8	2	.	.	.	.	12
Ameiurus catus	.	.	.	.	.	.	41	.	.	41
Anarchopterus criniger	.	1	.	.	.	.	.	.	.	1
Anchoa cubana	.	409	752	6,019	15,168	.	.	.	.	22,348
Anchoa hepsetus	34	382	81	99	37	281	16	173	.	1,103
Anchoa lyolepis	.	.	1	1,024	1,481	.	.	.	.	2,506
Anchoa mitchilli	16,372	9,609	20,775	29,633	12,887	74,897	72,470	37,074	33,528	307,245
Anchoa spp.	.	.	.	.	.	.	34	.	.	34
Ancylopsetta quadrocellata	.	.	.	2	1	.	.	.	.	3
Archosargus probatocephalus	274	224	126	95	281	46	158	13	37	1,254
Argopecten spp.	.	1	1	.	1	.	.	.	.	3
Ariopsis felis	609	34	739	24	106	43	21	50	14	1,640
Astroscopus y-graecum	.	.	.	1	.	.	.	.	.	1
Bagre marinus	37	.	5	.	22	2	2	2	.	70
Bairdiella chrysoura	562	174	656	615	439	47	888	112	24	3,517
Bathygobius soporator	1	1	2	.	1	7	5	6	.	23
Belonesox belizanus	.	.	.	.	.	4	15	.	.	19
Brevoortia spp.	50	9	27	8	8	1,239	195	18	231	1,785
Calamus arctifrons	.	.	.	59	10	.	.	.	.	69
Calamus penna	.	4	.	2	.	.	.	.	.	6
Calamus spp.	.	2	.	2	4	.	.	.	.	8
Callinectes ornatus	.	.	.	6	4	.	.	.	.	10
Callinectes sapidus	335	37	252	138	124	395	183	222	53	1,739
Callinectes sp.	.	.	.	1	.	.	.	.	.	1
Caranx crysos	.	3	.	1	16	.	.	.	.	20
Caranx hippos	6	9	21	2	45	.	.	.	.	83

Appendix TB13-03. (Continued)

Species	Zone									Totals
	A	B	C	D	E	K	L	M	N	
	E=168	E=156	E=204	E=120	E=180	E=96	E=180	E=108	E=84	E=1,296
Caranx latus	.	.	.	1	1	.	1	.	.	3
Centropomus undecimalis	228	156	201	110	591	398	319	21	153	2,177
Centropristis striata	.	8	13	37	20	.	1	.	.	79
Chaetodipterus faber	8	1	51	1	56	1	3	10	1	132
Chasmodes saburrae	38	4	14	6	13	.	3	1	.	79
Chilomycterus schoepfii	29	20	40	66	85	.	3	2	.	245
Chloroscombrus chrysurus	2	6	48	.	6	2	.	1	.	65
Citharichthys macrops	.	2	.	13	16	.	.	.	.	31
Clupeidae spp.	.	.	.	.	.	.	.	.	3	3
Ctenogobius boleosoma	.	.	.	4	1	.	.	.	.	5
Cynoscion arenarius	71	18	293	7	.	1,133	202	104	43	1,871
Cynoscion nebulosus	211	42	83	65	134	14	58	13	12	632
Cyprinodon variegatus	7	3	22	266	123	79	5	1	24	530
Dasyatis americana	2	1	.	4	3	.	.	.	.	10
Dasyatis sabina	147	80	194	20	90	12	14	9	9	575
Dasyatis say	1	7	5	5	6	.	.	.	.	24
Dasyatis spp.	.	.	1	1	1	.	.	.	.	3
Diapterus auratus	.	.	11	.	.	11	.	14	.	36
Diplectrum formosum	.	1	3	.	2	.	.	.	.	6
Diplodus holbrookii	1	71	23	138	61	.	.	.	.	294
Dorosoma petenense	.	.	5	.	.	.	3	.	1	9
Echeneis neucratoides	.	1	1	1	1	.	.	.	.	4
Elacatinus macrodon	.	7	.	.	.	.	.	.	.	7
Elops saurus	296	280	1,761	12	222	4	3	2	.	2,580
Elops smithi	1	.	.	.	.	.	.	.	.	1
Elops sp.	.	.	.	.	.	.	1	.	.	1
Etropus crossotus	.	14	5	18	15	.	.	.	.	52
Eucinostomus gula	2,515	1,125	776	2,202	2,801	642	210	363	3	10,637
Eucinostomus harengulus	1,684	515	559	213	366	1,391	1,215	1,072	690	7,705
Eucinostomus spp.	1,485	2,570	3,042	6,435	4,323	6,018	5,241	2,755	2,148	34,017
Eugerres plumieri	197	49	58	1	81	246	536	593	537	2,298
Farfantepenaeus duorarum	157	86	421	341	411	121	203	155	96	1,991
Fistularia tabacaria	.	.	1	.	.	.	.	.	.	1

Appendix TB13-03. (Continued)

Species	**Zone**									**Totals**
	A	**B**	**C**	**D**	**E**	**K**	**L**	**M**	**N**	
	E=168	**E=156**	**E=204**	**E=120**	**E=180**	**E=96**	**E=180**	**E=108**	**E=84**	**E=1,296**
Floridichthys carpio	213	49	600	247	131	90	36	.	.	1,366
Fundulus confluentus	.	.	.	.	.	197	5	.	1	203
Fundulus grandis	49	3	66	62	44	200	90	52	70	636
Fundulus seminolis	.	.	.	.	.	1	45	.	.	46
Fundulus similis	426	3	130	143	161	62	1	226	.	1,152
Gambusia holbrooki	.	.	.	.	.	1	289	.	2	292
Gobiesox strumosus	4	1	7	.	1	.	4	1	.	18
Gobionellus oceanicus	.	.	.	.	.	.	1	1	.	2
Gobiosoma bosc	3	1	2	1	.	28	95	16	41	187
Gobiosoma longipala	.	.	1	.	8	.	.	.	.	9
Gobiosoma robustum	83	7	29	64	55	.	5	1	.	244
Gobiosoma spp.	40	15	26	3	3	1	96	25	33	242
Gymnura micrura	5	1	2	3	10	.	.	.	.	21
Haemulon plumierii	.	.	.	18	7	.	.	.	.	25
Harengula jaguana	16,004	1,169	1,764	3,917	19,330	1,455	16	11	2	43,668
Hemicaranx amblyrhynchus	.	.	1	.	.	5	.	.	.	6
Hippocampus erectus	7	2	2	5	10	.	.	.	.	26
Hippocampus zosterae	5	4	.	16	2	.	1	.	.	28
Hypleurochilus caudovittatus	1	.	.	.	1	.	.	.	.	2
Hyporhamphus meeki	20	2	2	2	5	.	.	.	.	31
Hyporhamphus spp.	.	.	6	.	.	.	.	.	.	6
Hypsoblennius hentz	1	2	.	.	1	.	1	.	.	5
Ictalurus punctatus	.	.	.	.	.	.	9	.	.	9
Labidesthes sicculus	.	.	.	.	.	.	2	.	.	2
Lachnolaimus maximus	.	.	.	.	1	.	.	.	.	1
Lagodon rhomboides	4,749	9,421	4,191	23,801	21,420	536	685	945	300	66,048
Leiostomus xanthurus	667	441	599	1,122	595	197	69	47	40	3,777
Lepisosteus osseus	1	.	5	.	.	1	8	3	.	18
Lepisosteus platyrhincus	1	.	.	.	.	.	.	.	.	1
Lepomis macrochirus	.	.	.	.	.	.	6	.	2	8
Lepomis microlophus	.	.	.	.	.	.	5	.	.	5
Lepomis punctatus	.	.	.	.	.	.	2	.	.	2
Lepomis spp.	.	.	.	.	.	.	1	.	2	3

Appendix TB13-03. (Continued)

Species	**Zone**									**Totals**
	A	**B**	**C**	**D**	**E**	**K**	**L**	**M**	**N**	
	E=168	**E=156**	**E=204**	**E=120**	**E=180**	**E=96**	**E=180**	**E=108**	**E=84**	**E=1,296**
Limulus polyphemus	8	.	10	2	22	1	1	.	.	44
Lophogobius cyprinoides	.	.	3	.	.	.	11	.	.	14
Loricariidae sp.	.	.	.	.	.	.	1	.	.	1
Lucania parva	1,191	475	4,287	1,174	1,295	11	707	1	26	9,167
Lutjanus griseus	1	30	36	157	105	3	40	1	17	390
Lutjanus synagris	.	4	8	110	44	.	.	1	.	167
Membras martinica	30	2	2	13	.	89	.	6	.	142
Menidia spp.	3,662	184	729	1,814	700	2,188	3,397	1,594	629	14,897
Menippe spp.	32	12	6	20	51	1	.	.	.	122
Menticirrhus americanus	114	9	283	2	3	376	21	7	3	818
Menticirrhus saxatilis	1	4	2	.	10	.	.	.	.	17
Microgobius gulosus	539	130	687	112	227	87	424	64	231	2,501
Microgobius thalassinus	5	2	6	6	.	.	.	3	.	22
Micropogonias undulatus	.	.	4	.	.	.	.	.	.	4
Monacanthus ciliatus	.	.	.	2	1	.	.	.	.	3
Mugil cephalus	446	342	138	213	150	38	5	29	29	1,390
Mugil curema	42	35	6	58	61	.	1	1	3	207
Mugil trichodon	56	29	38	281	39	72	1	8	.	524
Mycteroperca microlepis	1	1	.	6	8	.	.	.	.	16
Nicholsina usta	.	3	2	93	44	.	.	.	.	142
Ogcocephalus cubifrons	.	.	.	6	7	.	.	.	.	13
Oligoplites saurus	66	16	95	13	71	50	25	69	10	415
Opisthonema oglinum	188	307	160	42	2,036	.	17	4	.	2,754
Opsanus beta	16	15	3	24	27	2	4	2	5	98
Oreochromis aureus	1	.	.	.	.	.	.	.	.	1
Oreochromis/Sarotherodon spp.	.	.	3	.	1	1	3	.	.	8
Orthopristis chrysoptera	482	666	327	2,433	1,567	4	13	109	8	5,609
Paraclinus marmoratus	.	.	.	.	4	.	.	.	.	4
Paralichthys albigutta	33	76	96	61	123	3	21	11	3	427
Penaeidae spp.	.	.	1	.	.	.	.	2	.	3
Poecilia latipinna	4	.	.	.	.	91	577	.	8	680
Pogonias cromis	6	41	22	1	49	.	1	.	7	127
Pomatomus saltatrix	2	.	.	.	.	.	.	.	.	2

Appendix TB13-03. (Continued)

Species	**Zone**									**Totals**
	A	**B**	**C**	**D**	**E**	**K**	**L**	**M**	**N**	
	E=168	**E=156**	**E=204**	**E=120**	**E=180**	**E=96**	**E=180**	**E=108**	**E=84**	**E=1,296**
Portunus spp.	25	204	112	28	526	5	.	.	.	900
Prionotus scitulus	27	151	271	39	138	17	4	3	.	650
Prionotus tribulus	30	14	65	5	14	10	20	5	2	165
Rhinobatos lentiginosus	.	1	1	.	.	.	.	.	.	2
Rhinoptera bonasus	3	3	34	2	3	.	.	.	.	45
Rimapenaeus constrictus	.	1	11	.	6	.	.	.	.	18
Sardinella aurita	.	.	.	1	41	.	.	.	.	42
Sarotherodon melanotheron	1	.	3	.	.	3	9	.	.	16
Sciaenops ocellatus	377	52	1,251	18	104	158	249	38	55	2,302
Scomberomorus maculatus	3	1	8	4	8	.	.	.	.	24
Scorpaena brasiliensis	.	.	.	1	1	.	.	.	.	2
Selene vomer	9	2	11	3	18	.	.	.	.	43
Serraniculus pumilio	.	1	.	.	3	.	.	.	.	4
Serranus subligarius	.	.	.	1	1	.	.	.	.	2
Sicyonia laevigata	.	.	.	.	1	.	.	.	.	1
Sicyonia typica	.	.	.	1	1	.	.	.	.	2
Sphoeroides nephelus	150	57	48	34	66	.	6	4	.	365
Sphoeroides spengleri	.	1	.	.	.	.	.	.	.	1
Sphoeroides sp.	.	.	.	1	.	.	.	.	.	1
Sphyraena barracuda	.	21	.	17	23	.	.	.	.	61
Sphyraena borealis	.	.	.	16	3	.	.	.	.	19
Sphyrna tiburo	2	6	1	7	8	.	.	.	.	24
Stephanolepis hispidus	.	7	5	97	88	.	.	.	.	197
Strongylura marina	28	9	18	11	36	3	12	10	.	127
Strongylura notata	371	281	228	252	230	77	25	10	.	1,474
Strongylura spp.	1	1	1	2	.	3	6	2	1	17
Strongylura timucu	2	1	.	.	6	.	2	16	.	27
Symphurus plagiusa	5	18	44	10	4	17	12	.	.	110
Syngnathus floridae	7	7	6	46	90	.	1	.	.	157
Syngnathus louisianae	15	9	22	18	20	1	4	1	1	91
Syngnathus scovelli	87	21	46	61	154	3	16	11	1	400
Synodus foetens	92	86	96	78	102	8	13	20	1	496
Trachinotus carolinus	.	.	11	1	1	.	.	.	.	13

Appendix TB13-03. (Continued)

Species	Zone									Totals
	A	B	C	D	E	K	L	M	N	
	E=168	E=156	E=204	E=120	E=180	E=96	E=180	E=108	E=84	E=1,296
Trachinotus falcatus	.	2	.	2	23	.	.	.	.	27
Trinectes maculatus	11	.	14	1	.	366	1,145	245	170	1,952
Tylosurus crocodilus	1	.	.	.	2	.	.	.	.	3
Urophycis floridana	.	2	6	2	2	.	.	.	.	12
Totals	**55,837**	**30,481**	**47,850**	**84,606**	**90,304**	**93,722**	**90,413**	**46,406**	**39,320**	**578,939**

Charlotte Harbor

Charlotte Harbor is a drowned river estuary located on the southwestern coast of Florida (Charlotte Harbor National Estuary Program 2000). The bay is connected to the Gulf of Mexico by passes at Boca Grande, San Carlos, and several smaller inlets. Freshwater inflow principally comes from the Peace, Caloosahatchee, and Myakka rivers. Shoreline vegetation consists largely of fringing mangroves, and seagrasses are the dominant bottom vegetation in shallow waters.

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in Charlotte Harbor since 1989. The area sampled was divided into four geographically-defined bay zones (A-D) and two riverine zones (M and P; Figure CH13-01). Monthly stratified-random sampling (SRS) was conducted in Zones A – D using 21.3-m bay seines, 183-m haul seines, and 6.1-m bay otter trawls. Monthly SRS was conducted in Zones M and P with 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2013 in Charlotte Harbor.

Stratified-Random Sampling

A total of 233,028 animals, which included 141 taxa of fishes and 8 taxa of selected invertebrates, were collected from 1,068 Charlotte Harbor SRS samples in 2013 (Table CH13-01, Appendices CH13-01, -02, and -03). *Anchoa mitchilli* (n=69,119), *Lagodon rhomboides* (n=47,860), and *Eucinostomus* spp. (n=29,181) were the most numerous species collected, representing 62.7% of the total catch. *Lucania parva* (n=13,625) and *Anchoa hepsetus* (n=13,494) were the next most abundant taxa collected, accounting for an additional 11.6% of the total catch. Thirty-one Selected Taxa (n=15,345 animals) composed 6.6% of the total catch. *Cynoscion arenarius* (n=2,569), *Farfantepenaeus duorarum* (n=2,566), and *Sciaenops ocellatus* (n=2,018) were the most abundant Selected Taxa, representing 3.1% of the total catch. *Callinectes sapidus* (n=1,038) and *Lutjanus griseus* (n=867) were the next most abundant Selected Taxa, comprising an additional 0.8% of the total catch. Collections in

2013 included one species new to the Charlotte Harbor FIM collection: *Anchoa lyolepis* (Dusky Anchovy) .

Bay Sampling

21.3-m Bay Seines. A total of 130,456 animals were collected in 408 21.3-m bay seines, representing 56.0% of the overall SRS catch (Table CH13-01). *Eucinostomus* spp. (n=27,351), *L. rhomboides* (n=26,364), *A. mitchilli* (n=22,397), *L. parva* (n=13,534), and *A. hepsetus* (n=13,166) were the most abundant taxa, accounting for 78.8% of the 21.3-m bay seine catch (Table CH13-02). The taxa most frequently caught in 21.3-m bay seines were *Eucinostomus* spp*.* (77.0% occurrence) and *L. rhomboides* (65.4% occurrence).

A total of 6,179 animals from 21 Selected Taxa were collected, representing 4.7% of the entire 21.3-m bay seine catch (Table CH13-03). *Farfantepenaeus duorarum* (n=1,967) and *S. ocellatus* (n=1,668) were the most abundant Selected Taxa, accounting for 58.8% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 21.3-m bay seines was *F. duorarum* (47.8% occurrence).

183-m Haul Seines. A total of 28,941 animals were collected in 204 183-m haul seines, representing 12.4% of the total SRS catch (Table CH13-01). *Lagodon rhomboides* (n=16,545) was the most abundant species, accounting for 57.2% of the 183-m haul seine catch (Table CH13-04). The taxon most frequently caught in 183-m haul seines was *L. rhomboides* (73.0% occurrence).

A total of 4,035 animals from 26 Selected Taxa were collected, representing 13.9% of the entire 183-m haul seine catch (Table CH13-05). *Centropomus undecimalis* (n=725), *L. griseus* (n=691), and *Archosargus probatocephalus* (n=625) were the most abundant Selected Taxon, accounting for 50.6% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 183-m haul seines were *A. probatocephalus* (52.5% occurrence), *C. undecimalis* (50.0% occurrence), and *Mugil cephalus* (43.1% occurrence).

6.1-m Bay Otter Trawls. A total of 22,753 animals were collected in 288 6.1-m bay otter trawls, representing 9.8% of the overall SRS catch (Table CH13-01). *Anchoa mitchilli* (n=5,951) and *L. rhomboides* (n=4,803) were the most abundant taxa collected, accounting for 47.3% of the 6.1-m bay otter trawl catch (Table CH13-06). The taxa most frequently caught in 6.1-m bay otter trawls were *Portunus* spp. (45.8% occurrence), *Prionotus scitulus* (44.8% occurrence), and *L. rhomboides* (41.3% occurrence).

A total of 2,671 animals from 15 Selected Taxa were collected, representing 11.7% of the entire 6.1-m bay otter trawl catch (Table CH13-07). *Cynoscion arenarius* (n=1,045), *F. duorarum* (n=481), and *Menippe* spp. (n=403) were the most abundant Selected Taxa, accounting for 72.2% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 6.1-m bay otter trawls were *F. duorarum* (26.0% occurrence), *C. sapidus* (25.3% occurrence), and *Menippe* spp. (25.0% occurrence).

River Sampling

21.3-m River Seines. A total of 44,313 animals were collected in 96 21.3-m river seines, representing 19.0% of the overall SRS catch (Table CH13-01). *Anchoa mitchilli* (n=37,990) was the most abundant taxon collected, accounting for 85.7% of the 21.3-m river seine catch (Table CH13-08). The taxa most frequently caught in 21.3-m river seines were *Eucinostomus* spp. (72.9% occurrence), *Menidia* spp. (68.8% occurrence), and *Eucinostomus harengulus* (60.4% occurrence).

A total of 572 animals from 12 Selected Taxa were collected, representing 1.3% of the entire 21.3-m river seine catch (Table CH13-09). *Callinectes sapidus* (n=261) and *S. ocellatus* (n=177) were the most abundant Selected Taxa, accounting for 76.6% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 21.3-m river seines were *C. sapidus* (27.1% occurrence), *S. ocellatus* (21.9% occurrence), and *F. duorarum* (12.5% occurrence).

6.1-m River Otter Trawls. A total of 6,565 animals were collected in 72 6.1-m river otter trawls, representing 2.8% of the overall SRS catch (Table CH13-01). *Anchoa mitchilli* (n=2,781) and *C. arenarius* (n=1,346) were the most abundant taxa collected, accounting for 62.9% of the 6.1-m river otter trawl catch (Table CH13-10). The taxa most frequently caught in 6.1-m river otter trawls were *C. sapidus* (65.3% occurrence) and *Trinectes maculatus* (50.0% occurrence).

A total of 1,888 animals from 10 Selected Taxa were collected, representing

28.8% of the entire 6.1-m river otter trawl catch (Table CH13-11). *Cynoscion arenarius* (n=1,346), *Menticirrhus americanus* (n=236), and *C. sapidus* (n=215) were the most abundant Selected Taxa, accounting for 95.2% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in the 6.1-m river otter trawls was *C. sapidus* (65.3% occurrence).

References

Charlotte Harbor National Estuary Program. 2000. Comprehensive Conservation and Management Plan, Volume 1. 250 pp.

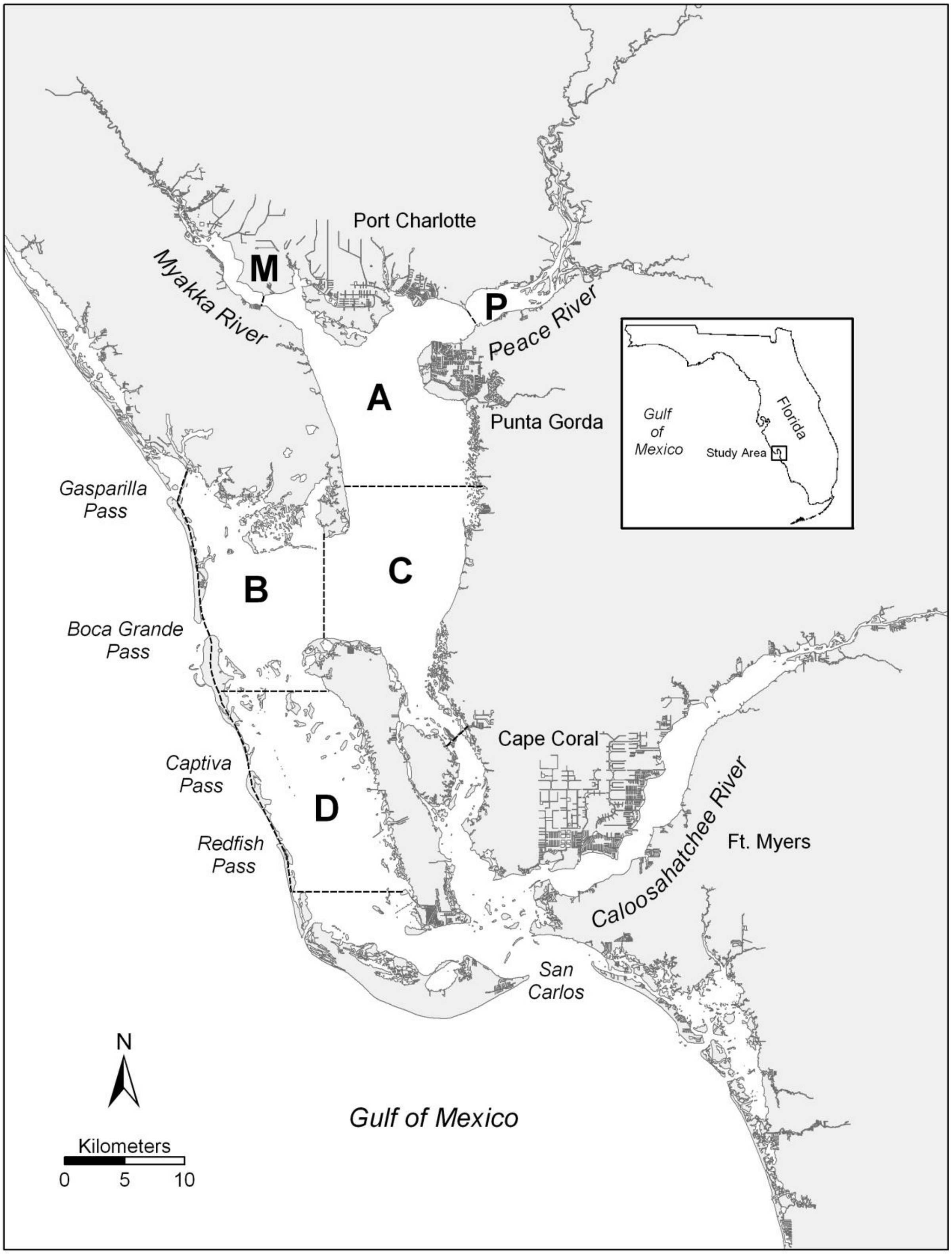

Figure CH13-01. Map of Charlotte Harbor sampling area. Zones are labeled A - D, M, and P.

Table CH13-01. Summary of catch and effort data for Charlotte Harbor stratified-random sampling, 2013.

Zone	21.3-m bay seine		21.3-m river seine		183-m haul seine		6.1-m otter trawl		Totals	
	Animals	Hauls	Animals	Hauls	Animals		Animals	Hauls	Animals	Hauls
A	17,519	120	.	.	1,511	60	6,738	84	25,768	264
B	53,221	96	.	.	8,762	48	5,924	72	67,907	216
C	30,197	96	.	.	5,139	48	5,146	72	40,482	216
D	29,519	96	.	.	13,529	48	4,945	60	47,993	204
M	.	.	18,725	48	.	.	2,566	36	21,291	84
P	.	.	25,588	48	.	.	3,999	36	29,587	84
Totals	**130,456**	**408**	**44,313**	**96**	**28,941**	**204**	**29,318**	**360**	**233,028**	**1,068**

Table CH13-02. Catch statistics for 10 dominant taxa collected in 408 21.3-m bay seine samples during Charlotte Harbor stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Eucinostomus spp.	27,351	21.0	77.0	47.88	5.79	244.40	1,337.14	26	0.04	8	39
Lagodon rhomboides	26,364	20.2	65.4	46.16	5.53	241.84	1,034.29	37	0.09	10	177
Anchoa mitchilli	22,397	17.2	21.8	39.21	12.50	643.85	3,674.29	33	0.04	18	77
Lucania parva	13,534	10.4	36.8	23.69	4.54	387.28	1,022.86	25	0.05	10	42
Anchoa hepsetus	13,166	10.1	1.5	23.05	22.91	2,007.93	9,348.57	39	0.03	23	52
Eucinostomus gula	3,432	2.6	55.1	6.01	0.59	199.97	78.57	53	0.17	40	99
Menidia spp.	3,167	2.4	22.5	5.54	1.35	492.81	411.43	37	0.18	16	92
Microgobius gulosus	2,283	1.8	42.6	4.00	0.68	341.39	185.00	29	0.15	7	54
Farfantepenaeus duorarum	1,967	1.5	47.8	3.44	0.51	296.29	91.43	10	0.09	2	32
Harengula jaguana	1,851	1.4	4.7	3.24	2.23	1,389.61	885.71	61	0.30	21	78
Subtotal	115,512	88.6	.	.	.	.	.	.	.	2	177
Totals	**130,456**	**100.0**	**.**	**228.39**	**27.97**	**247.40**	**9,436.43**	**.**	**.**	**2**	**396**

Table CH13-03. Catch statistics for Selected Taxa collected in 408 21.3-m bay seine samples during Charlotte Harbor stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Farfantepenaeus duorarum	1,967	1.5	47.8	3.44	0.51	296.29	91.43	10	0.09	2	32
Sciaenops ocellatus	1,668	1.3	13.0	2.92	1.28	888.42	500.71	26	0.27	10	245
Leiostomus xanthurus	631	0.5	5.1	1.10	0.75	1,368.73	288.57	21	0.26	14	78
Cynoscion nebulosus	487	0.4	21.8	0.85	0.22	530.93	83.57	41	0.76	9	127
Mugil curema	261	0.2	1.5	0.46	0.34	1,507.06	134.29	27	0.41	14	80
Mugil trichodon	244	0.2	2.2	0.43	0.37	1,726.71	147.86	17	0.62	11	137
Callinectes sapidus	217	0.2	17.2	0.38	0.08	429.07	19.29	30	2.45	5	171
Cynoscion arenarius	160	0.1	4.2	0.28	0.13	910.88	43.57	28	0.82	16	74
Lutjanus griseus	156	0.1	11.0	0.27	0.06	478.15	15.71	56	3.94	12	190
Lutjanus synagris	120	0.1	5.4	0.21	0.08	812.58	30.00	35	0.96	19	70
Archosargus probatocephalus	115	0.1	10.5	0.20	0.06	557.94	17.86	46	5.98	15	324
Trachinotus falcatus	42	<0.1	0.7	0.07	0.07	1,924.68	28.57	42	1.23	25	62
Menticirrhus americanus	38	<0.1	3.9	0.07	0.02	674.16	6.43	30	1.96	13	70
Mugil cephalus	26	<0.1	1.7	0.05	0.03	1,122.74	7.86	62	12.84	22	280
Albula vulpes	15	<0.1	1.0	0.03	0.02	1,282.25	5.71	51	2.56	27	62
Centropomus undecimalis	14	<0.1	2.2	0.02	0.01	784.86	2.86	129	39.26	15	396
Menticirrhus saxatilis	10	<0.1	2.0	0.02	0.01	750.05	1.43	41	7.92	13	92

Table CH13-03. (Continued)

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Paralichthys albigutta	4	<0.1	0.5	0.01	0.01	1,595.69	2.14	35	4.27	25	45
Menippe spp.	2	<0.1	0.2	<0.01	<0.01	2,019.90	1.43	12	2.50	9	14
Trachinotus carolinus	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	277	.	277	277
Pogonias cromis	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	365	.	365	365
Totals	**6,179**	**4.7**	**.**	**10.82**	**1.72**	**321.21**	**507.86**	**.**	**.**	**2**	**396**

Table CH13-04. Catch statistics for 10 dominant taxa collected in 204 183-m haul seine samples during Charlotte Harbor stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	16,545	57.2	73.0	81.10	10.99	193.55	1,087.00	100	0.21	25	235
Ariopsis felis	3,760	13.0	22.1	18.43	15.94	1,234.92	3,249.00	252	0.52	145	405
Orthopristis chrysoptera	883	3.1	16.2	4.33	2.10	692.29	379.00	98	0.93	54	222
Eucinostomus gula	744	2.6	36.8	3.65	0.73	284.68	103.00	80	0.34	40	130
Centropomus undecimalis	725	2.5	50.0	3.55	0.58	233.96	77.00	509	5.88	154	935
Lutjanus griseus	691	2.4	37.3	3.39	0.89	377.15	128.00	163	1.66	36	299
Archosargus probatocephalus	625	2.2	52.5	3.06	0.60	279.04	101.00	202	3.01	60	417
Chaetodipterus faber	517	1.8	8.3	2.53	2.02	1,138.75	405.00	161	1.65	44	375
Elops saurus	474	1.6	15.7	2.32	1.31	807.57	196.00	330	2.54	171	435
Mugil cephalus	452	1.6	43.1	2.22	0.51	331.63	76.00	308	2.50	112	423
Subtotal	25,416	87.8	.	.	.	.	.	.	.	25	935
Totals	**28,941**	**100.0**	**.**	**141.87**	**20.73**	**208.66**	**3,264.00**	**.**	**.**	**15**	**935**

Table CH13-05. Catch statistics for Selected Taxa collected in 204 183-m haul seine samples during Charlotte Harbor stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Centropomus undecimalis	725	2.5	50.0	3.55	0.58	233.96	77.00	509	5.88	154	935
Lutjanus griseus	691	2.4	37.3	3.39	0.89	377.15	128.00	163	1.66	36	299
Archosargus probatocephalus	625	2.2	52.5	3.06	0.60	279.04	101.00	202	3.01	60	417
Elops saurus	474	1.6	15.7	2.32	1.31	807.57	196.00	330	2.54	171	435
Mugil cephalus	452	1.6	43.1	2.22	0.51	331.63	76.00	308	2.50	112	423
Mugil trichodon	196	0.7	14.2	0.96	0.26	383.06	27.00	174	3.29	103	295
Sciaenops ocellatus	172	0.6	39.2	0.84	0.11	189.64	15.00	421	8.53	109	678
Mugil curema	165	0.6	15.2	0.81	0.33	579.36	61.00	175	4.77	105	315
Callinectes sapidus	93	0.3	21.6	0.46	0.08	247.58	8.00	115	3.80	42	182
Leiostomus xanthurus	90	0.3	10.3	0.44	0.16	524.82	25.00	109	4.48	75	280
Pogonias cromis	52	0.2	5.9	0.25	0.11	627.13	15.00	353	10.96	112	490
Cynoscion nebulosus	50	0.2	15.7	0.25	0.05	277.26	5.00	285	16.63	95	535
Mycteroperca microlepis	49	0.2	4.4	0.24	0.11	667.12	16.00	203	16.87	105	559
Lutjanus synagris	48	0.2	4.4	0.24	0.11	671.46	16.00	90	1.98	67	132
Paralichthys albigutta	46	0.2	13.7	0.23	0.05	294.68	5.00	250	11.98	66	364
Trachinotus carolinus	38	0.1	2.5	0.19	0.12	958.35	24.00	296	5.28	216	377
Trachinotus falcatus	34	0.1	3.4	0.17	0.09	737.06	14.00	185	10.06	84	280

Table CH13-05. (Continued)

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Scomberomorus maculatus	13	<0.1	2.9	0.06	0.04	909.37	8.00	354	11.27	321	470
Farfantepenaeus duorarum	10	<0.1	3.4	0.05	0.02	599.13	3.00	20	1.50	15	30
Menticirrhus saxatilis	3	<0.1	1.0	0.01	0.01	1,062.48	2.00	127	9.06	115	145
Epinephelus itajara	2	<0.1	1.0	0.01	0.01	1,007.46	1.00	236	71.50	164	307
Pomatomus saltatrix	2	<0.1	1.0	0.01	0.01	1,007.46	1.00	477	6.50	470	483
Epinephelus morio	2	<0.1	0.5	0.01	0.01	1,428.29	2.00	91	4.00	87	95
Menippe sp.	1	<0.1	0.5	<0.01	<0.01	1,428.29	1.00	55	.	55	55
Lutjanus analis	1	<0.1	0.5	<0.01	<0.01	1,428.29	1.00	212	.	212	212
Menticirrhus littoralis	1	<0.1	0.5	<0.01	<0.01	1,428.29	1.00	217	.	217	217
Totals	**4,035**	**13.9**	**.**	**19.78**	**2.60**	**187.72**	**292.00**	**.**	**.**	**15**	**935**

Table CH13-06. Catch statistics for 10 dominant taxa collected in 288 6.1-m bay otter trawl samples during Charlotte Harbor stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	5,951	26.2	7.3	1.39	0.69	844.47	144.77	35	0.15	13	60
Lagodon rhomboides	4,803	21.1	41.3	1.19	0.21	298.70	28.87	79	0.41	11	163
Portunus spp.	1,972	8.7	45.8	0.46	0.09	345.18	19.77	47	0.23	4	92
Orthopristis chrysoptera	1,824	8.0	25.0	0.45	0.17	643.18	45.80	95	0.63	10	192
Eucinostomus gula	1,153	5.1	27.4	0.33	0.11	584.63	28.87	82	0.39	40	127
Cynoscion arenarius	1,045	4.6	9.4	0.25	0.16	1,125.24	46.34	35	0.94	12	273
Bairdiella chrysoura	521	2.3	8.0	0.12	0.09	1,257.67	26.11	39	1.23	11	147
Trinectes maculatus	498	2.2	16.7	0.12	0.05	700.14	9.58	59	0.68	31	113
Farfantepenaeus duorarum	481	2.1	26.0	0.11	0.03	392.40	4.92	17	0.32	3	41
Prionotus scitulus	454	2.0	44.8	0.11	0.01	228.18	2.83	99	1.94	19	200
Subtotal	18,702	82.2	.	.	.	.	.	.	.	3	273
Totals	**22,753**	**100.0**	**.**	**5.50**	**0.85**	**261.47**	**147.60**	**.**	**.**	**2**	**577**

Table CH13-07. Catch statistics for Selected Taxa collected in 288 6.1-m bay otter trawl samples during Charlotte Harbor stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Cynoscion arenarius	1,045	4.6	9.4	0.25	0.16	1,125.24	46.34	35	0.94	12	273
Farfantepenaeus duorarum	481	2.1	26.0	0.11	0.03	392.40	4.92	17	0.32	3	41
Menippe spp.	403	1.8	25.0	0.10	0.02	335.13	2.97	18	0.73	2	97
Lutjanus synagris	248	1.1	18.4	0.06	0.01	415.72	3.10	71	2.19	14	129
Callinectes sapidus	252	1.1	25.3	0.06	0.01	279.68	1.48	82	2.41	9	212
Menticirrhus americanus	170	0.8	11.5	0.04	0.02	647.46	4.12	62	4.86	11	278
Paralichthys albigutta	24	0.1	8.3	0.01	<0.01	332.24	0.07	226	9.70	135	315
Cynoscion nebulosus	21	0.1	1.4	0.01	<0.01	1,324.77	1.15	63	14.75	25	300
Lutjanus griseus	13	0.1	1.4	<0.01	<0.01	987.66	0.40	134	7.98	45	158
Archosargus probatocephalus	6	<0.1	1.7	<0.01	<0.01	795.11	0.13	90	27.59	25	175
Elops saurus	2	<0.1	0.3	<0.01	<0.01	1,697.06	0.13	245	1.00	244	246
Mycteroperca microlepis	2	<0.1	0.3	<0.01	<0.01	1,697.06	0.13	173	8.00	165	181
Leiostomus xanthurus	2	<0.1	0.3	<0.01	<0.01	1,697.06	0.13	111	7.50	103	118
Rachycentron canadum	1	<0.1	0.3	<0.01	<0.01	1,697.06	0.07	206	.	206	206
Menticirrhus saxatilis	1	<0.1	0.3	<0.01	<0.01	1,697.06	0.07	245	.	245	245
Totals	**2,671**	**11.7**	**.**	**0.63**	**0.18**	**484.26**	**49.11**	**.**	**.**	**2**	**315**

Table CH13-08. Catch statistics for 10 dominant taxa collected in 96 21.3-m river seine samples during Charlotte Harbor stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	37,990	85.7	58.3	581.95	299.55	504.32	28,047.06	30	0.03	17	57
Menidia spp.	1,771	4.0	68.8	27.13	4.57	164.98	208.82	38	0.20	14	64
Eucinostomus spp.	1,422	3.2	72.9	21.78	6.02	270.60	501.47	31	0.15	11	39
Eucinostomus harengulus	582	1.3	60.4	8.92	1.67	183.30	108.82	55	0.49	40	96
Poecilia latipinna	440	1.0	13.5	6.74	5.82	846.70	558.82	46	0.22	22	60
Anchoa hepsetus	292	0.7	2.1	4.47	4.38	959.66	420.59	43	0.30	33	50
Callinectes sapidus	261	0.6	27.1	4.00	1.23	300.84	73.53	17	0.88	5	172
Fundulus similis	195	0.4	14.6	2.99	1.47	481.96	119.12	37	1.07	18	86
Sciaenops ocellatus	177	0.4	21.9	2.71	1.08	391.93	82.35	35	1.66	12	187
Fundulus grandis	143	0.3	19.8	2.19	0.68	306.33	38.24	53	0.89	32	92
Subtotal	43,273	97.7	.	.	.	.	.	.	.	5	187
Totals	**44,313**	**100.0**	**.**	**678.81**	**299.48**	**432.26**	**28,066.18**	**.**	**.**	**5**	**450**

Table CH13-09. Catch statistics for Selected Taxa collected in 96 21.3-m river seine samples during Charlotte Harbor stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Callinectes sapidus	261	0.6	27.1	4.00	1.23	300.84	73.53	17	0.88	5	172
Sciaenops ocellatus	177	0.4	21.9	2.71	1.08	391.93	82.35	35	1.66	12	187
Mugil cephalus	35	0.1	6.3	0.54	0.42	761.50	39.71	85	3.91	20	151
Farfantepenaeus duorarum	32	0.1	12.5	0.49	0.23	466.11	20.59	12	0.84	5	22
Cynoscion arenarius	18	<0.1	5.2	0.28	0.19	671.56	17.65	55	3.10	29	73
Cynoscion nebulosus	12	<0.1	5.2	0.18	0.10	535.08	7.35	38	5.95	15	97
Centropomus undecimalis	8	<0.1	5.2	0.12	0.06	482.10	4.41	218	57.76	41	450
Lutjanus griseus	7	<0.1	3.1	0.11	0.07	636.91	5.88	108	9.32	74	149
Menticirrhus americanus	6	<0.1	6.3	0.09	0.04	389.33	1.47	45	6.87	24	73
Archosargus probatocephalus	6	<0.1	5.2	0.09	0.04	453.29	2.94	173	62.77	40	430
Mugil trichodon	6	<0.1	1.0	0.09	0.09	979.80	8.82	17	0.22	16	17
Elops saurus	4	<0.1	4.2	0.06	0.03	482.10	1.47	101	19.40	58	152
Totals	**572**	**1.3**	**.**	**8.76**	**1.86**	**208.12**	**108.82**	**.**	**.**	**5**	**450**

Table CH13-10. Catch statistics for 10 dominant taxa collected in 72 6.1-m river otter trawl samples during Charlotte Harbor stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	2,781	42.4	40.3	5.20	1.85	301.79	85.54	37	0.15	18	65
Cynoscion arenarius	1,346	20.5	37.5	2.52	1.16	392.16	65.84	38	0.51	10	209
Trinectes maculatus	595	9.1	50.0	1.07	0.30	235.54	12.14	48	0.60	11	106
Ariopsis felis	493	7.5	40.3	0.91	0.30	282.44	15.52	83	2.10	45	303
Bairdiella chrysoura	428	6.5	29.2	0.75	0.54	615.77	38.76	66	0.88	16	167
Menticirrhus americanus	236	3.6	33.3	0.44	0.21	412.85	14.84	64	2.20	15	229
Callinectes sapidus	215	3.3	65.3	0.40	0.08	180.01	4.59	74	3.41	8	183
Farfantepenaeus duorarum	76	1.2	36.1	0.14	0.04	214.33	2.02	17	1.13	4	43
Bagre marinus	52	0.8	23.6	0.10	0.03	247.71	1.21	126	11.65	40	360
Prionotus tribulus	37	0.6	16.7	0.07	0.02	308.12	1.21	41	3.07	19	94
Subtotal	6,259	95.3	.	.	.	.	.	.	.	4	360
Totals	**6,565**	**100.0**	**.**	**12.16**	**2.38**	**165.75**	**86.21**	**.**	**.**	**4**	**860**

Table CH13-11. Catch statistics for Selected Taxa collected in 72 6.1-m river otter trawl samples during Charlotte Harbor stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Cynoscion arenarius	1,346	20.5	37.5	2.52	1.16	392.16	65.84	38	0.51	10	209
Menticirrhus americanus	236	3.6	33.3	0.44	0.21	412.85	14.84	64	2.20	15	229
Callinectes sapidus	215	3.3	65.3	0.40	0.08	180.01	4.59	74	3.41	8	183
Farfantepenaeus duorarum	76	1.2	36.1	0.14	0.04	214.33	2.02	17	1.13	4	43
Cynoscion nebulosus	7	0.1	6.9	0.01	0.01	394.28	0.27	60	13.21	19	98
Micropogonias undulatus	4	0.1	2.8	0.01	0.01	595.76	0.27	95	4.42	90	108
Epinephelus itajara	1	<0.1	1.4	<0.01	<0.01	848.53	0.13	250	.	250	250
Archosargus probatocephalus	1	<0.1	1.4	<0.01	<0.01	848.53	0.13	128	.	128	128
Paralichthys albigutta	1	<0.1	1.4	<0.01	<0.01	848.53	0.13	320	.	320	320
Sciaenops ocellatus	1	<0.1	1.4	<0.01	<0.01	848.53	0.12	196	.	196	196
Totals	**1,888**	**28.8**	**.**	**3.52**	**1.36**	**328.06**	**81.62**	**.**	**.**	**4**	**320**

Appendix CH13-01. Monthly summary of species collected during Charlotte Harbor stratified-random sampling, 2013. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	**Month**												**Totals**
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=89	**E=89**	**E=89**	**E=89**	**E=89**	**E=89**	**E=89**	**E=89**	**E=89**	**E=89**	**E=89**	**E=89**	**E=1,068**
Acanthostracion quadricornis	20	14	18	11	11	22	10	17	8	5	13	8	157
Achirus lineatus	3	6	3	3	.	6	3	19	48	12	20	5	128
Adinia xenica	.	14	87	.	.	.	.	.	.	1	2	.	104
Albula vulpes	.	.	.	1	8	.	5	.	.	.	1	.	15
Aluterus schoepfii	.	.	.	.	.	9	4	2	.	.	.	.	15
Ameiurus catus	.	.	.	.	.	.	.	2	.	31	.	.	33
Anarchopterus criniger	.	.	.	.	1	2	.	1	.	.	.	.	4
Anchoa hepsetus	8	.	.	14	294	8	.	15	13,094	.	.	61	13,494
Anchoa lyolepis	1	.	.	9	.	.	.	.	.	.	.	.	10
Anchoa mitchilli	6,071	5,517	2,206	3,337	19,134	2,810	775	4,536	6,729	1,400	9,868	6,736	69,119
Ancylopsetta quadrocellata	.	.	.	.	.	1	.	1	.	.	.	.	2
Archosargus probatocephalus	32	203	45	13	110	54	40	54	65	58	42	37	753
Argopecten gibbus	1	.	.	.	.	.	.	.	.	.	.	.	1
Ariopsis felis	8	3,264	45	28	40	110	115	219	188	320	25	23	4,385
Astroscopus y-graecum	.	.	1	.	.	.	.	.	.	.	.	.	1
Bagre marinus	1	1	.	.	.	.	3	20	27	5	3	1	61
Bairdiella chrysoura	17	22	137	54	253	472	858	747	185	139	19	.	2,903
Bathygobius soporator	11	2	5	.	.	.	.	.	.	3	18	34	73
Brevoortia spp.	.	.	2	.	.	1	.	2	.	.	.	.	5
Calamus penna	.	.	.	.	.	1	.	1	.	.	.	6	8
Calamus spp.	5	9	6	9	2	.	.	.	.	.	1	1	33
Callinectes ornatus	.	.	2	1	3	9	23	2	.	1	.	.	41
Callinectes sapidus	215	108	204	136	47	67	41	39	28	51	67	35	1,038

Appendix CH13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=1,068
Caranx hippos	7	10	3	3	2	8	4	8	3	2	11	23	84
Carcharhinus leucas	.	.	.	.	.	.	.	.	2	.	.	.	2
Centropomus undecimalis	54	97	92	31	75	39	33	84	63	47	66	66	747
Centropristis striata	1	1	1	.	1	4	2	1	10	2	1	2	26
Chaetodipterus faber	8	80	1	1	6	7	9	18	15	407	2	.	554
Chasmodes saburrae	19	5	1	2	4	7	30	22	3	2	23	18	136
Chilomycterus schoepfii	99	50	85	28	28	46	26	28	111	32	48	48	629
Chloroscombrus chrysurus	.	.	1	3	1	1	41	53	5	1	8	4	118
Cichlasoma urophthalmus	.	.	.	.	.	1	.	.	1	.	1	.	3
Citharichthys macrops	1	3	8	4	3	.	2	.	2	3	2	4	32
Ctenogobius boleosoma	.	20	.	9	.	.	.	.	.	.	3	.	32
Cynoscion arenarius	6	.	14	48	2	715	1,185	266	43	231	58	1	2,569
Cynoscion nebulosus	3	15	5	1	32	63	251	95	65	23	18	6	577
Cyprinodon variegatus	28	.	160	30	312	6	.	9	1	.	44	1	591
Dasyatis americana	.	.	.	1	.	4	1	.	.	.	.	2	8
Dasyatis sabina	2	9	12	9	32	4	4	21	6	17	7	4	127
Dasyatis say	.	1	2	1	3	6	8	.	.	.	4	2	27
Diapterus auratus	.	.	.	.	.	.	2	7	11	30	10	.	60
Diplectrum formosum	9	5	5	.	1	3	2	3	1	4	10	5	48
Diplodus holbrookii	.	.	.	.	.	.	.	19	6	.	1	2	28
Echeneis neucratoides	.	.	.	.	.	.	.	.	.	1	.	.	1
Elops saurus	5	6	26	5	4	6	16	10	16	4	199	183	480
Epinephelus itajara	1	1	.	.	.	1	.	.	.	.	.	.	3
Epinephelus morio	.	.	.	.	.	.	.	2	.	.	.	.	2

Appendix CH13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=1,068
Etropus crossotus	12	15	6	2	.	1	1	18	48	11	52	17	183
Eucinostomus gula	296	392	145	627	837	471	583	744	483	194	374	222	5,368
Eucinostomus harengulus	114	73	101	201	321	99	329	213	185	81	173	107	1,997
Eucinostomus spp.	1,871	1,957	592	568	263	878	1,959	2,980	2,707	4,148	6,834	4,424	29,181
Eugerres plumieri	.	6	1	.	11	58	40	82	38	56	16	2	310
Farfantepenaeus duorarum	163	94	85	50	16	59	243	556	507	348	199	246	2,566
Floridichthys carpio	86	46	5	52	211	119	8	42	9	15	158	16	767
Fundulus confluentus	1	.	6	.	.	.	.	.	.	2	.	.	9
Fundulus grandis	42	62	43	2	3	3	5	3	2	19	55	12	251
Fundulus seminolis	.	.	.	.	.	.	.	8	.	1	.	.	9
Fundulus similis	7	3	102	3	352	257	24	10	12	.	28	.	798
Gambusia holbrooki	11	8	.	.	.	.	.	.	.	40	32	6	97
Gobiesox strumosus	1	.	1	.	1	.	.	.	.	.	.	2	5
Gobionellus oceanicus	.	.	.	.	.	.	1	.	.	.	.	.	1
Gobiosoma bosc	2	.	3	.	.	5	.	.	1	2	6	.	19
Gobiosoma longipala	8	18	6	2	5	.	.	2	1	.	.	.	42
Gobiosoma robustum	142	197	207	240	61	29	41	13	7	9	42	34	1,022
Gobiosoma spp.	4	12	8	1	7	22	43	14	59	13	16	6	205
Gymnura micrura	3	.	.	2	1	.	1	.	.	.	.	.	7
Haemulon aurolineatum	.	.	.	.	.	.	.	.	1	.	.	1	2
Haemulon plumierii	3	2	3	.	3	1	1	3	1	3	19	15	54
Halichoeres bivittatus	.	.	.	.	1	.	.	.	.	.	.	.	1
Harengula jaguana	1	1,245	5	281	197	31	126	81	52	26	140	95	2,280
Hemicaranx amblyrhynchus	.	.	.	.	.	.	.	1	.	1	.	.	2
Hemichromis letourneuxi	.	.	.	.	.	.	.	1	.	5	2	1	9

Appendix CH13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=1,068
Hippocampus erectus	.	2	6	6	2	2	2	1	1	2	2	3	29
Hippocampus zosterae	5	5	13	1	2	5	.	2	.	4	4	1	42
Hoplosternum littorale	.	.	.	.	.	.	2	.	.	.	.	.	2
Hypleurochilus caudovittatus	.	.	.	.	.	.	.	6	.	.	.	1	7
Hyporhamphus meeki	.	1	.	.	.	5	.	.	.	1	.	.	7
Hyporhamphus spp.	.	.	.	.	1	1	.	.	.	.	.	.	2
Hyporhamphus unifasciatus	.	2	.	.	.	.	.	.	.	.	.	.	2
Hypsoblennius hentz	.	.	5	.	.	.	.	.	.	.	2	.	7
Lagodon rhomboides	1,547	3,265	3,072	9,405	8,049	5,470	3,602	2,553	3,919	2,191	3,552	1,235	47,860
Leiostomus xanthurus	593	27	3	20	28	27	19	.	1	4	1	.	723
Lepisosteus osseus	.	.	.	.	.	.	1	.	.	.	1	1	3
Lepisosteus platyrhincus	.	.	.	.	.	1	.	.	2	.	.	.	3
Limulus polyphemus	.	3	11	1	3	3	2	7	.	2	7	1	40
Lophogobius cyprinoides	1	.	.	.	.	.	.	.	.	2	1	.	4
Lucania parva	1,250	125	754	997	1,104	1,816	2,799	2,483	776	334	649	538	13,625
Lutjanus analis	.	.	.	.	.	.	.	.	.	1	.	.	1
Lutjanus griseus	4	10	1	7	19	68	89	118	252	245	26	28	867
Lutjanus synagris	13	.	1	.	2	9	70	74	106	58	56	27	416
Membras martinica	.	.	.	.	6	63	3	43	.	8	1	.	124
Menidia spp.	375	266	168	369	498	1,283	510	339	595	204	168	163	4,938
Menippe spp.	22	24	72	4	4	2	9	38	24	100	25	82	406
Menticirrhus americanus	39	23	10	21	8	132	25	35	5	98	31	23	450
Menticirrhus littoralis	.	.	.	.	.	.	.	.	.	1	.	.	1
Menticirrhus saxatilis	1	.	4	1	3	.	.	.	.	.	.	5	14
Microgobius gulosus	315	77	123	105	211	111	481	311	199	188	190	44	2,355

Appendix CH13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=1,068
Microgobius thalassinus	5	13	1	1	.	3	2	.	.	.	.	.	25
Micropogonias undulatus	.	.	.	4	.	.	.	.	.	.	.	.	4
Monacanthus ciliatus	.	2	.	.	.	.	.	3	.	1	2	1	9
Mugil cephalus	66	106	68	29	44	22	12	10	52	21	66	17	513
Mugil curema	21	9	.	6	75	190	5	8	67	9	3	33	426
Mugil trichodon	8	10	26	37	256	.	13	2	.	47	24	23	446
Mullus auratus				3									3
Mycteroperca microlepis	1	.	.	.	.	1	1	16	10	1	15	6	51
Myrophis punctatus	.	.	1	1	.	.	1	.	.	.	.	.	3
Nicholsina usta	30	1	13	2	28	2	5	5	.	.	5	4	95
Ocyurus chrysurus	.	.	.	.	.	.	.	1	1	.	.	.	2
Ogcocephalus cubifrons	2	5	5	2	.	2	2	5	4	3	.	2	32
Oligoplites saurus	.	.	.	4	8	27	62	30	17	10	3	.	161
Opisthonema oglinum	.	2	.	3	8	9	939	102	6	.	.	2	1,071
Opsanus beta	2	4	1	1	2	21	16	16	10	10	7	3	93
Oreochromis aureus	.	.	1	.	.	.	.	.	.	5	.	.	6
Orthopristis chrysoptera	84	31	6	903	337	507	1,060	385	532	159	239	55	4,298
Parablennius marmoreus	.	.	.	.	.	.	1	.	.	.	.	.	1
Paraclinus marmoratus	1	.	.	.	.	.	1	.	2	.	.	3	7
Paralichthys albigutta	8	5	14	5	10	7	1	3	7	4	4	7	75
Poecilia latipinna	2	33	20	1	.	2	.	1	.	3	385	8	455
Pogonias cromis	1	15	.	.	.	.	1	2	1	18	9	6	53
Pomatomus saltatrix	.	.	.	.	.	.	.	.	1	1	.	.	2
Portunus spp.	64	521	251	112	173	395	195	75	11	20	57	111	1,985
Prionotus scitulus	43	26	28	5	14	14	35	30	67	42	62	135	501
Prionotus tribulus	18	30	20	.	3	.	3	3	1	11	27	37	153

Appendix CH13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=1,068
Rachycentron canadum	.	.	.	.	.	.	1	.	.	.	.	.	1
Raja eglanteria	1	.	.	.	.	.	.	.	.	.	.	1	2
Rhinoptera bonasus	.	.	1	3	.	.	.	.	.	.	.	1	5
Rimapenaeus constrictus	2	1	.	.	.	.	.	2	.	.	13	8	26
Sardinella aurita	.	.	.	.	.	.	.	.	4	.	.	.	4
Sciaenops ocellatus	109	23	28	8	20	16	14	7	27	206	736	824	2,018
Scomberomorus maculatus	.	.	8	.	.	1	.	1	1	.	1	1	13
Scorpaena brasiliensis	2	.	1	.	.	2	.	.	1	.	.	1	7
Selene vomer	.	.	.	1	.	.	1	5	.	.	.	3	10
Serraniculus pumilio	.	3	.	.	.	.	.	.	.	.	.	.	3
Serranus subligarius	3	.	2	1	.	.	.	4	.	.	1	2	13
Sphoeroides nephelus	51	37	17	24	33	42	23	22	52	18	26	37	382
Sphoeroides spengleri	.	.	1	1	.	.	.	.	.	.	.	1	3
Sphyraena barracuda	4	3	.	.	2	.	1	.	2	9	3	2	26
Sphyraena borealis	.	.	.	6	3	.	.	.	.	.	.	.	9
Sphyraena guachancho	.	.	.	.	.	3	.	2	.	.	.	.	5
Sphyrna tiburo	.	.	.	.	2	.	.	.	.	2	1	.	5
Stephanolepis hispidus	30	1	2	10	19	45	90	44	10	9	10	14	284
Strongylura marina	4	17	.	3	.	1	2	.	3	1	8	.	39
Strongylura notata	33	21	25	36	124	92	94	31	47	24	22	21	570
Strongylura spp.	1	.	.	2	1	8	2	1	.	.	.	.	15
Strongylura timucu	1	.	.	1	.	2	.	1	.	.	.	.	5
Symphurus plagiusa	21	12	11	19	.	3	.	11	18	14	8	14	131
Syngnathus floridae	12	4	1	8	5	9	2	6	6	2	6	11	72
Syngnathus louisianae	7	5	3	15	5	3	15	19	6	12	19	24	133

Appendix CH13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=89	E=1,068
Syngnathus scovelli	62	63	79	100	60	82	113	81	29	15	30	28	742
Trachinotus carolinus	2	3	1	.	.	.	.	8	1	.	.	24	39
Trachinotus falcatus	14	.	4	.	1	.	2	53	.	1	.	1	76
Trinectes maculatus	8	14	6	18	7	27	120	212	281	376	60	8	1,137
Tylosurus crocodilus	.	.	.	.	.	.	.	.	3	1	2	3	9
Totals	**14,338**	**18,486**	**9,440**	**18,165**	**33,905**	**17,092**	**17,371**	**18,325**	**32,026**	**12,316**	**25,352**	**16,212**	**233,028**

Appendix CH13-02. Summary by gear and stratum of species collected during Charlotte Harbor stratified-random sampling, 2013. Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or offshore) within 5-m. Offshore sets were further stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 21.3-m river seine and 183-m haul seine was stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Sampling with 6.1-m otter trawl was not stratified. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	**Gear and Strata**								**Totals**
	21.3-m bay seine			**21.3-m river seine**		**183-m haul seine**		**6.1-m otter trawl**	
	Veg	**Unveg**	**Shore**	**Over**	**Nonover**	**Over**	**Nonover**		
	E=142	**E=62**	**E=204**	**E=48**	**E=48**	**E=156**	**E=48**	**E=360**	**E=1,068**
Acanthostracion quadricornis	6	.	.	.	.	3	24	124	157
Achirus lineatus	3	6	13	4	1	2	.	99	128
Adinia xenica	.	.	1	6	97	.	.	.	104
Albula vulpes	1	.	14	.	.	.	.	.	15
Aluterus schoepfii	.	.	.	.	.	4	.	11	15
Ameiurus catus	.	.	.	.	.	.	.	33	33
Anarchopterus criniger	2	.	.	.	.	.	.	2	4
Anchoa hepsetus	13,098	60	8	.	292	.	.	36	13,494
Anchoa lyolepis	.	.	9	.	.	.	.	1	10
Anchoa mitchilli	5,806	2,523	14,068	26,948	11,042	.	.	8,732	69,119
Ancylopsetta quadrocellata	.	.	.	.	.	.	.	2	2
Archosargus probatocephalus	20	16	79	3	3	533	92	7	753
Argopecten gibbus	.	.	.	.	.	.	.	1	1
Ariopsis felis	10	5	.	.	1	3,468	292	609	4,385
Astroscopus y-graecum	.	1	.	.	.	.	.	.	1
Bagre marinus	.	.	.	.	.	2	2	57	61
Bairdiella chrysoura	1,046	18	644	2	1	130	113	949	2,903
Bathygobius soporator	.	.	11	49	13	.	.	.	73
Brevoortia spp.	1	.	.	.	.	2	2	.	5
Calamus penna	.	.	.	.	.	7	1	.	8
Calamus spp.	12	1	9	.	.	.	.	11	33
Callinectes ornatus	.	.	1	.	.	.	.	40	41
Callinectes sapidus	36	81	100	123	138	75	18	467	1,038
Caranx hippos	.	.	1	.	.	71	12	.	84
Carcharhinus leucas	.	.	.	.	.	2	.	.	2
Centropomus undecimalis	.	.	14	6	2	561	164	.	747

Appendix CH13-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=142	E=62	E=204	E=48	E=48	E=156	E=48	E=360	E=1,068
Centropristis striata	3	.	1	.	.	3	13	6	26
Chaetodipterus faber	.	.	.	.	.	112	405	37	554
Chasmodes saburrae	56	5	72	.	1	.	1	1	136
Chilomycterus schoepfii	24	2	7	.	.	196	118	282	629
Chloroscombrus chrysurus	9	.	1	.	.	.	.	108	118
Cichlasoma urophthalmus	.	.	.	.	2	1	.	.	3
Citharichthys macrops	.	2	1	.	.	.	4	25	32
Ctenogobius boleosoma	8	.	24	.	.	.	.	.	32
Cynoscion arenarius	26	83	51	5	13	.	.	2,391	2,569
Cynoscion nebulosus	290	43	154	10	2	40	10	28	577
Cyprinodon variegatus	7	29	533	16	6	.	.	.	591
Dasyatis americana	.	.	.	.	.	4	2	2	8
Dasyatis sabina	1	1	6	.	.	67	1	51	127
Dasyatis say	.	.	.	.	.	10	3	14	27
Diapterus auratus	.	.	.	.	.	57	3	.	60
Diplectrum formosum	1	.	.	.	.	.	3	44	48
Diplodus holbrookii	.	.	.	.	.	21	6	1	28
Echeneis neucratoides	.	.	1	.	.	.	.	.	1
Elops saurus	.	.	.	2	2	250	224	2	480
Epinephelus itajara	.	.	.	.	.	2	.	1	3
Epinephelus morio	.	.	.	.	.	2	.	.	2
Etropus crossotus	.	.	1	.	.	.	.	182	183
Eucinostomus gula	757	205	2,470	17	21	613	131	1,154	5,368
Eucinostomus harengulus	77	152	662	333	249	208	50	266	1,997
Eucinostomus spp.	9,016	1,125	17,210	1,013	409	.	.	408	29,181
Eugerres plumieri	5	3	95	45	57	64	11	30	310
Farfantepenaeus duorarum	812	104	1,051	29	3	9	1	557	2,566
Floridichthys carpio	202	.	561	.	.	4	.	.	767
Fundulus confluentus	.	.	2	.	7	.	.	.	9
Fundulus grandis	.	.	103	32	111	5	.	.	251
Fundulus seminolis	.	.	.	8	1	.	.	.	9

Appendix CH13-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=142	E=62	E=204	E=48	E=48	E=156	E=48	E=360	E=1,068
Fundulus similis	.	.	600	6	189	1	2	.	798
Gambusia holbrooki	.	.	1	61	35	.	.	.	97
Gobiesox strumosus	.	.	2	1	1	.	.	1	5
Gobionellus oceanicus	.	.	.	.	.	.	.	1	1
Gobiosoma bosc	.	.	5	11	3	.	.	.	19
Gobiosoma longipala	.	.	.	.	.	.	.	42	42
Gobiosoma robustum	336	50	582	10	1	.	.	43	1,022
Gobiosoma spp.	77	11	55	5	4	.	.	53	205
Gymnura micrura	.	.	.	.	.	4	1	2	7
Haemulon aurolineatum	.	.	.	.	.	1	1	.	2
Haemulon plumierii	15	.	11	.	.	6	17	5	54
Halichoeres bivittatus	.	.	.	.	.	.	1	.	1
Harengula jaguana	210	.	1,641	.	.	265	159	5	2,280
Hemicaranx amblyrhynchus	.	.	.	.	.	.	.	2	2
Hemichromis letourneuxi	.	.	2	.	7	.	.	.	9
Hippocampus erectus	1	.	.	.	.	.	.	28	29
Hippocampus zosterae	13	3	26	.	.	.	.	.	42
Hoplosternum littorale	.	.	.	.	.	2	.	.	2
Hypleurochilus caudovittatus	.	.	.	.	.	.	.	7	7
Hyporhamphus meeki	.	.	.	.	.	1	6	.	7
Hyporhamphus spp.	.	.	2	.	.	.	.	.	2
Hyporhamphus unifasciatus	2	.	.	.	.	.	.	.	2
Hypsoblennius hentz	5	.	2	.	.	.	.	.	7
Lagodon rhomboides	13,482	490	12,392	55	70	11,442	5,103	4,826	47,860
Leiostomus xanthurus	141	.	490	.	.	74	16	2	723
Lepisosteus osseus	.	.	.	.	.	1	.	2	3
Lepisosteus platyrhincus	.	.	.	1	.	.	2	.	3
Limulus polyphemus	2	.	1	.	.	19	2	16	40
Lophogobius cyprinoides	.	.	3	1	.	.	.	.	4
Lucania parva	6,820	38	6,676	15	76	.	.	.	13,625
Lutjanus analis	.	.	.	.	.	.	1	.	1
Lutjanus griseus	39	.	117	4	3	290	401	13	867
Lutjanus synagris	97	.	23	.	.	15	33	248	416

Appendix CH13-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=142	E=62	E=204	E=48	E=48	E=156	E=48	E=360	E=1,068
Membras martinica	.	1	114	6	3	.	.	.	124
Menidia spp.	207	12	2,948	941	830	.	.	.	4,938
Menippe spp.	2	.	.	.	.	.	1	403	406
Menticirrhus americanus	2	16	20	4	2	.	.	406	450
Menticirrhus littoralis	.	.	.	.	.	.	1	.	1
Menticirrhus saxatilis	2	2	6	.	.	.	3	1	14
Microgobius gulosus	937	209	1,137	42	11	.	.	19	2,355
Microgobius thalassinus	.	.	.	.	.	.	.	25	25
Micropogonias undulatus	.	.	.	.	.	.	.	4	4
Monacanthus ciliatus	2	.	1	.	.	1	1	4	9
Mugil cephalus	11	1	14	3	32	362	90	.	513
Mugil curema	.	.	261	.	.	134	31	.	426
Mugil trichodon	.	.	244	.	6	119	77	.	446
Mullus auratus								3	3
Mycteroperca microlepis	.	.	.	.	.	26	23	2	51
Myrophis punctatus	.	.	2	.	.	.	.	1	3
Nicholsina usta	7	.	1	.	.	12	40	35	95
Ocyurus chrysurus	1	.	.	.	.	.	1	.	2
Ogcocephalus cubifrons	.	.	.	.	.	2	1	29	32
Oligoplites saurus	27	11	70	9	16	18	10	.	161
Opisthonema oglinum	102	.	947	2	2	4	14	.	1,071
Opsanus beta	6	.	5	.	.	40	7	35	93
Oreochromis aureus	.	.	3	1	1	1	.	.	6
Orthopristis chrysoptera	1,198	35	344	13	.	171	712	1,825	4,298
Parablennius marmoreus	.	.	.	.	.	.	.	1	1
Paraclinus marmoratus	4	.	3	.	.	.	.	.	7
Paralichthys albigutta	1	3	.	.	.	38	8	25	75
Poecilia latipinna	.	.	15	14	426	.	.	.	455
Pogonias cromis	.	.	1	.	.	37	15	.	53
Pomatomus saltatrix	.	.	.	.	.	.	2	.	2
Portunus spp.	3	1	2	.	.	.	3	1,976	1,985
Prionotus scitulus	7	19	9	.	.	1	3	462	501
Prionotus tribulus	2	14	7	.	.	2	1	127	153
Rachycentron canadum	.	.	.	.	.	.	.	1	1

Appendix CH13-02. (Continued)

Species	**Gear and Strata**								**Totals**
	21.3-m bay seine			**21.3-m river seine**		**183-m haul seine**		**6.1-m otter trawl**	
	Veg	**Unveg**	**Shore**	**Over**	**Nonover**	**Over**	**Nonover**		
	E=142	**E=62**	**E=204**	**E=48**	**E=48**	**E=156**	**E=48**	**E=360**	**E=1,068**
Raja eglanteria	.	.	.	.	.	1	.	1	2
Rhinoptera bonasus	.	.	.	.	.	3	1	1	5
Rimapenaeus constrictus	5	.	.	.	.	.	.	21	26
Sardinella aurita	.	.	4	.	.	.	.	.	4
Sciaenops ocellatus	89	164	1,415	67	110	148	24	1	2,018
Scomberomorus maculatus	.	.	.	.	.	3	10	.	13
Scorpaena brasiliensis	.	.	.	.	.	.	1	6	7
Selene vomer	1	.	.	.	.	8	.	1	10
Serraniculus pumilio	.	.	.	.	.	.	.	3	3
Serranus subligarius	.	.	.	.	.	.	.	13	13
Sphoeroides nephelus	68	24	67	1	.	96	50	76	382
Sphoeroides spengleri	.	.	.	.	.	.	.	3	3
Sphyraena barracuda	.	.	.	.	.	26	.	.	26
Sphyraena borealis	3	3	3	.	.	.	.	.	9
Sphyraena guachancho	3	.	2	.	.	.	.	.	5
Sphyrna tiburo	.	.	.	.	.	3	2	.	5
Stephanolepis hispidus	38	2	4	.	.	28	10	202	284
Strongylura marina	.	.	4	.	.	5	30	.	39
Strongylura notata	13	2	272	26	21	210	26	.	570
Strongylura spp.	1	.	12	.	2	.	.	.	15
Strongylura timucu	.	.	3	.	.	.	2	.	5
Symphurus plagiusa	19	10	17	.	6	3	.	76	131
Syngnathus floridae	32	1	6	.	.	.	.	33	72
Syngnathus louisianae	30	3	27	.	.	.	.	73	133
Syngnathus scovelli	360	20	263	2	2	.	.	95	742
Synodus foetens	58	47	57	6	1	39	17	169	394
Trachinotus carolinus	1	.	.	.	.	32	6	.	39
Trachinotus falcatus	.	.	42	.	.	12	22	.	76
Trinectes maculatus	1	1	19	16	5	1	1	1,093	1,137
Tylosurus crocodilus	.	.	.	.	.	4	5	.	9
Totals	**55,818**	**5,658**	**68,980**	**29,974**	**14,339**	**20,239**	**8,702**	**29,318**	**233,028**

Appendix CH13-03. Summary by zone of species collected during Charlotte Harbor stratified-random sampling, 2013. Zones A-D were located in Charlotte Harbor, while Zones M (Myakka River) and P (Peace River) represent tributaries of Charlotte Harbor. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	**Zone**						**Totals**
	A	**B**	**C**	**D**	**M**	**P**	
	E=264	**E=216**	**E=216**	**E=204**	**E=84**	**E=84**	**E=1,068**
Acanthostracion quadricornis	.	55	23	79	.	.	157
Achirus lineatus	15	35	21	51	1	5	128
Adinia xenica	1	.	.	.	87	16	104
Albula vulpes	9	.	.	6	.	.	15
Aluterus schoepfii	.	7	2	6	.	.	15
Ameiurus catus	.	.	.	.	.	33	33
Anarchopterus criniger	.	2	2	.	.	.	4
Anchoa hepsetus	3	13,113	21	62	292	3	13,494
Anchoa lyolepis	.	1	.	9	.	.	10
Anchoa mitchilli	8,952	7,015	12,133	248	15,167	25,604	69,119
Ancylopsetta quadrocellata	.	.	.	2	.	.	2
Archosargus probatocephalus	83	224	268	171	7	.	753
Argopecten gibbus	.	1	.	.	.	.	1
Ariopsis felis	283	47	241	3,320	399	95	4,385
Astroscopus y-graecum	1	.	.	.	.	.	1
Bagre marinus	6	.	2	1	25	27	61
Bairdiella chrysoura	1,108	269	673	422	95	336	2,903
Bathygobius soporator	9	.	2	.	1	61	73
Brevoortia spp.	.	1	.	4	.	.	5
Calamus penna	.	7	1	.	.	.	8
Calamus spp.	1	11	7	14	.	.	33
Callinectes ornatus	6	27	3	5	.	.	41
Callinectes sapidus	272	106	111	73	191	285	1,038
Caranx hippos	5	21	24	34	.	.	84
Carcharhinus leucas	2	.	.	.	.	.	2
Centropomus undecimalis	77	297	270	95	4	4	747
Centropristis striata	.	6	4	16	.	.	26
Chaetodipterus faber	16	430	91	9	.	8	554
Chasmodes saburrae	10	37	62	25	2	.	136
Chilomycterus schoepfii	29	178	204	218	.	.	629

Appendix CH13-03. (Continued)

Species	Zone						Totals
	A	B	C	D	M	P	
	E=264	E=216	E=216	E=204	E=84	E=84	E=1,068
Chloroscombrus chrysurus	15	5	84	12	1	1	118
Cichlasoma urophthalmus	.	.	.	1	1	1	3
Citharichthys macrops	1	20	5	6	.	.	32
Ctenogobius boleosoma	.	1	1	30	.	.	32
Cynoscion arenarius	1,087	6	111	1	621	743	2,569
Cynoscion nebulosus	249	94	151	64	12	7	577
Cyprinodon variegatus	1	8	160	400	21	1	591
Dasyatis americana	.	1	2	5	.	.	8
Dasyatis sabina	21	23	49	9	7	18	127
Dasyatis say	.	9	16	2	.	.	27
Diapterus auratus	49	7	2	2	.	.	60
Diplectrum formosum	3	12	7	26	.	.	48
Diplodus holbrookii	.	22	.	6	.	.	28
Echeneis neucratoides	1	.	.	.	.	.	1
Elops saurus	212	202	12	50	.	4	480
Epinephelus itajara	.	1	1	.	.	1	3
Epinephelus morio	.	2	.	.	.	.	2
Etropus crossotus	31	27	96	29	.	.	183
Eucinostomus gula	516	1,922	916	1,975	25	14	5,368
Eucinostomus harengulus	517	194	223	477	399	187	1,997
Eucinostomus spp.	2,786	11,677	5,458	7,824	1,122	314	29,181
Eugerres plumieri	122	21	34	1	99	33	310
Farfantepenaeus duorarum	619	697	800	342	36	72	2,566
Floridichthys carpio	117	98	234	318	.	.	767
Fundulus confluentus	.	1	1	.	5	2	9
Fundulus grandis	47	33	11	17	56	87	251
Fundulus seminolis	.	.	.	.	.	9	9
Fundulus similis	2	15	214	372	154	41	798
Gambusia holbrooki	.	1	.	.	45	51	97
Gobiesox strumosus	2	.	.	.	1	2	5
Gobionellus oceanicus	.	.	.	.	1	.	1
Gobiosoma bosc	5	.	.	.	4	10	19
Gobiosoma longipala	.	34	6	2	.	.	42

Appendix CH13-03. (Continued)

Species	**Zone**						**Totals**
	A	**B**	**C**	**D**	**M**	**P**	
	E=264	**E=216**	**E=216**	**E=204**	**E=84**	**E=84**	**E=1,068**
Gobiosoma robustum	141	344	279	246	2	10	1,022
Gobiosoma spp.	32	29	94	11	33	6	205
Gymnura micrura	1	2	1	2	.	1	7
Haemulon aurolineatum	.	1	.	1	.	.	2
Haemulon plumierii	.	31	.	23	.	.	54
Halichoeres bivittatus	.	.	.	1	.	.	1
Harengula jaguana	292	168	203	1,617	.	.	2,280
Hemicaranx amblyrhynchus	2	.	.	.	.	.	2
Hemichromis letourneuxi	2	.	.	.	2	5	9
Hippocampus erectus	1	13	11	4	.	.	29
Hippocampus zosterae	4	12	6	20	.	.	42
Hoplosternum littorale	2	.	.	.	.	.	2
Hypleurochilus caudovittatus	.	.	1	6	.	.	7
Hyporhamphus meeki	.	.	6	1	.	.	7
Hyporhamphus spp.	1	1	.	.	.	.	2
Hyporhamphus unifasciatus	.	.	2	.	.	.	2
Hypsoblennius hentz	2	.	.	5	.	.	7
Lagodon rhomboides	3,041	18,667	9,331	16,673	71	77	47,860
Leiostomus xanthurus	3	131	27	562	.	.	723
Lepisosteus osseus	1	.	.	.	.	2	3
Lepisosteus platyrhincus	2	.	.	.	1	.	3
Limulus polyphemus	9	6	7	4	10	4	40
Lophogobius cyprinoides	.	.	3	.	.	1	4
Lucania parva	767	4,516	2,359	5,892	86	5	13,625
Lutjanus analis	.	.	1	.	.	.	1
Lutjanus griseus	28	276	259	297	3	4	867
Lutjanus synagris	15	108	108	185	.	.	416
Membras martinica	67	.	.	48	.	9	124
Menidia spp.	425	552	1,340	850	1,134	637	4,938
Menippe spp.	1	200	76	129	.	.	406
Menticirrhus americanus	173	3	31	1	23	219	450
Menticirrhus littoralis	.	.	.	1	.	.	1
Menticirrhus saxatilis	4	7	1	2	.	.	14

Appendix CH13-03. (Continued)

Species	Zone						Totals
	A	B	C	D	M	P	
	E=264	E=216	E=216	E=204	E=84	E=84	E=1,068
Microgobius gulosus	567	477	914	330	51	16	2,355
Microgobius thalassinus	6	.	.	.	.	19	25
Micropogonias undulatus	.	.	.	.	.	4	4
Monacanthus ciliatus	.	7	.	2	.	.	9
Mugil cephalus	168	91	155	64	32	3	513
Mugil curema	36	32	250	108	.	.	426
Mugil trichodon	34	28	76	302	6	.	446
Mullus auratus				3			3
Mycteroperca microlepis	.	39	3	9	.	.	51
Myrophis punctatus	2	1	.	.	.	.	3
Nicholsina usta	.	21	7	67	.	.	95
Ocyurus chrysurus	.	1	.	1	.	.	2
Ogcocephalus cubifrons	1	13	8	10	.	.	32
Oligoplites saurus	46	33	36	21	18	7	161
Opisthonema oglinum	5	.	5	1,057	2	2	1,071
Opsanus beta	5	24	11	52	.	1	93
Oreochromis aureus	4	.	.	.	1	1	6
Orthopristis chrysoptera	69	2,308	616	1,291	2	12	4,298
Parablennius marmoreus	.	1	.	.	.	.	1
Paraclinus marmoratus	.	.	.	7	.	.	7
Paralichthys albigutta	12	19	26	17	.	1	75
Poecilia latipinna	11	.	1	3	419	21	455
Pogonias cromis	3	30	16	4	.	.	53
Pomatomus saltatrix	.	1	.	1	.	.	2
Portunus spp.	149	1,310	295	227	1	3	1,985
Prionotus scitulus	113	186	90	104	4	4	501
Prionotus tribulus	94	8	13	1	13	24	153
Rachycentron canadum	.	.	1	.	.	.	1
Raja eglanteria	.	2	.	.	.	.	2
Rhinoptera bonasus	3	.	2	.	.	.	5
Rimapenaeus constrictus	3	10	13	.	.	.	26
Sardinella aurita	.	4	.	.	.	.	4
Sciaenops ocellatus	1,192	300	311	37	118	60	2,018
Scomberomorus maculatus	.	3	.	10	.	.	13

Appendix CH13-03. (Continued)

Species	Zone						Totals
	A	B	C	D	M	P	
	E=264	E=216	E=216	E=204	E=84	E=84	E=1,068
Scorpaena brasiliensis	.	2	1	4	.	.	7
Selene vomer	.	7	2	1	.	.	10
Serraniculus pumilio	.	2	1	.	.	.	3
Serranus subligarius	.	7	.	6	.	.	13
Sphoeroides nephelus	63	97	114	105	.	3	382
Sphoeroides spengleri	.	2	.	1	.	.	3
Sphyraena barracuda	.	11	.	15	.	.	26
Sphyraena borealis	3	3	.	3	.	.	9
Sphyraena guachancho	.	.	5	.	.	.	5
Sphyrna tiburo	1	3	.	1	.	.	5
Stephanolepis hispidus	7	112	20	145	.	.	284
Strongylura marina	4	4	24	7	.	.	39
Strongylura notata	71	136	143	173	45	2	570
Strongylura spp.	4	7	1	1	1	1	15
Strongylura timucu	.	3	2	.	.	.	5
Symphurus plagiusa	75	8	18	7	.	23	131
Syngnathus floridae	1	33	5	32	1	.	72
Syngnathus louisianae	18	33	44	34	1	3	133
Syngnathus scovelli	160	164	210	179	27	2	742
Synodus foetens	105	119	87	76	5	2	394
Trachinotus carolinus	3	35	1	.	.	.	39
Trachinotus falcatus	.	29	.	47	.	.	76
Trinectes maculatus	423	45	50	3	298	318	1,137
Tylosurus crocodilus	.	6	.	3	.	.	9
Totals	**25,768**	**67,907**	**40,482**	**47,993**	**21,291**	**29,587**	**233,028**

Northern Indian River Lagoon

The sampling area identified as the northern Indian River Lagoon (IRL) system is a narrow estuary located along the eastern central coast of Florida which extends from the northern terminus of the Indian River Lagoon proper south to Vero Beach. The northern IRL is connected to the Atlantic Ocean by one permanent inlet (Sebastian Inlet) and one intermittently open conduit via the Canaveral Locks that links the Banana River to the Atlantic Ocean just south of Cape Canaveral. Freshwater inflow primarily comes from the St. Sebastian River and from numerous creeks located mainly along the western shoreline (Paperno and Brodie 2004). Shoreline vegetation consists largely of fringing mangrove, Brazilian pepper, and marsh grasses. Bottom substrates are typically characterized as sand or mud mixed with shell hash and occasional oysters. Seagrasses, primarily *Halodule wrightii*, are the dominant vegetative cover in the northern IRL (Steward et al. 2006).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in the northern IRL since 1990. The area sampled was divided into six geographically-defined bay zones (A-E, and H) and one riverine zone (F; Figure IR13-01). Monthly stratified-random sampling (SRS) was conducted in Zones C, D, and H using 21.3-m bay and 183-m haul seines. Zone H was also sampled monthly with 6.1-m bay otter trawls. Monthly SRS was conducted in Zone E with only 183-m haul seines. Zone F was sampled monthly with 21.3-m river seines. Zones A, B, and E were sampled seasonally (October and November) with 21.3-m bay seines. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2013 in the northern IRL.

Stratified-Random Sampling

A total of 437,013 animals, which included 162 taxa of fishes and 14 taxa of selected invertebrates, were collected from 812 northern IRL samples in 2013 (Table IR13-01; Appendices IR13-01, -02, and -03). *Anchoa mitchilli* (n=298,297) was the most numerous species collected, representing 68.3% of the total catch. The three next most abundant taxa, *Eucinostomus* spp. (n=24,052), *Diapterus auratus* (n=14,075), and *Harengula jaguana* (n=13,308) accounted for an additional 11.8% of the total catch. Thirty-two Selected Taxa (n=23,763 animals) composed 5.4% of the total catch. *Mugil curema* (n=8,357) and *Mugil cephalus* (n=5,036) were the most abundant Selected Taxa, representing 3.1% of the total catch. *Archosargus probatocephalus* (n=2,803), *Leiostomus xanthurus* (n=1,397), and *Farfantepenaeus* spp. (n=1,236) were the next most abundant Selected Taxa, accounting for an additional 1.2% of the total catch. Collections in 2013 included several species new to the northern IRL FIM collection: *Aluterus monoceros* (Unicorn Filefish), *Anchoa lamprotaenia* (Bigeye Anchovy), *Bothus robinsi* (Two Spot Flounder), *Centropristis striata* (Black Sea Bass), *Eucinostomus melanopterus* (Flagfin Mojarra), *Hypoatherina harringtonensis* (Reef Silverside), *Mercenaria mercenaria* (Quahog), and *Seriola rivoliana* (Almaco Jack).

Bay Sampling

21.3-m Bay Seines. A total of 135,887 animals were collected in 380 21.3-m bay seines, representing 31.1% of the overall SRS catch (Table IR13-01). *Anchoa mitchilli* (n=88,174) was the most abundant species, accounting for 64.9% of the animals collected in 21.3-m bay seine catch (Table IR13-02). The taxa most frequently caught in the 21.3-m bay seines were *Microgobius gulosus* (45.5% occurrence), *Eucinostomus* spp. (42.9% occurrence), *A. mitchilli* (38.4% occurrence), and *Menidia* spp. (35.0% occurrence).

A total of 3,082 animals from 27 Selected Taxa were collected, representing 2.3% of the entire 21.3-m bay seine catch (Table IR13-03). *Farfantepenaeus* spp. (n=565), *M. cephalus* (n=497), and *Sciaenops ocellatus* (n=445) were the most abundant Selected Taxa, accounting for 48.9% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 21.3-m bay seines were *A. probatocephalus* (22.6% occurrence), *Farfantepenaeus* spp. (21.6% occurrence), *M. curema* (18.7% occurrence), and *Cynoscion nebulosus* (17.1% occurrence).

183-m Haul Seines. A total of 46,778 animals were collected in 228 183-m haul seines, representing 10.7% of the overall SRS catch (Table IR13-01). *Mugil curema* (n=6,775), *D. auratus* (n=6,433), *Eucinostomus harengulus* (n=5,791), and *M. cephalus* (n=4,416) were the most abundant species, accounting for 50.1% of the 183-m haul seine catch (Table IR13-04). The taxa most frequently caught in the 183-m haul seines were *M. cephalus* (83.8% occurrence) and *M. curema* (82.9% occurrence).

A total of 17,044 animals from 30 Selected Taxa were collected, representing 36.4% of the entire 183-m haul seine catch (Table IR13-05). *Mugil curema* (n=6,775) and *M. cephalus* (n=4,416) were the most abundant Selected Taxa, accounting for 65.7% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in the 183-m haul seines were *M. cephalus* (83.8% occurrence), *M. curema* (82.9% occurrence), and *A. probatocephalus* (70.6% occurrence).

6.1-m Bay Otter Trawls. A total of 6,258 animals were collected in 96 6.1-m bay otter trawls, representing 1.4% of the overall SRS catch (Table IR13-01). *Gobiosoma* spp. (n=1,272), *Gobiosoma robustum* (n=1,023), and *Eucinostomus* spp. (n=727) were the most abundant species, accounting for 48.3% of the 6.1-m bay otter trawl catch (Table IR13-06). The taxa most frequently caught in 6.1-m bay otter trawls were *Gobiosoma* spp. (55.2% occurrence), *G. robustum* (55.2% occurrence), *Syngnathus scovelli* (55.2% occurrence), and *Eucinostomus* spp. (52.1% occurrence).

A total of 818 animals from 18 Selected Taxa were collected, representing 13.1% of the entire 6.1-m bay otter trawl catch (Table IR13-07). *Farfantepenaeus* spp. (n=363), *Callinectes sapidus* (n=140), and *A. probatocephalus* (n=102) were the most abundant Selected Taxa, accounting for 73.9% of the Selected Taxa collected in this gear. The Selected Taxa most frequently caught in the 6.1-m bay otter trawl were *Farfantepenaeus* spp. (45.8% occurrence), *C. sapidus* (44.8% occurrence), and *A. probatocephalus* (31.3% occurrence).

River Sampling

21.3-m River Seines. A total of 248,090 animals were collected in 108 21.3-m river seines, representing 56.8% of the overall SRS collections (Table IR13-01). *Anchoa mitchilli* (n=209,809) was the most abundant species collected, accounting for 84.6% of the 21.3-m river seine catch (Table IR13-08). The taxa most frequently caught in 21.3-m river seines were *Eucinostomus* spp. (83.3% occurrence), *D. auratus* (73.1% occurrence), and *E. harengulus* (72.2% occurrence).

A total of 2,819 animals from 21 Selected Taxa were collected, representing 1.1% of the entire 21.3-m river seine catch (Table IR13-09). *Mugil curema* (n=1,211), *Centropomus undecimalis* (n=568), and *Farfantepenaeus* spp. (n=301) were the most abundant Selected Taxa, accounting for 73.8% of the Selected Taxa collected in this gear. The Selected Taxa most frequently caught in 21.3-m river seines were *C. undecimalis* (50.0% occurrence), *Farfantepenaeus* spp. (41.7% occurrence), and *A. probatocephalus* (36.1% occurrence)

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Figure IR13-01. Map of the northern Indian River Lagoon sampling area. Zones are labeled A – F, and H.

Table IR13-01. Summary of catch and effort data for Northern Indian River Lagoon stratified-random sampling, 2013.

Zone	21.3-m bay seine		21.3-m river seine		183-m haul seine		6.1-m otter trawl		Totals	
	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls
A	2,544	16	.	.	.	.	.	.	2,544	16
B	2,403	14	.	.	.	.	.	.	2,403	14
C	74,390	120	.	.	14,813	48	.	.	89,203	168
D	12,171	96	.	.	9,600	72	.	.	21,771	168
E	5,468	14	.	.	8,758	48	.	.	14,226	62
F	.	.	248,090	108	.	.	.	.	248,090	108
H	38,911	120	.	.	13,607	60	6,258	96	58,776	276
Totals	**135,887**	**380**	**248,090**	**108**	**46,778**	**228**	**6,258**	**96**	**437,013**	**812**

Table IR13-02. Catch statistics for 10 dominant taxa collected in 380 21.3-m bay seine samples during Northern Indian River Lagoon stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	88,174	64.9	38.4	165.74	52.79	620.94	17,877.14	33	0.03	14	64
Harengula jaguana	8,624	6.4	7.1	16.21	8.20	986.66	2,496.43	45	0.20	22	91
Eucinostomus spp.	7,774	5.7	42.9	14.61	2.36	315.40	547.86	25	0.08	10	39
Menidia spp.	4,280	3.2	35.0	8.05	1.56	377.15	388.57	42	0.17	12	88
Brevoortia spp.	2,935	2.2	8.2	5.52	3.07	1,084.25	954.29	36	0.19	17	97
Floridichthys carpio	2,610	1.9	17.6	4.91	2.01	797.23	653.57	29	0.24	9	63
Microgobius gulosus	2,105	1.6	45.5	3.96	0.67	330.22	172.14	27	0.16	13	54
Lucania parva	1,886	1.4	13.9	3.55	1.22	672.30	380.00	23	0.10	8	35
Eucinostomus gula	1,840	1.4	18.7	3.46	0.80	452.46	182.14	58	0.32	40	120
Gobiosoma spp.	1,627	1.2	29.2	3.06	0.82	523.35	262.86	16	0.06	7	19
Subtotal	121,855	89.7	.	.	.	.	.	.	.	7	120
Totals	**135,887**	**100.0**	**.**	**255.43**	**54.19**	**413.53**	**17,890.00**	**.**	**.**	**3**	**637**

Table IR13-03. Catch statistics for Selected Taxa collected in 380 21.3-m bay seine samples during Northern Indian River Lagoon stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Farfantepenaeus spp.	565	0.4	21.6	1.06	0.23	423.75	52.14	7	0.13	3	14
Mugil cephalus	497	0.4	10.8	0.93	0.54	1,132.29	197.86	41	2.49	18	331
Sciaenops ocellatus	445	0.3	12.6	0.84	0.29	672.21	90.00	34	2.01	11	442
Mugil curema	371	0.3	18.7	0.70	0.21	592.23	71.43	60	2.13	16	215
Archosargus probatocephalus	264	0.2	22.6	0.50	0.11	417.50	30.71	72	4.24	8	382
Leiostomus xanthurus	251	0.2	5.0	0.47	0.28	1,145.39	97.14	31	0.99	15	106
Cynoscion nebulosus	214	0.2	17.1	0.40	0.07	320.60	12.14	36	1.71	15	294
Micropogonias undulatus	149	0.1	4.2	0.28	0.11	778.62	31.43	24	0.78	13	64
Menticirrhus americanus	69	0.1	7.4	0.13	0.04	537.09	8.57	38	3.94	14	271
Trachinotus falcatus	54	<0.1	2.6	0.10	0.04	805.29	9.29	31	1.46	11	48
Litopenaeus setiferus	37	<0.1	4.2	0.07	0.03	784.96	9.29	10	1.03	4	27
Callinectes sapidus	32	<0.1	4.2	0.06	0.02	607.86	4.29	49	8.54	7	145
Lutjanus griseus	26	<0.1	4.2	0.05	0.01	542.52	2.14	92	15.72	15	224
Farfantepenaeus duorarum	23	<0.1	2.4	0.04	0.02	1,092.14	8.57	17	0.38	15	21
Albula vulpes	20	<0.1	2.4	0.04	0.02	856.11	5.00	48	3.57	28	78
Paralichthys albigutta	20	<0.1	2.9	0.04	0.02	1,018.69	7.14	64	12.44	18	221
Pogonias cromis	11	<0.1	2.6	0.02	0.01	631.91	1.43	256	25.76	41	362

Table IR13-03. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Farfantepenaeus aztecus	8	<0.1	1.8	0.02	0.01	765.04	1.43	18	0.76	15	21
Elops saurus	7	<0.1	1.1	0.01	0.01	1,075.32	2.14	264	38.54	40	329
Mugil rubrioculus	5	<0.1	1.1	0.01	0.00	1,028.00	1.43	99	15.88	56	153
Scomberomorus regalis	4	<0.1	0.3	0.01	0.01	1,949.36	2.86	102	3.33	98	112
Centropomus undecimalis	3	<0.1	0.8	0.01	<0.01	1,122.49	0.71	168	78.50	45	314
Menippe spp.	2	<0.1	0.5	<0.01	<0.01	1,376.59	0.71	34	16.50	17	50
Pomatomus saltatrix	1	<0.1	0.3	<0.01	<0.01	1,949.36	0.71	43	.	43	43
Lutjanus analis	1	<0.1	0.3	<0.01	<0.01	1,949.36	0.71	34	.	34	34
Cynoscion complex	1	<0.1	0.3	<0.01	<0.01	1949.36	0.71	30	.	30	30
Scomberomorus maculatus	1	<0.1	0.3	<0.01	<0.01	1,949.36	0.71	40	.	40	40
Paralichthys lethostigma	1	<0.1	0.3	<0.01	<0.01	1,949.36	0.71	288	.	288	288
Totals	**3,082**	**2.3**	**.**	**5.79**	**0.89**	**297.82**	**205.00**	**.**	**.**	**3**	**442**

Table IR13-04. Catch statistics for 10 dominant taxa collected in 228 183-m haul seine samples during Northern Indian River Lagoon stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil curema	6,775	14.5	82.9	29.71	10.59	537.92	2,390.00	154	0.35	61	271
Diapterus auratus	6,433	13.8	34.2	28.21	13.27	710.15	2,466.00	121	0.27	44	221
Eucinostomus harengulus	5,791	12.4	54.4	25.40	5.86	348.35	961.00	106	0.16	40	166
Mugil cephalus	4,416	9.4	83.8	19.37	2.17	169.44	266.00	228	0.66	97	424
Harengula jaguana	4,365	9.3	9.2	19.14	8.16	643.31	1,247.00	109	0.17	49	139
Lagodon rhomboides	4,301	9.2	50.9	18.86	3.13	250.74	288.00	124	0.46	41	231
Archosargus probatocephalus	2,326	5.0	70.6	10.20	1.39	205.19	139.00	195	1.44	37	460
Eucinostomus gula	2,099	4.5	32.5	9.21	2.85	467.01	418.00	86	0.24	48	121
Ariopsis felis	1,430	3.1	53.5	6.27	1.04	250.07	127.00	257	1.36	55	407
Leiostomus xanthurus	955	2.0	18.4	4.19	1.58	567.93	257.00	133	1.16	50	243
Subtotal	38,891	83.1	.	.	.	.	.	.	.	37	460
Totals	**46,778**	**100.0**	**.**	**205.17**	**22.19**	**163.32**	**2,666.00**	**.**	**.**	**13**	**938**

Table IR13-05. Catch statistics for Selected Taxa collected in 228 183-m haul seine samples during Northern Indian River Lagoon stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Mugil curema	6,775	14.5	82.9	29.71	10.59	537.92	2,390.00	154	0.35	61	271
Mugil cephalus	4,416	9.4	83.8	19.37	2.17	169.44	266.00	228	0.66	97	424
Archosargus probatocephalus	2,326	5.0	70.6	10.20	1.39	205.19	139.00	195	1.44	37	460
Leiostomus xanthurus	955	2.0	18.4	4.19	1.58	567.93	257.00	133	1.16	50	243
Pogonias cromis	732	1.6	22.8	3.21	1.19	560.40	222.00	314	2.94	169	885
Elops saurus	620	1.3	37.3	2.72	0.70	391.08	132.00	276	1.90	162	480
Sciaenops ocellatus	458	1.0	54.4	2.01	0.23	170.28	19.00	302	6.22	61	938
Menticirrhus americanus	171	0.4	19.3	0.75	0.29	589.60	64.00	206	2.18	85	290
Trachinotus falcatus	113	0.2	7.0	0.50	0.22	672.67	44.00	169	6.82	28	357
Centropomus undecimalis	112	0.2	14.0	0.49	0.16	483.21	30.00	596	22.45	76	932
Cynoscion nebulosus	88	0.2	17.1	0.39	0.09	369.64	16.00	303	12.72	42	566
Lutjanus griseus	68	0.2	9.6	0.30	0.09	454.84	12.00	168	4.63	89	258
Callinectes sapidus	47	0.1	11.0	0.21	0.06	408.94	8.00	105	6.24	30	196
Lutjanus analis	36	0.1	2.2	0.16	0.09	884.07	17.00	131	5.14	39	173
Pomatomus saltatrix	32	0.1	3.9	0.14	0.07	740.98	12.00	167	23.38	110	772
Farfantepenaeus aztecus	27	0.1	2.2	0.12	0.08	963.96	14.00	20	0.51	15	24
Mugil rubrioculus	10	<0.1	3.5	0.04	0.02	557.28	2.00	131	8.41	96	188

Table IR13-05. (Continued)

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Paralichthys albigutta	9	<0.1	3.5	0.04	0.01	548.59	2.00	169	29.37	85	364
Farfantepenaeus duorarum	9	<0.1	3.1	0.04	0.02	597.91	2.00	20	1.58	16	29
Farfantepenaeus spp.	7	<0.1	3.1	0.03	0.01	563.12	1.00	14	0.18	13	14
Albula vulpes	6	<0.1	0.9	0.03	0.02	1,282.14	5.00	235	7.63	198	249
Trachinotus carolinus	5	<0.1	1.8	0.02	0.01	794.46	2.00	211	43.27	78	318
Menippe spp.	5	<0.1	0.9	0.02	0.02	1,243.86	4.00	30	5.82	18	49
Lutjanus synagris	4	<0.1	1.8	0.02	0.01	749.98	1.00	94	18.69	39	119
Micropogonias undulatus	4	<0.1	1.8	0.02	0.01	749.98	1.00	179	16.97	148	217
Megalops atlanticus	2	<0.1	0.9	0.01	0.01	1,065.35	1.00	532	6.00	526	538
Scomberomorus maculatus	2	<0.1	0.9	0.01	0.01	1,065.35	1.00	454	131.00	323	585
Scomberomorus regalis	2	<0.1	0.9	0.01	0.01	1,065.35	1.00	298	69.50	228	367
Panulirus argus	1	<0.1	0.4	<0.01	<0.01	1,509.97	1.00	28	.	28	28
Cynoscion complex	1	<0.1	0.4	<0.01	<0.01	1509.97	1.00	214	.	214	214
Paralichthys lethostigma	1	<0.1	0.4	<0.01	<0.01	1,509.97	1.00	278	.	278	278
Totals	**17,044**	**36.4**	**.**	**74.75**	**12.24**	**247.28**	**2,658.00**	**.**	**.**	**13**	**938**

Table IR13-06. Catch statistics for 10 dominant taxa collected in 96 6.1-m bay otter trawl samples during Northern Indian River Lagoon stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Gobiosoma spp.	1,272	20.3	55.2	2.74	0.67	240.34	43.62	16	0.06	7	19
Gobiosoma robustum	1,023	16.4	55.2	2.25	0.41	179.00	17.54	25	0.10	20	38
Eucinostomus spp.	727	11.6	52.1	1.58	0.41	254.93	21.97	21	0.25	10	39
Farfantepenaeus spp.	363	5.8	45.8	0.78	0.21	256.57	13.68	8	0.13	3	14
Callinectes ornatus	353	5.6	42.7	0.75	0.18	234.50	11.37	39	1.11	7	94
Syngnathus scovelli	342	5.5	55.2	0.73	0.12	159.93	5.97	65	0.61	39	107
Anchoa mitchilli	314	5.0	10.4	0.65	0.31	472.40	24.96	26	0.34	19	38
Lagodon rhomboides	270	4.3	38.5	0.62	0.21	329.28	12.59	38	2.04	13	143
Orthopristis chrysoptera	242	3.9	43.8	0.52	0.11	213.89	8.09	68	3.89	11	184
Callinectes sapidus	140	2.2	44.8	0.30	0.06	184.60	2.47	80	4.59	9	187
Subtotal	5,046	80.7	.	.	.	.	.	.	.	3	187
Totals	**6,258**	**100.0**	**.**	**13.46**	**1.38**	**100.46**	**77.35**	**.**	**.**	**3**	**606**

Table IR13-07. Catch statistics for Selected Taxa collected in 96 6.1-m bay otter trawl samples during Northern Indian River Lagoon stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Farfantepenaeus spp.	363	5.8	45.8	0.78	0.21	256.57	13.68	8	0.13	3	14
Callinectes sapidus	140	2.2	44.8	0.30	0.06	184.60	2.47	80	4.59	9	187
Archosargus probatocephalus	102	1.6	31.3	0.23	0.06	263.23	4.32	27	3.15	9	203
Micropogonias undulatus	35	0.6	5.2	0.06	0.05	757.78	4.55	12	0.72	6	23
Lutjanus griseus	28	0.5	14.6	0.06	0.02	295.22	0.96	65	12.02	11	202
Farfantepenaeus duorarum	28	0.5	11.5	0.06	0.02	340.66	1.35	17	0.40	15	22
Sciaenops ocellatus	20	0.3	8.3	0.04	0.02	446.71	1.35	26	3.03	15	78
Paralichthys albigutta	18	0.3	13.5	0.04	0.01	312.55	0.90	209	17.01	34	317
Cynoscion nebulosus	17	0.3	10.4	0.03	0.01	325.39	0.58	43	13.14	19	237
Elops saurus	17	0.3	2.1	0.03	0.03	843.41	2.53	41	0.65	35	44
Menippe spp.	13	0.2	10.4	0.03	0.01	329.53	0.58	42	11.54	8	110
Lutjanus synagris	9	0.1	5.2	0.02	0.01	467.10	0.58	76	7.61	48	110
Menticirrhus americanus	8	0.1	7.3	0.02	0.01	375.37	0.39	82	35.81	18	261
Litopenaeus setiferus	6	0.1	3.1	0.02	0.01	717.79	1.08	5	0.60	3	7
Lutjanus analis	6	0.1	3.1	0.01	0.01	668.50	0.67	43	6.73	30	74
Farfantepenaeus aztecus	5	0.1	5.2	0.01	<0.01	431.54	0.22	16	0.58	15	18
Cynoscion complex	1	<0.1	1.0	<0.01	<0.01	979.80	0.19	20	.	20	20
Panulirus argus	1	<0.1	1.0	<0.01	<0.01	979.80	0.17	15	.	15	15
Lutjanus jocu	1	<0.1	1.0	<0.01	<0.01	979.80	0.17	36	.	36	36
Totals	**818**	**13.1**	**.**	**1.74**	**0.30**	**166.78**	**15.80**	**.**	**.**	**3**	**317**

Table IR13-08. Catch statistics for 10 dominant taxa collected in 108 21.3-m river seine samples during Northern Indian River Lagoon stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	209,809	84.6	52.8	2,856.88	1,674.83	609.24	169,179.41	32	0.01	17	57
Eucinostomus spp.	15,551	6.3	83.3	211.75	64.91	318.57	5,838.24	23	0.06	11	39
Diapterus auratus	5,960	2.4	73.1	81.15	16.02	205.16	1,098.53	35	0.18	11	158
Brevoortia spp.	2,912	1.2	26.9	39.65	20.28	531.47	2,045.59	26	0.15	19	56
Menidia spp.	2,126	0.9	58.3	28.95	8.34	299.54	714.71	35	0.17	19	61
Eucinostomus harengulus	1,411	0.6	72.2	19.21	2.54	137.29	120.59	55	0.33	40	112
Gambusia holbrooki	1,217	0.5	38.9	16.57	4.85	304.41	297.06	25	0.15	9	42
Mugil curema	1,211	0.5	16.7	16.49	14.82	934.08	1,600.00	27	0.43	18	221
Anchoa lyolepis	1,047	0.4	3.7	14.26	10.74	782.54	1,064.71	38	0.14	32	58
Opisthonema oglinum	939	0.4	8.3	12.79	11.15	906.08	1,202.94	41	0.16	26	74
Subtotal	242,183	97.6	.	.	.	.	.	.	.	9	221
Totals	**248,090**	**100.0**	**.**	**3,378.13**	**1,684.93**	**518.34**	**170,792.65**	**.**	**.**	**2**	**731**

Table IR13-09. Catch statistics for Selected Taxa collected in 108 21.3-m river seine samples during Northern Indian River Lagoon stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil curema	1,211	0.5	16.7	16.49	14.82	934.08	1,600.00	27	0.43	18	221
Centropomus undecimalis	568	0.2	50.0	7.73	1.95	262.38	126.47	41	1.57	14	363
Farfantepenaeus spp.	301	0.1	41.7	4.10	1.09	275.36	95.59	8	0.16	2	14
Leiostomus xanthurus	191	0.1	5.6	2.60	1.74	696.94	133.82	24	0.62	13	54
Mugil cephalus	123	0.1	18.5	1.67	0.91	565.67	94.12	46	5.19	18	243
Sciaenops ocellatus	122	0.1	12.0	1.66	0.98	613.57	102.94	23	0.92	12	97
Archosargus probatocephalus	111	<0.1	36.1	1.51	0.28	193.44	16.18	80	6.13	14	323
Callinectes sapidus	54	<0.1	27.8	0.74	0.20	287.43	19.12	32	5.28	6	162
Lutjanus griseus	36	<0.1	21.3	0.49	0.10	217.03	4.41	135	7.02	48	196
Micropogonias undulatus	34	<0.1	9.3	0.46	0.18	394.81	11.76	19	1.08	12	37
Elops saurus	21	<0.1	2.8	0.29	0.21	781.25	22.06	47	4.43	27	123
Litopenaeus setiferus	21	<0.1	13.0	0.29	0.08	285.25	4.41	7	0.70	3	17
Albula vulpes	7	<0.1	2.8	0.10	0.07	768.49	7.35	47	3.98	32	60
Trachinotus falcatus	5	<0.1	1.9	0.07	0.06	855.08	5.88	24	5.58	11	42
Farfantepenaeus aztecus	4	<0.1	2.8	0.05	0.03	631.42	2.94	16	0.48	15	17
Cynoscion nebulosus	2	<0.1	1.9	0.03	0.02	731.40	1.47	33	8.00	25	41
Pomatomus saltatrix	2	<0.1	0.9	0.03	0.03	1,039.23	2.94	45	1.50	43	46
Paralichthys albigutta	2	<0.1	0.9	0.03	0.03	1,039.23	2.94	49	2.00	47	51
Farfantepenaeus duorarum	1	<0.1	0.9	0.01	0.01	1,039.23	1.47	17	.	17	17
Lutjanus analis	1	<0.1	0.9	0.01	0.01	1,039.23	1.47	82	.	82	82
Pogonias cromis	1	<0.1	0.9	0.01	0.01	1,039.23	1.47	12	.	12	12
Mugil rubrioculus	1	<0.1	0.9	0.01	0.01	1,039.23	1.47	226	.	226	226
Totals	**2,819**	**1.1**	**.**	**38.39**	**15.32**	**414.81**	**1,635.29**	**.**	**.**	**2**	**363**

Appendix IR13-01. Monthly summary of species collected during northern Indian River Lagoon stratified-random sampling, 2013. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	**Month**												**Totals**
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=64	**E=64**	**E=64**	**E=64**	**E=64**	**E=64**	**E=64**	**E=64**	**E=64**	**E=86**	**E=86**	**E=64**	**E=812**
Abudefduf saxatilis	.	.	.	.	.	.	2	.	.	.	.	.	2
Acanthostracion quadricornis	1	.	.	.	.	.	.	.	.	.	1	.	2
Achirus lineatus	12	10	7	6	2	12	4	12	3	9	5	10	92
Aetobatus narinari	.	.	.	1	.	.	1	.	.	.	.	.	2
Albula vulpes	1	3	1	4	14	.	.	5	.	4	1	.	33
Aluterus monoceros	.	.	.	.	.	.	.	.	.	.	1	.	1
Anchoa cubana	.	.	.	.	.	.	6	.	.	.	9	.	15
Anchoa hepsetus	2	.	84	155	913	255	6	57	78	.	71	.	1,621
Anchoa lamprotaenia	.	.	.	1	.	.	.	.	.	.	.	.	1
Anchoa lyolepis	2	.	.	1	102	.	.	319	802	4	764	3	1,997
Anchoa mitchilli	4,513	894	5,924	9,839	9,739	121,120	8,068	53,458	6,184	57,673	11,315	9,570	298,297
Anchoa spp.	.	.	.	2	.	.	28	.	.	.	.	.	30
Anisotremus virginicus	.	.	.	.	.	.	.	.	.	.	2	5	7
Archosargus probatocephalus	40	67	52	183	257	163	463	466	304	325	292	191	2,803
Archosargus rhomboidalis	6	.	4	.	.	21	.	1	2	2	20	2	58
Archosargus spp.	1	.	.	.	.	.	.	3	.	.	.	5	9
Argopecten gibbus	1	.	.	.	.	.	.	.	.	.	.	.	1
Argopecten spp.	1	.	.	.	1	.	.	.	.	.	.	.	2
Ariopsis felis	49	.	8	156	139	248	334	193	113	208	121	46	1,615
Bagre marinus	.	.	.	.	.	.	1	.	2	2	.	.	5
Bairdiella chrysoura	3	5	37	3	96	97	376	79	.	118	36	389	1,239
Bairdiella sanctaeluciae	.	.	.	.	.	.	.	.	.	.	.	1	1
Bathygobius soporator	1	1	.	1	1	.	.	.	.	.	.	.	4
Bothus robinsi	.	.	.	.	.	1	.	.	.	.	.	.	1

Appendix IR13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=86	E=86	E=64	E=812
Brevoortia spp.	284	26	1,461	1,952	1,975	122	128	289	24	45	38	73	6,417
Calamus arctifrons	1	.	.	1	.	.	.	.	.	.	.	.	2
Calamus penna	.	.	.	1	.	.	.	.	.	.	.	.	1
Callinectes ornatus	33	41	17	26	9	7	85	120	49	26	12	8	433
Callinectes sapidus	23	33	33	14	26	11	28	51	14	16	16	8	273
Callinectes similis	12	12	6	8	1	30	12	8	6	4	.	.	99
Callinectes spp.	33	.	3	.	.	.	.	.	.	.	.	.	36
Caranx bartholomaei	.	.	.	.	.	1	.	.	.	.	.	.	1
Caranx crysos	2	.	.	.	.	.	.	.	.	.	.	.	2
Caranx hippos	73	3	72	9	36	19	9	21	86	373	49	34	784
Caranx latus	1	.	.	.	2	.	.	4	2	5	3	1	18
Caranx sp.	.	.	.	.	.	1	.	.	.	.	.	.	1
Carcharhinus leucas	.	.	.	.	.	.	1	.	.	.	1	.	2
Centropomus undecimalis	85	29	17	20	9	17	52	193	175	29	39	18	683
Centropristis striata	5	.	.	.	.	.	.	.	.	.	.	.	5
Chaetodipterus faber	.	.	.	38	.	14	5	2	48	3	2	2	114
Charybdis hellerii	.	.	.	.	.	.	.	1	2	.	.	.	3
Chasmodes saburrae	2	4	1	4	9	7	12	7	.	3	17	.	66
Chilomycterus schoepfii	4	9	6	16	16	22	22	16	7	8	13	5	144
Chilomycterus sp.	.	.	.	.	.	.	.	.	.	1	.	.	1
Chloroscombrus chrysurus	22	.	.	27	.	.	1	1	1	1	5	.	58
Cichlasoma urophthalmus	.	2	.	.	.	.	.	.	.	.	.	.	2
Citharichthys macrops	.	.	.	.	.	.	.	.	.	.	.	1	1
Citharichthys spilopterus	6	11	22	5	3	1	14	5	.	.	.	1	68
Clupeidae spp.	.	.	.	1	.	.	1	.	.	.	.	.	2

Appendix IR13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=86	E=86	E=64	E=812
Coryphaena hippurus	.	.	.	.	.	.	.	.	.	.	1	.	1
Ctenogobius boleosoma	.	7	7	.	.	.	.	.	.	.	1	5	20
Ctenogobius pseudofasciatus	.	1	1	.	.	.	1	.	.	.	1	.	4
Ctenogobius shufeldti	.	.	.	.	.	.	.	.	1	.	.	.	1
Ctenogobius smaragdus	.	.	4	.	1	.	3	2	.	.	.	1	11
Cynoscion complex	1	.	.	.	.	.	1	.	.	1	.	.	3
Cynoscion nebulosus	9	4	4	2	32	12	45	40	20	92	52	9	321
Cyprinodon variegatus	3	4	34	7	.	.	.	1	11	4	.	.	64
Dasyatis sabina	34	29	35	70	105	122	86	38	81	92	87	34	813
Dasyatis say	8	4	4	4	14	9	10	3	9	11	38	6	120
Diapterus auratus	279	367	101	133	2,489	2,191	1,118	3,606	1,057	895	835	1,004	14,075
Diplodus holbrookii	.	.	.	.	.	1	1	.	.	.	.	.	2
Dormitator maculatus	1	.	10	.	.	13	2	2	.	1	1	13	43
Echeneis naucrates	1	.	.	.	.	.	.	.	.	1	.	.	2
Eleotris amblyopsis	6	.	.	.	.	.	.	.	.	.	.	.	6
Elops saurus	211	23	40	20	36	69	27	27	31	106	65	10	665
Elops smithi	1	.	.	.	.	.	.	.	.	.	1	.	2
Elops spp.	3	.	.	.	.	.	.	.	.	.	1	.	4
Erimyzon sucetta	.	.	.	.	.	11	.	.	.	.	.	.	11
Etropus crossotus	.	.	.	.	.	.	.	.	1	.	.	1	2
Eucinostomus argenteus	.	.	.	.	.	1	50	.	.	.	.	.	51
Eucinostomus gula	63	109	573	70	303	285	503	1,268	599	258	104	147	4,282
Eucinostomus harengulus	433	473	386	957	1,800	1,900	679	976	283	214	144	233	8,478
Eucinostomus jonesii	.	.	2	45	1	.	11	.	66	59	7	17	208
Eucinostomus melanopterus	.	.	.	.	.	.	.	3	.	1	2	6	12
Eucinostomus spp.	1,901	2,362	1,640	485	1,505	884	432	408	864	1,189	6,477	5,905	24,052

Appendix IR13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=86	E=86	E=64	E=812
Eugerres plumieri	1	7	238	130	211	93	119	28	20	4	23	5	879
Evorthodus lyricus	1	.	.	.	4	.	.	1	.	.	.	.	6
Farfantepenaeus aztecus	2	2	1	3	1	14	18	.	.	.	1	2	44
Farfantepenaeus duorarum	4	6	11	1	18	1	5	.	.	1	9	5	61
Farfantepenaeus spp.	96	216	186	206	80	5	15	91	104	25	100	112	1,236
Floridichthys carpio	9	7	52	59	1	80	146	345	131	1,042	618	131	2,621
Fundulus chrysotus	.	.	.	.	1	.	.	.	.	1	.	1	3
Fundulus grandis	2	1	3	1	4	.	2	.	1	.	.	2	16
Fundulus majalis	.	.	.	6	.	.	1	.	2	1	.	.	10
Fundulus seminolis	.	.	.	5	.	.	.	.	.	5	.	.	10
Gambusia holbrooki	141	244	31	326	89	95	11	17	8	9	43	203	1,217
Gerreidae spp.	.	.	.	4	.	.	.	.	.	.	.	.	4
Gerres cinereus	4	5	1	.	1	9	10	20	2	5	9	13	79
Gobiesox strumosus	1	.	1	2	.	.	.	.	.	.	.	.	4
Gobiomorus dormitor	.	1	.	.	.	.	.	.	2	.	.	1	4
Gobionellus oceanicus	8	.	.	.	.	.	.	.	.	.	.	1	9
Gobiosoma bosc	9	9	11	.	4	4	8	3	.	.	.	3	51
Gobiosoma robustum	35	165	259	161	118	93	495	189	63	28	206	42	1,854
Gobiosoma spp.	77	43	58	20	25	42	696	690	143	325	622	203	2,944
Gymnura micrura	9	4	4	8	11	8	5	7	9	14	9	8	96
Haemulon parra	.	1	.	.	.	1	.	1	94	1	2	.	100
Harengula jaguana	.	186	65	3,507	644	328	207	2,654	2,032	1,396	458	1,831	13,308
Heterandria formosa	.	2	2	26	45	5	1	.	.	.	.	14	95
Hippocampus erectus	1	2	4	1	3	11	1	6	3	22	13	.	67
Hippocampus zosterae	.	.	.	.	.	.	.	.	.	.	3	.	3
Hoplosternum littorale	.	.	.	.	.	1	.	.	.	.	.	.	1

Appendix IR13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=86	E=86	E=64	E=812
Hypoatherina harringtonensis	.	.	.	.	.	.	.	.	.	.	1	.	1
Hyporhamphus meeki	.	2	.	.	2	.	2	2	2	12	3	14	39
Hyporhamphus spp.	.	.	.	1	37	.	.	.	.	1	.	.	39
Ictaluridae sp.	.	.	.	.	.	.	1	.	.	.	.	.	1
Kyphosus sectatrix	.	.	.	.	.	.	.	.	.	.	1	.	1
Labidesthes sicculus	14	.	.	1	.	15	16	.	12	.	3	7	68
Lactophrys trigonus	.	1	.	.	.	1	1	.	.	.	2	1	6
Lactophrys triqueter	.	.	.	.	.	.	.	1	.	.	.	.	1
Lagodon rhomboides	38	207	111	537	417	853	553	696	845	920	289	374	5,840
Leiostomus xanthurus	95	143	20	133	213	369	17	268	7	22	110	.	1,397
Lepisosteus platyrhincus	.	1	.	.	1	.	2	1	.	.	2	.	7
Lepomis auritus	.	.	1	.	.	.	.	.	1	.	.	.	2
Lepomis gulosus	.	.	.	.	.	7	1	.	.	.	.	2	10
Lepomis macrochirus	1	.	.	.	.	.	20	.	2	24	.	46	93
Lepomis marginatus	.	.	.	.	.	.	.	.	.	.	.	1	1
Lepomis microlophus	6	.	.	5	3	1	3	3	1	3	1	48	74
Lepomis punctatus	2	.	.	.	.	1	.	.	.	.	.	5	8
Lepomis spp.	.	.	.	.	4	5	6	1	1	8	2	10	37
Limulus polyphemus	2	.	5	.	1	.	2	1	1	6	12	.	30
Litopenaeus setiferus	.	2	.	.	.	7	1	3	2	20	19	10	64
Lobotes surinamensis	1	.	.	.	.	1	.	.	.	.	6	.	8
Lophogobius cyprinoides	10	3	.	1	11	7	58	2	6	.	4	.	102
Lucania goodei	.	4	33	52	17	45	.	.	2	.	.	64	217
Lucania parva	18	2	17	338	171	61	404	113	17	1,069	239	14	2,463
Lupinoblennius nicholsi	.	.	.	.	.	1	.	.	.	.	1	.	2
Lutjanus analis	.	1	6	.	.	1	.	1	5	.	17	13	44

Appendix IR13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=86	E=86	E=64	E=812
Lutjanus griseus	1	5	1	1	8	34	27	16	30	26	8	1	158
Lutjanus jocu	.	.	.	.	.	.	.	1	.	.	.	.	1
Lutjanus synagris	2	.	.	.	.	2	2	.	5	.	2	.	13
Megalops atlanticus	.	.	.	.	.	.	.	.	.	1	.	1	2
Membras martinica	3	.	1	20	37	20	1	19	.	15	4	.	120
Menidia spp.	160	63	677	616	1,051	807	661	650	853	178	567	123	6,406
Menippe spp.	4	1	.	2	4	1	3	2	2	1	.	.	20
Menticirrhus americanus	16	2	6	3	28	18	38	7	13	27	82	8	248
Mercenaria mercenaria	.	.	.	1	.	.	.	.	.	.	.	.	1
Microgobius gulosus	64	11	35	65	50	316	204	309	138	399	504	117	2,212
Microgobius microlepis	.	.	.	.	.	.	2	.	2	5	5	3	17
Microgobius thalassinus	6	2	.	.	1	.	.	.	.	2	5	19	35
Microphis brachyurus	.	.	.	1	.	.	.	1	1	.	2	1	6
Micropogonias undulatus	55	13	3	23	2	.	.	2	.	1	50	73	222
Micropterus salmoides	2	.	.	.	46	8	.	1	1	.	.	.	58
Monacanthus ciliatus	.	.	.	.	.	.	2	.	2	.	1	.	5
Monacanthus sp.	.	.	.	.	.	.	.	.	1	.	.	.	1
Mugil cephalus	593	316	544	390	648	419	643	297	569	148	284	185	5,036
Mugil curema	2,943	557	433	520	405	348	213	110	142	318	1,719	649	8,357
Mugil rubrioculus	1	3	.	1	.	.	.	.	3	2	3	3	16
Mugil sp.	.	1	.	.	.	.	.	.	.	.	.	.	1
Nicholsina usta	.	1	.	.	.	.	.	.	1	.	.	.	2
Notropis maculatus	.	.	.	4	1	.	.	.	.	.	.	.	5
Oligoplites saurus	2	5	1	.	9	21	80	32	17	41	47	21	276
Opisthonema oglinum	.	.	.	844	227	934	44	93	54	210	17	2	2,425
Opsanus tau	1	.	1	1	5	2	2	1	.	4	3	1	21

Appendix IR13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=86	E=86	E=64	E=812
Oreochromis/Sarotherodon spp.	.	.	.	.	7	1	.	.	.	.	.	.	8
Orthopristis chrysoptera	1	50	64	24	123	97	21	61	38	53	333	50	915
Panulirus argus	1	.	.	.	.	1	.	.	.	.	.	.	2
Paralichthys albigutta	.	11	6	4	6	4	.	4	2	3	5	4	49
Paralichthys lethostigma	.	.	1	.	.	.	.	1	.	.	.	.	2
Poecilia latipinna	.	71	20	155	22	10	.	8	1	2	6	1	296
Pogonias cromis	12	1	.	40	50	33	41	172	232	43	86	34	744
Pomatomus saltatrix	3	.	.	.	.	25	1	2	1	.	3	.	35
Portunus spp.	2	5	.	1	1	1	.	.	2	.	.	.	12
Prionotus scitulus	5	.	.	8	6	7	4	5	9	2	6	2	54
Prionotus tribulus	.	2	1	.	.	1	1	.	1	2	3	4	15
Pterygoplichthys spp.	.	.	.	.	.	.	.	1	1	.	.	.	2
Sardinella aurita	.	.	.	.	.	.	.	.	2	.	.	.	2
Sciaenidae sp.	.	.	1	.	.	.	.	.	.	.	.	.	1
Sciaenops ocellatus	41	25	26	50	79	27	68	43	76	94	322	194	1,045
Scomberomorus maculatus	.	.	.	.	1	.	.	.	.	1	.	1	3
Scomberomorus regalis	1	.	.	.	.	1	.	4	.	.	.	.	6
Scorpaena grandicornis	.	.	.	.	.	1	.	.	.	.	.	.	1
Scorpaena plumieri	.	.	.	.	.	.	.	.	.	.	3	.	3
Selene vomer	7	.	.	.	1	4	.	18	5	17	21	15	88
Seriola rivoliana	.	1	.	.	.	.	.	.	.	.	.	.	1
Sicyonia laevigata	1	1	.	.	.	.	.	.	.	.	.	.	2
Sphoeroides nephelus	70	64	51	44	61	63	36	98	48	59	96	58	748

Appendix IR13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=64	E=86	E=86	E=64	E=812
Sphoeroides spengleri	3	.	6	4	6	1	4	.	9	1	23	.	57
Sphoeroides testudineus	6	.	1	.	.	3	4	.	.	4	10	8	36
Sphyraena barracuda	1	1	4	1	2	6	7	16	15	9	9	12	83
Sphyraena borealis	.	.	.	.	.	.	3	.	.	.	.	.	3
Sphyrna tiburo	.	.	.	1	1	1	.	.	.	.	.	.	3
Stephanolepis hispidus	1	.	.	.	.	1	.	.	6	.	5	2	15
Strongylura marina	5	3	2	11	1	3	.	2	4	2	.	10	43
Strongylura notata	8	6	10	6	10	79	86	152	102	44	18	46	567
Strongylura spp.	3	.	.	.	.	.	2	.	.	.	1	.	6
Strongylura timucu	.	.	.	.	.	.	.	1	.	.	.	1	2
Symphurus plagiusa	5	.	1	.	.	.	.	.	.	.	.	.	6
Syngnathus louisianae	4	1	2	2	1	5	6	4	.	5	7	7	44
Syngnathus scovelli	14	37	51	40	71	21	140	71	20	27	80	41	613
Synodus foetens	5	3	5	2	7	2	3	3	3	5	2	3	43
Trachinotus carolinus	.	.	2	.	.	1	.	2	.	.	.	.	5
Trachinotus falcatus	1	.	2	14	2	24	25	6	56	23	19	.	172
Trinectes maculatus	1	6	3	1	.	3	3	11	.	.	.	1	29
Tylosurus crocodilus	.	.	.	.	.	.	.	2	2	.	.	.	4
Totals	**12,814**	**7,068**	**13,677**	**22,701**	**24,753**	**133,188**	**17,832**	**69,057**	**16,912**	**68,521**	**27,839**	**22,651**	**437,013**

Appendix IR13-02. Summary by gear and stratum of species collected during northern Indian River Lagoon stratified-random sampling, 2013. Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or offshore) within 5-m. Offshore sets were further stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 21.3-m river seine and 183-m haul seine was stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Sampling with 6.1-m otter trawl was not stratified. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	**Gear and Strata**								**Totals**
	21.3-m bay seine			**21.3-m river seine**		**183-m haul seine**		**6.1-m otter trawl**	
	Veg	**Unveg**	**Shore**	**Over**	**Nonover**	**Over**	**Nonover**		
	E=76	**E=88**	**E=216**	**E=77**	**E=31**	**E=164**	**E=64**	**E=96**	**E=812**
Abudefduf saxatilis	.	.	2	.	.	.	.	.	2
Acanthostracion quadricornis	.	.	.	.	.	1	.	1	2
Achirus lineatus	17	5	27	14	1	8	6	14	92
Aetobatus narinari	.	.	.	.	.	1	1	.	2
Albula vulpes	2	.	18	6	1	5	1	.	33
Aluterus monoceros	.	.	.	.	.	1	.	.	1
Anchoa cubana	1	.	7	1	.	.	.	6	15
Anchoa hepsetus	40	346	927	205	20	.	.	83	1,621
Anchoa lamprotaenia	.	.	.	.	1	.	.	.	1
Anchoa lyolepis	1	424	525	320	727	.	.	.	1,997
Anchoa mitchilli	1,417	9,075	77,682	180,654	29,155	.	.	314	298,297
Anchoa spp.	.	.	.	.	2	.	.	28	30
Anisotremus virginicus	.	.	.	.	.	7	.	.	7
Archosargus probatocephalus	19	17	228	82	29	1,798	528	102	2,803
Archosargus rhomboidalis	.	.	2	.	.	29	27	.	58
Archosargus spp.	.	.	.	.	.	9	.	.	9
Argopecten gibbus	.	.	.	.	.	.	.	1	1
Argopecten spp.	.	.	.	.	.	.	.	2	2
Ariopsis felis	22	12	93	.	.	959	471	58	1,615
Bagre marinus	.	.	.	.	.	5	.	.	5
Bairdiella chrysoura	49	379	209	1	.	424	138	39	1,239
Bairdiella sanctaeluciae	.	.	.	.	.	1	.	.	1
Bathygobius soporator	.	.	1	1	2	.	.	.	4
Bothus robinsi	.	.	.	.	.	.	.	1	1
Brevoortia spp.	17	215	2,703	1,140	1,772	145	425	.	6,417
Calamus arctifrons	.	1	.	.	.	.	.	1	2
Calamus sp.	1	.	.	.	.	.	.	.	1
Callinectes ornatus	4	.	49	5	7	7	8	353	433

Appendix IR13-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=76	E=88	E=216	E=77	E=31	E=164	E=64	E=96	E=812
Callinectes sapidus	3	2	27	42	12	30	17	140	273
Callinectes similis	.	.	10	1	.	8	.	80	99
Callinectes spp.	.	.	3	.	.	.	.	33	36
Caranx bartholomaei	.	.	.	.	.	.	1	.	1
Caranx crysos	.	.	.	.	.	2	.	.	2
Caranx hippos	.	.	.	6	1	637	140	.	784
Caranx latus	.	.	.	9	2	6	1	.	18
Caranx sp.	.	.	1	.	.	.	.	.	1
Carcharhinus leucas	.	.	.	.	.	2	.	.	2
Centropomus undecimalis	.	.	3	440	128	90	22	.	683
Centropristis striata	.	.	.	.	.	.	.	5	5
Chaetodipterus faber	.	1	2	.	.	60	50	1	114
Charybdis hellerii	.	.	.	.	.	.	.	3	3
Chasmodes saburrae	9	5	16	1	1	4	3	27	66
Chilomycterus schoepfii	4	2	1	.	.	74	32	31	144
Chilomycterus sp.	.	.	1	.	.	.	.	.	1
Chloroscombrus chrysurus	1	.	2	.	.	53	.	2	58
Cichlasoma urophthalmus	.	.	.	1	1	.	.	.	2
Citharichthys macrops	.	.	.	.	.	.	.	1	1
Citharichthys spilopterus	1	2	21	2	8	7	4	23	68
Clupeidae spp.	.	1	.	.	.	.	.	1	2
Coryphaena hippurus	.	1	.	.	.	.	.	.	1
Ctenogobius boleosoma	5	.	6	2	.	.	.	7	20
Ctenogobius pseudofasciatus	.	.	.	3	1	.	.	.	4
Ctenogobius shufeldti	.	.	.	1	.	.	.	.	1
Ctenogobius smaragdus	.	.	10	.	.	.	.	1	11
Cynoscion complex	.	1	.	.	.	1	.	1	3
Cynoscion nebulosus	86	18	110	2	.	76	12	17	321
Cyprinodon variegatus	.	.	64	.	.	.	.	.	64
Dasyatis sabina	3	5	13	.	.	558	227	7	813
Dasyatis say	2	1	2	.	.	77	36	2	120
Diapterus auratus	224	25	1,320	4,575	1,385	1,745	4,688	113	14,075
Diplodus holbrookii	.	.	.	.	.	2	.	.	2

Appendix IR13-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=76	E=88	E=216	E=77	E=31	E=164	E=64	E=96	E=812
Dormitator maculatus	.	.	.	15	28	.	.	.	43
Echeneis naucrates	.	.	.	.	.	2	.	.	2
Eleotris amblyopsis	.	.	.	6	.	.	.	.	6
Elops saurus	.	2	5	20	1	429	191	17	665
Elops smithi	.	.	.	1	.	.	.	1	2
Elops spp.	.	2	2	.	.	.	.	.	4
Erimyzon sucetta	.	.	.	.	11	.	.	.	11
Etropus crossotus	.	.	.	.	.	.	.	2	2
Eucinostomus argenteus	.	.	51	.	.	.	.	.	51
Eucinostomus gula	222	8	1,610	205	40	1,729	370	98	4,282
Eucinostomus harengulus	70	19	1,164	1,082	329	4,030	1,761	23	8,478
Eucinostomus jonesii	15	4	185	.	.	.	.	4	208
Eucinostomus melanopterus	.	2	1	.	.	6	3	.	12
Eucinostomus spp.	1,203	173	6,398	14,343	1,208	.	.	727	24,052
Eugerres plumieri	.	.	.	758	115	4	2	.	879
Evorthodus lyricus	.	.	.	2	4	.	.	.	6
Farfantepenaeus aztecus	1	1	6	3	1	25	2	5	44
Farfantepenaeus duorarum	.	1	22	1	.	4	5	28	61
Farfantepenaeus spp.	99	13	453	273	28	5	2	363	1,236
Floridichthys carpio	41	1	2,568	.	.	7	4	.	2,621
Fundulus chrysotus	.	.	.	1	2	.	.	.	3
Fundulus grandis	.	.	6	5	.	3	2	.	16
Fundulus majalis	.	.	6	.	.	2	2	.	10
Fundulus seminolis	.	.	.	.	10	.	.	.	10
Gambusia holbrooki	.	.	.	644	573	.	.	.	1,217
Gerreidae spp.	.	.	.	4	.	.	.	.	4
Gerres cinereus	.	.	4	10	10	33	22	.	79
Gobiesox strumosus	1	.	3	.	.	.	.	.	4
Gobiomorus dormitor	.	.	.	3	1	.	.	.	4
Gobionellus oceanicus	.	.	9	.	.	.	.	.	9
Gobiosoma bosc	.	.	11	28	8	.	.	4	51
Gobiosoma robustum	426	86	317	.	2	.	.	1,023	1,854
Gobiosoma spp.	971	97	559	31	14	.	.	1,272	2,944

Appendix IR13-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=76	E=88	E=216	E=77	E=31	E=164	E=64	E=96	E=812
Gymnura micrura	4	1	5	.	.	58	24	4	96
Haemulon parra	21	.	74	1	.	4	.	.	100
Harengula jaguana	2,513	1	6,110	315	4	4,077	288	.	13,308
Heterandria formosa	.	.	.	61	34	.	.	.	95
Hippocampus erectus	4	11	28	.	.	5	2	17	67
Hippocampus zosterae	1	.	2	.	.	.	.	.	3
Hoplosternum littorale	.	.	.	.	1	.	.	.	1
Hypoatherina harringtonensis	.	.	.	1	.	.	.	.	1
Hyporhamphus meeki	16	19	.	.	.	2	2	.	39
Hyporhamphus spp.	1	37	1	.	.	.	.	.	39
Ictaluridae sp.	.	.	.	1	.	.	.	.	1
Kyphosus sectatrix	.	.	.	.	.	1	.	.	1
Labidesthes sicculus	.	.	.	51	17	.	.	.	68
Lactophrys trigonus	.	.	1	.	.	3	.	2	6
Lactophrys triqueter	.	.	.	.	.	.	1	.	1
Lagodon rhomboides	251	10	483	53	472	3,287	1,014	270	5,840
Leiostomus xanthurus	2	1	248	8	183	844	111	.	1,397
Lepisosteus platyrhincus	.	.	.	4	3	.	.	.	7
Lepomis auritus	.	.	.	2	.	.	.	.	2
Lepomis gulosus	.	.	.	1	9	.	.	.	10
Lepomis macrochirus	.	.	.	25	68	.	.	.	93
Lepomis marginatus	.	.	.	.	1	.	.	.	1
Lepomis microlophus	.	.	.	15	59	.	.	.	74
Lepomis punctatus	.	.	.	2	6	.	.	.	8
Lepomis spp.	.	.	.	10	27	.	.	.	37
Limulus polyphemus	.	.	11	.	.	14	5	.	30
Litopenaeus setiferus	5	1	31	17	4	.	.	6	64
Lobotes surinamensis	.	.	.	6	.	2	.	.	8
Lophogobius cyprinoides	.	.	.	91	11	.	.	.	102
Lucania goodei	.	.	.	81	136	.	.	.	217
Lucania parva	778	1	1,107	354	223	.	.	.	2,463
Lupinoblennius nicholsi	.	.	.	.	1	.	.	1	2

Appendix IR13-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=76	E=88	E=216	E=77	E=31	E=164	E=64	E=96	E=812
Lutjanus analis	.	.	1	1	.	36	.	6	44
Lutjanus griseus	7	1	18	22	14	41	27	28	158
Lutjanus jocu	.	.	.	.	.	.	.	1	1
Lutjanus synagris	.	.	.	.	.	2	2	9	13
Megalops atlanticus	.	.	.	.	.	2	.	.	2
Membras martinica	17	38	64	1	.	.	.	.	120
Menidia spp.	298	83	3,899	1,177	949	.	.	.	6,406
Menippe spp.	.	.	2	.	.	4	1	13	20
Menticirrhus americanus	7	7	55	.	.	129	42	8	248
Mercenaria mercenaria	1	.	.	.	.	.	.	.	1
Microgobius gulosus	664	118	1,323	46	38	.	.	23	2,212
Microgobius microlepis	.	.	4	.	.	.	.	13	17
Microgobius thalassinus	1	1	31	.	1	.	.	1	35
Microphis brachyurus	.	.	.	4	2	.	.	.	6
Micropogonias undulatus	1	2	146	18	16	3	1	35	222
Micropterus salmoides	.	.	.	49	9	.	.	.	58
Monacanthus ciliatus	.	.	.	.	.	.	.	5	5
Monacanthus sp.	.	.	.	.	.	.	.	1	1
Mugil cephalus	6	5	486	41	82	2,681	1,735	.	5,036
Mugil curema	10	14	347	1,159	52	5,618	1,157	.	8,357
Mugil rubrioculus	.	1	4	.	1	7	3	.	16
Mugil sp.	.	.	1	.	.	.	.	.	1
Nicholsina usta	1	.	.	.	.	.	1	.	2
Notropis maculatus	.	.	.	1	4	.	.	.	5
Oligoplites saurus	7	10	127	9	.	97	26	.	276
Opisthonema oglinum	97	63	1,082	928	11	237	7	.	2,425
Opsanus tau	.	.	2	.	.	6	5	8	21
Oreochromis/Sarotherodon spp.	.	.	.	7	1	.	.	.	8
Orthopristis chrysoptera	58	10	88	1	.	431	85	242	915
Panulirus argus	.	.	.	.	.	1	.	1	2
Paralichthys albigutta	12	3	5	.	2	6	3	18	49
Paralichthys lethostigma	.	.	1	.	.	.	1	.	2

Appendix IR13-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=76	E=88	E=216	E=77	E=31	E=164	E=64	E=96	E=812
Poecilia latipinna	1	.	20	129	146	.	.	.	296
Pogonias cromis	.	2	9	.	1	653	79	.	744
Pomatomus saltatrix	.	1	.	.	2	28	4	.	35
Portunus spp.	.	.	.	.	.	.	1	11	12
Prionotus scitulus	5	2	.	.	.	33	9	5	54
Prionotus tribulus	.	1	3	.	1	3	1	6	15
Pterygoplichthys spp.	.	.	.	2	.	.	.	.	2
Sardinella aurita	.	.	1	.	.	1	.	.	2
Sciaenidae sp.	.	.	1	.	.	.	.	.	1
Sciaenops ocellatus	8	14	423	120	2	383	75	20	1,045
Scomberomorus maculatus	.	.	1	.	.	2	.	.	3
Scomberomorus regalis	4	.	.	.	.	1	1	.	6
Scorpaena grandicornis	.	.	.	.	.	1	.	.	1
Scorpaena plumieri	.	.	.	.	.	3	.	.	3
Selene vomer	.	1	3	1	.	56	20	7	88
Seriola rivoliana	.	.	1	.	.	.	.	.	1
Sicyonia laevigata	.	.	.	.	.	.	.	2	2
Sphoeroides nephelus	14	17	34	4	1	346	293	39	748
Sphoeroides spengleri	3	1	5	.	.	29	4	15	57
Sphoeroides testudineus	.	2	16	7	2	5	1	3	36
Sphyraena barracuda	1	2	9	6	9	44	11	1	83
Sphyraena borealis	3	.	.	.	.	.	.	.	3
Sphyrna tiburo	.	1	.	.	.	.	2	.	3
Stephanolepis hispidus	1	2	1	.	.	.	.	11	15
Strongylura marina	1	.	3	.	1	27	11	.	43
Strongylura notata	18	45	435	5	14	41	9	.	567
Strongylura spp.	.	.	4	.	2	.	.	.	6
Strongylura timucu	.	.	1	.	1	.	.	.	2
Symphurus plagiusa	.	.	1	.	.	2	.	3	6
Syngnathus louisianae	17	7	12	.	.	2	1	5	44
Syngnathus scovelli	141	38	86	3	3	.	.	342	613
Synodus foetens	4	6	2	.	1	17	2	11	43

Appendix IR13-02. (Continued)

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=76	E=88	E=216	E=77	E=31	E=164	E=64	E=96	E=812
Trachinotus carolinus	.	.	.	.	.	.	5	.	5
Trachinotus falcatus	.	.	54	1	4	92	21	.	172
Trinectes maculatus	.	.	.	21	7	.	1	.	29
Tylosurus crocodilus	2	.	.	.	.	2	.	.	4
Totals	**9,983**	**11,527**	**114,377**	**209,811**	**38,279**	**32,480**	**14,298**	**6,258**	**437,013**

Appendix IR13-03. Summary by zone of species collected during northern Indian River Lagoon stratified-random sampling, 2013. Zones A-C and H were located in the Indian River; Zones D-E encompassed the Banana River; and Zones F encompassed the lower Sebastian River and Turkey Creek. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	**Zone**							
	A	**B**	**C**	**D**	**E**	**H**	**F**	**Totals**
	E=16	**E=14**	**E=168**	**E=168**	**E=62**	**E=276**	**E=108**	**E=812**
Abudefduf saxatilis	.	.	.	.	.	2	.	2
Acanthostracion quadricornis	.	.	.	.	.	2	.	2
Achirus lineatus	2	2	13	23	6	31	15	92
Aetobatus narinari	.	.	.	.	.	2	.	2
Albula vulpes	.	.	7	.	5	14	7	33
Aluterus monoceros	.	.	.	.	.	1	.	1
Anchoa cubana	.	.	.	.	.	14	1	15
Anchoa hepsetus	.	.	282	.	.	1,114	225	1,621
Anchoa lamprotaenia	.	.	.	.	.	.	1	1
Anchoa lyolepis	1	.	1	.	.	948	1,047	1,997
Anchoa mitchilli	760	690	64,698	3,823	5,005	13,512	209,809	298,297
Anchoa spp.	.	.	.	.	.	28	2	30
Anisotremus virginicus	.	.	.	.	.	7	.	7
Archosargus probatocephalus	11	6	428	1,536	246	465	111	2,803
Archosargus rhomboidalis	.	.	.	1	.	57	.	58
Archosargus spp.	.	.	1	3	.	5	.	9
Argopecten gibbus	.	.	.	.	.	1	.	1
Argopecten spp.	.	.	.	.	.	2	.	2
Ariopsis felis	17	10	546	391	313	338	.	1,615
Bagre marinus	.	.	3	.	.	2	.	5
Bairdiella chrysoura	15	31	664	21	11	496	1	1,239
Bairdiella sanctaeluciae	.	.	.	.	.	1	.	1
Bathygobius soporator	.	.	.	.	.	1	3	4
Bothus robinsi	.	.	.	.	.	1	.	1
Brevoortia spp.	2	.	3,373	7	63	60	2,912	6,417
Calamus arctifrons	.	.	.	.	.	2	.	2
Calamus sp.	.	.	.	.	.	1	.	1
Callinectes ornatus	.	.	.	.	.	421	12	433
Callinectes sapidus	1	.	24	.	.	194	54	273
Callinectes similis	.	.	.	.	.	98	1	99
Callinectes spp.	.	.	.	.	.	36	.	36

Appendix IR13-03 (Continued)

Species	**Zone**							
	A	**B**	**C**	**D**	**E**	**H**	**F**	**Totals**
	E=16	**E=14**	**E=168**	**E=168**	**E=62**	**E=276**	**E=108**	**E=812**
Caranx bartholomaei	.	.	.	.	.	1	.	1
Caranx crysos	.	.	.	.	.	2	.	2
Caranx hippos	.	.	64	408	7	298	7	784
Caranx latus	.	.	1	.	1	5	11	18
Caranx sp.	.	.	.	.	.	1	.	1
Carcharhinus leucas	.	.	1	1	.	.	.	2
Centropomus undecimalis	.	.	18	20	2	75	568	683
Centropristis striata	.	.	.	.	.	5	.	5
Chaetodipterus faber	.	.	58	15	1	40	.	114
Charybdis hellerii	.	.	.	.	.	3	.	3
Chasmodes saburrae	.	.	15	9	4	36	2	66
Chilomycterus schoepfii	2	1	43	19	26	53	.	144
Chilomycterus sp.	.	.	.	1	.	.	.	1
Chloroscombrus chrysurus	1	.	27	1	3	26	.	58
Cichlasoma urophthalmus	.	.	.	.	.	.	2	2
Citharichthys macrops	.	.	.	.	.	1	.	1
Citharichthys spilopterus	.	.	7	.	.	51	10	68
Clupeidae spp.	.	.	1	.	.	1	.	2
Coryphaena hippurus	.	.	.	.	.	1	.	1
Ctenogobius boleosoma	.	.	.	.	.	18	2	20
Ctenogobius pseudofasciatus	.	.	.	.	.	.	4	4
Ctenogobius shufeldti	.	.	.	.	.	.	1	1
Ctenogobius smaragdus	.	.	.	.	.	11	.	11
Cynoscion complex	.	.	1	.	.	2	.	3
Cynoscion nebulosus	47	29	67	91	16	69	2	321
Cyprinodon variegatus	.	4	.	60	.	.	.	64
Dasyatis sabina	1	1	186	233	306	86	.	813
Dasyatis say	.	1	34	27	17	41	.	120
Diapterus auratus	5	7	5,548	319	273	1,963	5,960	14,075
Diplodus holbrookii	.	.	.	.	.	2	.	2
Dormitator maculatus	.	.	.	.	.	.	43	43
Echeneis naucrates	.	.	.	2	.	.	.	2
Eleotris amblyopsis	.	.	.	.	.	.	6	6

Appendix IR13-03 (Continued)

Species	Zone							
	A	B	C	D	E	H	F	Totals
	E=16	E=14	E=168	E=168	E=62	E=276	E=108	E=812
Elops saurus	.	.	319	114	79	132	21	665
Elops smithi	.	.	.	.	.	1	1	2
Elops spp.	.	.	.	.	.	4	.	4
Erimyzon sucetta	.	.	.	.	.	.	11	11
Etropus crossotus	.	.	.	.	.	2	.	2
Eucinostomus argenteus	.	.	.	.	.	51	.	51
Eucinostomus gula	2	.	77	86	59	3,813	245	4,282
Eucinostomus harengulus	17	2	2,136	1,459	867	2,586	1,411	8,478
Eucinostomus jonesii	.	.	.	.	.	208	.	208
Eucinostomus melanopterus	.	.	.	.	.	12	.	12
Eucinostomus spp.	90	38	1,532	145	6	6,690	15,551	24,052
Eugerres plumieri	.	.	2	.	.	4	873	879
Evorthodus lyricus	.	.	.	.	.	.	6	6
Farfantepenaeus aztecus	1	.	29	.	.	10	4	44
Farfantepenaeus duorarum	1	.	19	.	.	40	1	61
Farfantepenaeus spp.	4	.	79	.	.	852	301	1,236
Floridichthys carpio	64	1,063	6	1,469	14	5	.	2,621
Fundulus chrysotus	.	.	.	.	.	.	3	3
Fundulus grandis	.	.	.	7	1	3	5	16
Fundulus majalis	.	.	.	9	1	.	.	10
Fundulus seminolis	.	.	.	.	.	.	10	10
Gambusia holbrooki	.	.	.	.	.	.	1,217	1,217
Gerreidae spp.	.	.	.	.	.	.	4	4
Gerres cinereus	.	.	11	9	3	36	20	79
Gobiesox strumosus	.	.	.	3	.	1	.	4
Gobiomorus dormitor	.	.	.	.	.	.	4	4
Gobionellus oceanicus	.	.	.	.	.	9	.	9
Gobiosoma bosc	.	.	.	.	.	15	36	51
Gobiosoma robustum	2	6	137	492	6	1,209	2	1,854
Gobiosoma spp.	.	32	201	1,043	51	1,572	45	2,944
Gymnura micrura	.	.	60	1	1	34	.	96
Haemulon parra	.	.	.	.	.	99	1	100
Harengula jaguana	.	.	1,686	153	1,547	9,603	319	13,308

Appendix IR13-03 (Continued)

Species	**Zone**							
	A	**B**	**C**	**D**	**E**	**H**	**F**	**Totals**
	E=16	**E=14**	**E=168**	**E=168**	**E=62**	**E=276**	**E=108**	**E=812**
Heterandria formosa	.	.	.	.	.	.	95	95
Hippocampus erectus	.	2	7	25	11	22	.	67
Hippocampus zosterae	3	.	.	.	.	.	.	3
Hoplosternum littorale	.	.	.	.	.	.	1	1
Hypoatherina harringtonensis	.	.	.	.	.	.	1	1
Hyporhamphus meeki	.	1	15	14	2	7	.	39
Hyporhamphus spp.	1	.	2	.	.	36	.	39
Ictaluridae sp.	.	.	.	.	.	.	1	1
Kyphosus sectatrix	.	.	.	.	.	1	.	1
Labidesthes sicculus	.	.	.	.	.	.	68	68
Lactophrys trigonus	.	.	.	.	.	6	.	6
Lactophrys triqueter	.	.	.	.	.	1	.	1
Lagodon rhomboides	36	1	661	1,160	292	3,165	525	5,840
Leiostomus xanthurus	.	.	184	355	54	613	191	1,397
Lepisosteus platyrhincus	.	.	.	.	.	.	7	7
Lepomis auritus	.	.	.	.	.	.	2	2
Lepomis gulosus	.	.	.	.	.	.	10	10
Lepomis macrochirus	.	.	.	.	.	.	93	93
Lepomis marginatus	.	.	.	.	.	.	1	1
Lepomis microlophus	.	.	.	.	.	.	74	74
Lepomis punctatus	.	.	.	.	.	.	8	8
Lepomis spp.	.	.	.	.	.	.	37	37
Limulus polyphemus	.	.	4	12	12	2	.	30
Litopenaeus setiferus	8	13	9	.	.	13	21	64
Lobotes surinamensis	.	.	2	.	.	.	6	8
Lophogobius cyprinoides	.	.	.	.	.	.	102	102
Lucania goodei	.	.	.	.	.	.	217	217
Lucania parva	1,120	135	20	524	6	81	577	2,463
Lupinoblennius nicholsi	.	.	.	.	.	1	1	2
Lutjanus analis	.	.	.	.	.	43	1	44
Lutjanus griseus	.	.	13	4	1	104	36	158
Lutjanus jocu	.	.	.	.	.	1	.	1
Lutjanus synagris	.	.	.	.	.	13	.	13

Appendix IR13-03 (Continued)

Species	**Zone**							
	A	**B**	**C**	**D**	**E**	**H**	**F**	**Totals**
	E=16	**E=14**	**E=168**	**E=168**	**E=62**	**E=276**	**E=108**	**E=812**
Megalops atlanticus	.	.	.	2	.	.	.	2
Membras martinica	14	.	83	6	3	13	1	120
Menidia spp.	80	78	814	2,516	193	599	2,126	6,406
Menippe spp.	.	.	5	.	.	15	.	20
Menticirrhus americanus	1	10	114	15	89	19	.	248
Mercenaria mercenaria	.	.	.	.	.	1	.	1
Microgobius gulosus	184	183	505	899	111	246	84	2,212
Microgobius microlepis	.	.	.	.	.	17	.	17
Microgobius thalassinus	5	1	.	.	.	28	1	35
Microphis brachyurus	.	.	.	.	.	.	6	6
Micropogonias undulatus	.	.	2	2	.	184	34	222
Micropterus salmoides	.	.	.	.	.	.	58	58
Monacanthus ciliatus	.	.	.	.	.	5	.	5
Monacanthus sp.	.	.	.	.	.	1	.	1
Mugil cephalus	2	3	1,409	1,486	926	1,087	123	5,036
Mugil curema	7	14	1,505	819	3,320	1,481	1,211	8,357
Mugil rubrioculus	.	1	5	1	4	4	1	16
Mugil sp.	.	.	.	.	.	1	.	1
Nicholsina usta	.	.	.	.	.	2	.	2
Notropis maculatus	.	.	.	.	.	.	5	5
Oligoplites saurus	.	2	131	87	16	31	9	276
Opisthonema oglinum	.	.	497	4	4	981	939	2,425
Opsanus tau	.	.	7	1	5	8	.	21
Oreochromis/Sarotherodon spp.	.	.	.	.	.	.	8	8
Orthopristis chrysoptera	1	.	113	12	5	783	1	915
Panulirus argus	.	.	.	.	.	2	.	2
Paralichthys albigutta	.	.	.	1	.	46	2	49
Paralichthys lethostigma	.	.	.	.	.	2	.	2
Poecilia latipinna	1	.	1	15	4	.	275	296
Pogonias cromis	1	1	50	673	2	16	1	744
Pomatomus saltatrix	.	.	15	1	.	17	2	35
Portunus spp.	.	.	.	.	.	12	.	12
Prionotus scitulus	.	.	15	24	9	6	.	54

Appendix IR13-03 (Continued)

Species	Zone							
	A	B	C	D	E	H	F	Totals
	E=16	E=14	E=168	E=168	E=62	E=276	E=108	E=812
Prionotus tribulus	.	.	.	.	.	14	1	15
Pterygoplichthys spp.	.	.	.	.	.	.	2	2
Sardinella aurita	.	.	.	.	.	2	.	2
Sciaenidae sp.	.	.	1	.	.	.	.	1
Sciaenops ocellatus	.	10	99	299	97	418	122	1,045
Scomberomorus maculatus	.	.	1	.	.	2	.	3
Scomberomorus regalis	.	.	.	.	.	6	.	6
Scorpaena grandicornis	.	.	.	.	.	1	.	1
Scorpaena plumieri	.	.	.	.	.	3	.	3
Selene vomer	.	.	17	1	.	69	1	88
Seriola rivoliana	.	.	1	.	.	.	.	1
Sicyonia laevigata	.	.	.	.	.	2	.	2
Sphoeroides nephelus	1	6	257	260	90	129	5	748
Sphoeroides spengleri	.	.	.	.	.	57	.	57
Sphoeroides testudineus	.	.	.	.	.	27	9	36
Sphyraena barracuda	.	.	4	2	.	62	15	83
Sphyraena borealis	.	.	.	.	.	3	.	3
Sphyrna tiburo	.	.	1	.	.	2	.	3
Stephanolepis hispidus	.	.	.	.	.	15	.	15
Strongylura marina	.	.	7	8	16	11	1	43
Strongylura notata	4	3	139	340	10	52	19	567
Strongylura spp.	.	1	1	1	.	1	2	6
Strongylura timucu	.	.	.	.	.	1	1	2
Symphurus plagiusa	.	.	.	.	.	6	.	6
Syngnathus louisianae	7	3	7	10	1	16	.	44
Syngnathus scovelli	22	12	48	117	3	405	6	613
Synodus foetens	.	.	1	.	.	41	1	43
Trachinotus carolinus	.	.	1	2	.	2	.	5
Trachinotus falcatus	.	.	24	72	.	71	5	172
Trinectes maculatus	.	.	1	.	.	.	28	29
Tylosurus crocodilus	.	.	.	.	.	4	.	4
Totals	**2,544**	**2,403**	**89,203**	**21,771**	**14,226**	**58,776**	**248,090**	**437,013**

Cedar Key

Cedar Key is in the Suwannee River estuary, an open system located along the Gulf Coast of Florida within the area known as the Big Bend. Freshwater inflow into the estuary comes primarily from the Suwannee River with additional input from many fringing marsh tidal creeks (Lindberg et al. 1992). The shoreline consists largely of marsh grasses, oyster bars, and mud flats. Seagrass meadows primarily occur in the southern portions of the estuary (Tuckey and Dehaven 2006).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling in the Cedar Key area since 1996. The area sampled was divided into two geographically-defined bay zones (B and C) and one riverine zone (F; Figure CK13-01). Monthly stratified-random sampling (SRS) was conducted in Zones B and C using 21.3-m bay seines, 183-m haul seines, and 6.1-m bay otter trawls. Tidal creeks in Zone B were sampled using 21.3-m river seines. Monthly SRS was conducted in Zone F with 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2013 in the Cedar Key area.

Stratified-Random Sampling

A total of 135,601 animals, which included 153 taxa of fishes and seven taxa of selected invertebrates, were collected from 792 Cedar Key SRS samples in 2013 (Table CK13-01; Appendices CK13-01 and -02). *Anchoa hepsetus* (n=51,254) was the most numerous species collected, representing 37.8% of the total catch. *Anchoa mitchilli* (n=41,846) and *Bairdiella chrysoura* (n=5,721) were the next most abundant taxa collected, accounting for an additional 35.1% of the total catch. Twenty-nine Selected Taxa (n=10,616 animals) composed 7.8% of the total catch. *Leiostomus xanthurus* (n=3,604) was the most abundant Selected Taxon, representing 2.7% of the annual catch. Collections in 2013 included five species new to the Cedar Key FIM collection: *Negaprion brevirostris* (Lemon Shark), *Ocyurus chrysurus* (Yellowtail Snapper), *Percina nigrofasciata* (Blackbanded Darter), *Prionotus martis* (Barred Searobin), and *Sphyrna lewini* (Scalloped Hammerhead).

Bay Sampling

21.3-m Bay Seine. A total of 88,129 animals were collected in 252 21.3-m bay seines, representing 65.0% of the overall SRS catch (Table CK13-01). *Anchoa hepsetus* (n=51,023) and *A. mitchilli* (n=24,690) were the most abundant taxa, accounting for 85.9% of the 21.3-m bay seine catch (Table CK13-02). The taxa most frequently caught in 21.3-m bay seines were *A. mitchilli* (38.9% occurrence) and *Lagodon rhomboides* (31.0% occurrence).

A total of 2,888 animals from 24 Selected Taxa were collected, representing 3.3% of the entire 21.3-m bay seine catch (Table CK13-03). *Mugil cephalus* (n=1,045) and *L. xanthurus* (n=825) were the most abundant Selected Taxa, accounting for 64.8% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m bay seines were *Callinectes sapidus* (24.2% occurrence), *L. xanthurus* (21.8% occurrence), and *Menticirrhus americanus* (19.4% occurrence).

183-m Haul Seine. A total of 15,205 animals were collected in 192 183-m haul seines, representing 11.2% of the overall SRS catch (Table CK13-01). *Bairdiella chrysoura* (n=4,490), *L. rhomboides* (n=2,687), and *Dasyatis sabina* (n=1,264) were the most abundant taxa, accounting for 55.5% of the 183-m haul seine catch (Table CK13-04). The taxa most frequently caught in 183-m haul seines were *D. sabina* (71.9% occurrence), *M. cephalus* (63.5% occurrence), and *L. rhomboides* (62.0% occurrence).

A total of 3,423 animals from 27 Selected Taxa were collected, representing 22.5% of the entire 183-m haul seine catch (Table CK13-05). *Mugil cephalus* (n=908) and *L. xanthurus* (n=838) were the most abundant Selected Taxa, accounting for 51.0% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 183-m haul seines were *M. cephalus* (63.5% occurrence), *L. xanthurus* (43.8% occurrence), and *Elops saurus* (38.5% occurrence).

6.1-m Bay Otter Trawl. A total of 7,537 animals were collected in 120 6.1-m bay otter trawls, representing 5.6% of the overall SRS catch (Table CK13-01). *Anchoa mitchilli* (n=2,294) and *B. chrysoura* (n=654) were the most abundant taxa, accounting for 39.1% of the 6.1-m bay otter trawl catch (Table CK13-06). The taxa most frequently caught in 6.1-m bay otter trawls were *Etropus crossotus* (71.7% occurrence), *Ogcocephalus cubifrons* (50.8% occurrence), and *D. sabina* (40.0% occurrence).

A total of 1,116 animals from 15 Selected Taxa were collected, representing 14.8% of the entire 6.1-m bay otter trawl catch (Table CK13-07). *Menticirrhus americanus* (n=317), *Cynoscion arenarius* (n=194), and *Menippe* spp. (n=184) were the most abundant Selected Taxa, accounting for 62.3% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 6.1-m bay otter trawls were *Menippe* spp. (32.5% occurrence), *M. americanus* (30.0% occurrence), and *Farfantepenaeus duorarum* (25.8% occurrence).

River Sampling

Tidal Creeks

21.3-m River Seines. A total of 20,132 animals were collected in 108 21.3-m river seines conducted in tidal creeks, representing 14.8% of the overall SRS catch (Table CK13-01). *Anchoa mitchilli* (n=14,515), *Menidia* spp. (n=1,230), *L. xanthurus* (n=1,084), and *Eucinostomous* spp. (n=1,028) were the most abundant taxa collected, accounting for 88.7% of the total 21.3-m river seine catch in tidal creeks (Table CK13-08). The taxa most frequently caught in 21.3-m river seines conducted in tidal creeks were *Menidia* spp. (63.9% occurrence), *A. mitchilli* (55.6% occurrence), *L. rhomboides* (46.3% occurrence), and *Eucinostomous* spp. (44.4% occurrence).

A total of 1,635 animals from 13 Selected Taxa were collected, representing 8.1% of the entire 21.3-m river seine catch in tidal creeks (Table CK13-09). *Leiostomus xanthurus* (n=1,084) was the most abundant Selected Taxon, accounting for 66.3% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m river seines conducted in tidal creeks were *C. sapidus* (35.2% occurrence) and *L. xanthurus* (33.3% occurrence).

Lower Suwannee River

21.3-m River Seines. A total of 3,226 animals were collected in 60 21.3-m river seine samples conducted in the Lower Suwannee River (LSR), representing 2.4% of the overall SRS catch (Table CK13-01). *Leiostomus xanthurus* (n=645) and *Eucinostomous* spp. (n=624) were the most abundant taxa collected, accounting for 39.3% of the total 21.3-m river seine catch in the LSR (Table CK13-10). The taxa most frequently caught in 21.3-m river seines conducted in the LSR were *Eucinostomus* spp. (48.3% occurrence) and *L. rhomboides* (46.7% occurrence).

A total of 882 animals from six Selected Taxa were collected, representing 27.3% of the entire 21.3-m river seine catch in the LSR (Table CK13-11). *Leiostomus xanthurus* (n=645) and *C. sapidus* (n=130) were the most abundant Selected Taxa, accounting for 87.9% of the Selected Taxa collected by this gear. The Selected Taxon most frequently caught in 21.3-m river seines conducted in the LSR was *C. sapidus* (38.3% occurrence).

6.1-m River Otter Trawl. A total of 1,372 animals were collected in 60 6.1-m river otter trawl samples conducted in the LSR, representing 1.0% of the overall SRS catch (Table CK13-01). *Callinectes sapidus* (n=295), *A. mitchilli* (n=208), and *C. arenarius* (n=166) were the most abundant taxa collected, accounting for 48.8% of the 6.1-m river otter trawl catch (Table CK13-12). The taxa most frequently caught in 6.1-m river otter trawls conducted in the LSR were *Ictalurus punctatus* (38.3% occurrence) and *C. sapidus* (36.7% occurrence).

A total of 672 animals from 11 Selected Taxa were collected, representing 49.0% of the entire 6.1-m river otter trawl catch in the LSR (Table CK13-13). *Callinectes sapidus* (n=295), *C. arenarius* (n=166), and *L. xanthurus* (n=133) were the most abundant Selected Taxa, accounting for 88.4% of the Selected Taxa captured by this gear. The Selected Taxa most frequently caught in 6.1-m river otter trawls conducted in the LSR were *C. sapidus* (36.7% occurrence) and *L. xanthurus* (25.0% occurrence).

References

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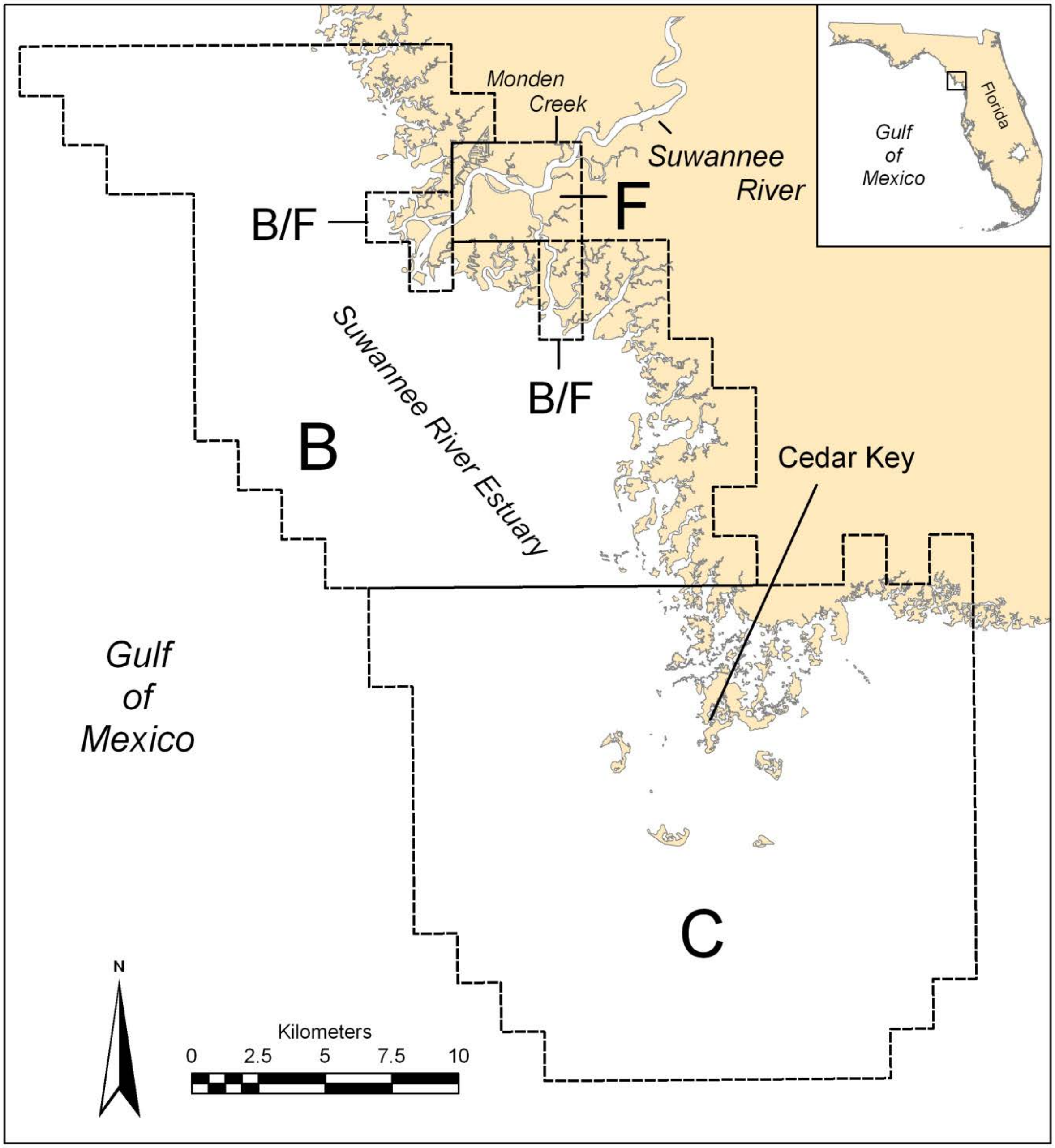

Figure CK13-01. Map of Cedar Key sampling area. Zones are labeled B, C, and F. Grids containing portions of Zones B and F are labeled B/F.

Table CK13-01. Summary of catch and effort data for Cedar Key stratified-random sampling, 2013.

Zone	**21.3-m bay seine**		**21.3-m river seine**		**183-m haul seine**		**6.1-m otter trawl**		**Totals**	
	Animals	**Hauls**	**Animals**	**Hauls**	**Animals**	**Hauls**	**Animals**	**Hauls**	**Animals**	**Hauls**
B	26,177	120	20,132	108	6,889	96	3,698	60	56,896	384
C	61,952	132	.	.	8,316	96	3,839	60	74,107	288
F	.	.	3,226	60	.	.	1,372	60	4,598	120
Totals	**88,129**	**252**	**23,358**	**168**	**15,205**	**192**	**8,909**	**180**	**135,601**	**792**

Table CK13-02. Catch statistics for 10 dominant taxa collected in 252 21.3-m bay seine samples during Cedar Key stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa hepsetus	51,023	57.9	14.3	144.62	138.29	1,517.94	34,843.57	35	0.01	19	101
Anchoa mitchilli	24,690	28.0	38.9	69.98	26.75	606.89	6,122.86	31	0.05	14	73
Membras martinica	3,266	3.7	15.9	9.26	8.02	1,375.84	2,020.71	36	0.16	17	97
Harengula jaguana	1,230	1.4	9.5	3.49	2.09	950.94	499.29	59	0.79	15	107
Mugil cephalus	1,045	1.2	13.1	2.96	1.92	1,029.43	419.29	29	0.96	16	300
Leiostomus xanthurus	825	0.9	21.8	2.34	0.83	565.35	165.71	35	0.80	10	179
Lagodon rhomboides	712	0.8	31.0	2.02	0.52	405.71	83.57	49	0.92	13	140
Menidia spp.	656	0.7	25.4	1.86	0.39	330.32	64.29	64	0.74	18	107
Orthopristis chrysoptera	630	0.7	7.5	1.79	1.21	1,079.72	298.57	41	0.54	10	103
Eucinostomus spp.	627	0.7	19.8	1.78	0.49	434.84	75.00	22	0.35	8	42
Subtotal	84,704	96.1	.	.	.	.	.	.	.	8	300
Totals	**88,129**	**100.0**	**.**	**249.80**	**141.56**	**899.61**	**34,898.57**	**.**	**.**	**3**	**805**

Table CK13-03. Catch statistics for Selected Taxa collected in 252 21.3-m bay seine samples during Cedar Key stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil cephalus	1,045	1.2	13.1	2.96	1.92	1,029.43	419.29	29	0.96	16	300
Leiostomus xanthurus	825	0.9	21.8	2.34	0.83	565.35	165.71	35	0.80	10	179
Menticirrhus americanus	233	0.3	19.4	0.66	0.13	303.27	16.43	36	2.04	9	230
Cynoscion arenarius	180	0.2	9.9	0.51	0.20	614.10	41.43	25	0.79	11	96
Sciaenops ocellatus	179	0.2	16.7	0.51	0.18	548.05	40.00	45	5.04	7	299
Callinectes sapidus	151	0.2	24.2	0.43	0.07	257.71	7.86	27	2.37	5	164
Farfantepenaeus spp.	91	0.1	13.9	0.26	0.06	348.77	7.14	7	0.30	3	14
Trachinotus falcatus	29	<0.1	3.2	0.08	0.04	693.05	5.71	67	7.22	27	142
Paralichthys albigutta	28	<0.1	7.9	0.08	0.02	372.03	2.14	54	7.76	12	171
Menticirrhus saxatilis	27	<0.1	5.2	0.08	0.03	533.81	3.57	30	3.42	9	95
Cynoscion nebulosus	15	<0.1	3.2	0.04	0.02	600.86	2.14	71	12.54	16	180
Pogonias cromis	14	<0.1	2.4	0.04	0.02	874.34	5.00	257	59.39	120	805
Micropogonias undulatus	13	<0.1	1.6	0.04	0.03	1,237.71	7.14	33	2.37	17	50
Mugil curema	12	<0.1	2.0	0.03	0.02	1,088.44	5.71	33	5.29	25	90
Elops saurus	9	<0.1	2.4	0.03	0.01	721.77	2.14	145	29.59	40	240
Farfantepenaeus duorarum	8	<0.1	1.6	0.02	0.01	927.18	2.86	26	2.04	18	34
Lutjanus synagris	7	<0.1	2.0	0.02	0.01	813.14	2.14	43	7.72	21	75

Table CK13-03. (Continued)

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Trachinotus carolinus	5	<0.1	0.4	0.01	0.01	1,587.45	3.57	44	0.68	41	45
Mugil trichodon	5	<0.1	1.2	0.01	0.01	949.09	1.43	26	2.86	15	31
Menippe spp.	3	<0.1	0.8	0.01	0.01	1,181.33	1.43	8	1.53	5	10
Albula vulpes	2	<0.1	0.8	0.01	<0.01	1,120.26	0.71	43	15.00	28	58
Lutjanus griseus	2	<0.1	0.8	0.01	<0.01	1,120.26	0.71	108	34.00	74	142
Scomberomorus maculatus	2	<0.1	0.8	0.01	<0.01	1,120.26	0.71	37	3.00	34	40
Paralichthys lethostigma	2	<0.1	0.8	0.01	<0.01	1,120.26	0.71	136	124.50	11	260
Rachycentron canadum	1	<0.1	0.4	<0.01	<0.01	1,587.45	0.71	180	.	180	180
Totals	**2,888**	**3.3**	**.**	**8.19**	**2.47**	**478.22**	**490.71**	**.**	**.**	**3**	**805**

Table CK13-04. Catch statistics for 10 dominant taxa collected in 192 183-m haul seine samples during Cedar Key stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Bairdiella chrysoura	4,490	29.5	27.6	23.39	7.80	462.33	875.00	140	0.20	92	183
Lagodon rhomboides	2,687	17.7	62.0	13.99	2.53	250.50	259.00	104	0.41	54	225
Dasyatis sabina	1,264	8.3	71.9	6.58	0.79	166.26	56.00	222	1.10	105	368
Mugil cephalus	908	6.0	63.5	4.73	0.85	248.02	107.00	220	1.93	98	395
Leiostomus xanthurus	838	5.5	43.8	4.36	0.88	279.40	123.00	137	1.06	66	272
Harengula jaguana	744	4.9	22.9	3.88	1.31	468.29	218.00	111	0.49	73	184
Ogcocephalus cubifrons	494	3.3	26.0	2.57	0.70	375.11	115.00	151	1.12	42	223
Ariopsis felis	479	3.2	42.7	2.49	0.41	225.97	53.00	229	2.33	100	382
Elops saurus	301	2.0	38.5	1.57	0.30	261.63	39.00	253	2.24	185	437
Pogonias cromis	250	1.6	27.6	1.30	0.58	612.45	108.00	274	14.06	116	899
Subtotal	12,455	81.9	.	.	.	.	.	.	.	42	899
Totals	**15,205**	**100.0**	**.**	**79.19**	**8.89**	**155.61**	**952.00**	**.**	**.**	**16**	**1,135**

Table CK13-05. Catch statistics for Selected Taxa collected in 192 183-m haul seine samples during Cedar Key stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil cephalus	908	6.0	63.5	4.73	0.85	248.02	107.00	220	1.93	98	395
Leiostomus xanthurus	838	5.5	43.8	4.36	0.88	279.40	123.00	137	1.06	66	272
Elops saurus	301	2.0	38.5	1.57	0.30	261.63	39.00	253	2.24	185	437
Pogonias cromis	250	1.6	27.6	1.30	0.58	612.45	108.00	274	14.06	116	899
Sciaenops ocellatus	198	1.3	24.5	1.03	0.25	340.99	30.00	329	10.99	70	784
Mugil curema	194	1.3	19.3	1.01	0.25	340.89	26.00	172	3.40	100	335
Paralichthys albigutta	130	0.9	29.2	0.68	0.11	231.18	9.00	164	6.69	36	402
Archosargus probatocephalus	125	0.8	20.3	0.65	0.16	333.72	16.00	281	5.30	164	403
Cynoscion nebulosus	123	0.8	28.6	0.64	0.12	254.12	13.00	239	7.50	96	437
Menticirrhus americanus	94	0.6	20.3	0.49	0.11	317.66	14.00	192	5.41	101	332
Callinectes sapidus	70	0.5	16.7	0.36	0.08	319.08	11.00	85	3.88	37	162
Micropogonias undulatus	51	0.3	4.7	0.27	0.13	659.11	17.00	165	2.81	122	215
Scomberomorus maculatus	23	0.2	8.9	0.12	0.04	410.76	5.00	291	23.68	103	555
Centropomus undecimalis	19	0.1	4.2	0.10	0.06	892.89	12.00	606	24.92	327	772
Trachinotus falcatus	18	0.1	5.2	0.09	0.03	513.78	4.00	135	15.25	50	309
Lutjanus griseus	17	0.1	6.3	0.09	0.03	458.62	4.00	157	4.15	127	186
Cynoscion arenarius	16	0.1	3.6	0.08	0.04	593.15	4.00	225	10.35	140	275

Table CK13-05. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Mugil trichodon	12	0.1	3.1	0.06	0.03	761.37	6.00	176	9.89	128	238
Farfantepenaeus duorarum	8	0.1	2.6	0.04	0.02	687.36	3.00	27	2.60	16	38
Lutjanus synagris	7	0.1	0.5	0.04	0.04	1,385.64	7.00	93	1.19	89	97
Pomatomus saltatrix	6	<0.1	1.6	0.03	0.02	977.23	4.00	154	2.12	149	161
Menticirrhus saxatilis	4	<0.1	1.0	0.02	0.01	977.23	2.00	123	3.84	116	131
Mycteroperca microlepis	4	<0.1	0.5	0.02	0.02	1,385.64	4.00	213	3.20	208	222
Rachycentron canadum	3	<0.1	1.0	0.02	0.01	1,030.63	2.00	197	12.25	180	221
Trachinotus carolinus	2	<0.1	1.0	0.01	0.01	977.23	1.00	253	68.50	184	321
Megalops atlanticus	1	<0.1	0.5	0.01	0.01	1,385.64	1.00	.	.	.	.
Paralichthys lethostigma	1	<0.1	0.5	0.01	0.01	1,385.64	1.00	396	.	396	396
Totals	**3,423**	**22.5**	**.**	**17.83**	**1.56**	**121.49**	**127.00**	**.**	**.**	**16**	**899**

Table CK13-06. Catch statistics for 10 dominant taxa collected in 120 6.1-m bay otter trawl samples during Cedar Key stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	2,294	30.4	23.3	1.58	0.66	460.33	54.42	38	0.24	16	72
Bairdiella chrysoura	654	8.7	19.2	0.46	0.19	442.98	17.54	113	0.72	14	189
Chloroscombrus chrysurus	461	6.1	10.0	0.27	0.14	572.02	13.22	19	0.27	10	78
Etropus crossotus	446	5.9	71.7	0.26	0.03	125.56	1.73	78	0.94	31	130
Portunus spp.	346	4.6	35.8	0.22	0.10	483.58	8.89	37	0.70	8	68
Menticirrhus americanus	317	4.2	30.0	0.21	0.07	345.72	5.02	59	3.41	8	267
Ariopsis felis	264	3.5	20.8	0.16	0.06	423.76	6.27	122	2.88	48	259
Lagodon rhomboides	241	3.2	29.2	0.14	0.06	439.41	5.48	89	1.40	35	138
Dasyatis sabina	224	3.0	40.0	0.14	0.04	341.82	4.69	223	2.16	112	297
Anchoa hepsetus	222	3.0	13.3	0.14	0.09	682.26	9.67	30	0.67	20	109
Subtotal	5,469	72.6	.	.	.	.	.	.	.	8	297
Totals	**7,537**	**100.0**	**.**	**4.80**	**0.89**	**204.03**	**71.96**	**.**	**.**	**4**	**796**

Table CK13-07. Catch statistics for Selected Taxa collected in 120 6.1-m bay otter trawl samples during Cedar Key stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Menticirrhus americanus	317	4.2	30.0	0.21	0.07	345.72	5.02	59	3.41	8	267
Cynoscion arenarius	194	2.6	14.2	0.13	0.09	743.67	10.19	66	3.40	12	205
Menippe spp.	184	2.4	32.5	0.10	0.04	432.17	4.72	22	0.79	4	64
Callinectes sapidus	117	1.6	15.0	0.07	0.03	531.19	3.58	66	3.12	9	183
Farfantepenaeus duorarum	102	1.4	25.8	0.06	0.01	261.76	1.01	26	0.56	16	42
Leiostomus xanthurus	79	1.1	8.3	0.05	0.02	490.97	2.02	70	5.08	12	190
Lutjanus synagris	50	0.7	13.3	0.03	0.01	358.08	0.81	44	3.64	17	85
Paralichthys albigutta	44	0.6	21.7	0.03	0.01	316.09	0.74	135	9.52	31	305
Farfantepenaeus spp.	10	0.1	5.0	0.01	<0.01	591.66	0.34	7	1.05	4	13
Cynoscion nebulosus	7	0.1	2.5	<0.01	<0.01	684.11	0.22	15	0.47	13	16
Micropogonias undulatus	4	0.1	2.5	<0.01	<0.01	645.46	0.13	58	17.32	28	88
Lutjanus griseus	3	<0.1	0.8	<0.01	<0.01	1,095.45	0.24	213	2.73	209	218
Pogonias cromis	2	<0.1	1.7	<0.01	<0.01	771.62	0.07	423	262.00	161	685
Menticirrhus saxatilis	1	<0.1	0.8	<0.01	<0.01	1,095.45	0.07	204	.	204	204
Sciaenops ocellatus	1	<0.1	0.8	<0.01	<0.01	1,095.45	0.07	94	.	94	94
Scomberomorus maculatus	1	<0.1	0.8	<0.01	<0.01	1,095.45	0.07	22	.	22	22
Totals	**1,116**	**14.8**	**.**	**0.69**	**0.15**	**233.00**	**12.82**	**.**	**.**	**4**	**685**

Table CK13-08. Catch statistics for 10 dominant taxa collected in 108 21.3-m river seine samples conducted in tidal creeks during Cedar Key stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	14,515	72.1	55.6	197.64	67.00	352.30	5,826.47	29	0.05	19	67
Menidia spp.	1,230	6.1	63.9	16.75	3.93	243.95	266.18	50	0.41	20	88
Leiostomus xanthurus	1,084	5.4	33.3	14.76	6.49	456.98	567.65	24	0.37	11	126
Eucinostomus spp.	1,028	5.1	44.4	14.00	4.20	312.10	364.71	23	0.21	8	40
Brevoortia spp.	635	3.2	15.7	8.65	4.85	582.37	497.06	26	0.16	14	78
Harengula jaguana	299	1.5	9.3	4.07	2.93	747.29	307.35	39	0.57	20	81
Lagodon rhomboides	231	1.2	46.3	3.15	0.83	274.37	72.06	29	1.17	10	113
Callinectes sapidus	184	0.9	35.2	2.51	0.87	360.96	77.94	14	0.83	5	125
Mugil cephalus	184	0.9	18.5	2.51	1.01	418.15	73.53	26	1.74	17	276
Bairdiella chrysoura	114	0.6	12.0	1.55	0.62	416.66	42.65	54	2.17	11	116
Subtotal	19,504	96.9	.	.	.	.	.	.	.	5	276
Totals	**20,132**	**100.0**	**.**	**274.13**	**67.72**	**256.74**	**5,838.24**	**.**	**.**	**3**	**316**

Table CK13-09. Catch statistics for Selected Taxa collected in 108 21.3-m river seine samples conducted in tidal creeks during Cedar Key stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Leiostomus xanthurus	1,084	5.4	33.3	14.76	6.49	456.98	567.65	24	0.37	11	126
Callinectes sapidus	184	0.9	35.2	2.51	0.87	360.96	77.94	14	0.83	5	125
Mugil cephalus	184	0.9	18.5	2.51	1.01	418.15	73.53	26	1.74	17	276
Sciaenops ocellatus	53	0.3	13.9	0.72	0.41	585.37	42.65	45	6.60	13	316
Farfantepenaeus spp.	28	0.1	14.8	0.38	0.11	290.61	7.35	8	0.71	3	14
Cynoscion arenarius	26	0.1	9.3	0.35	0.16	460.91	14.71	45	4.56	24	115
Micropogonias undulatus	21	0.1	2.8	0.29	0.26	941.91	27.94	27	1.45	15	37
Paralichthys albigutta	18	0.1	9.3	0.25	0.09	362.24	5.88	39	4.77	15	87
Menticirrhus americanus	12	0.1	4.6	0.16	0.09	594.37	8.82	36	5.97	24	98
Cynoscion nebulosus	9	<0.1	4.6	0.12	0.06	547.21	5.88	33	7.27	11	86
Lutjanus griseus	7	<0.1	4.6	0.10	0.04	484.38	2.94	122	11.43	59	146
Menippe spp.	5	<0.1	0.9	0.07	0.07	1,039.23	7.35	64	3.15	53	72
Mugil trichodon	3	<0.1	2.8	0.04	0.02	594.37	1.47	19	3.61	12	24
Farfantepenaeus duorarum	1	<0.1	0.9	0.01	0.01	1,039.23	1.47	16	.	16	16
Totals	**1,635**	**8.1**	**.**	**22.26**	**6.87**	**320.66**	**572.06**	**.**	**.**	**3**	**316**

Table CK13-10. Catch statistics for 10 dominant taxa collected in 60 21.3-m river seine samples conducted in the Lower Suwannee River (LSR) during Cedar Key stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Leiostomus xanthurus	645	20.0	20.0	15.81	11.18	547.81	664.71	35	0.42	13	59
Eucinostomus spp.	624	19.3	48.3	15.29	5.44	275.38	273.53	23	0.34	10	39
Lagodon rhomboides	380	11.8	46.7	9.31	2.56	212.71	100.00	22	0.54	8	80
Trinectes maculatus	219	6.8	38.3	5.37	2.02	291.43	76.47	18	0.39	8	59
Gambusia holbrooki	199	6.2	11.7	4.88	2.64	419.01	129.41	24	0.39	16	41
Anchoa mitchilli	139	4.3	16.7	3.41	1.64	373.32	85.29	29	0.44	20	45
Eucinostomus harengulus	133	4.1	23.3	3.26	2.15	510.87	127.94	56	1.05	40	85
Callinectes sapidus	130	4.0	38.3	3.19	0.84	203.62	35.29	22	1.25	6	109
Menidia spp.	120	3.7	28.3	2.94	1.20	316.50	60.29	50	1.28	25	82
Notropis petersoni	117	3.6	20.0	2.87	1.11	298.79	44.12	36	0.47	21	52
Subtotal	2,706	83.9	.	.	.	.	.	.	.	6	109
Totals	**3,226**	**100.0**	**.**	**79.07**	**14.80**	**144.97**	**748.53**	**.**	**.**	**4**	**353**

Table CK13-11. Catch statistics for Selected Taxa collected in 60 21.3-m river seine samples conducted in the Lower Suwannee River (LSR) during Cedar Key stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Leiostomus xanthurus	645	20.0	20.0	15.81	11.18	547.81	664.71	35	0.42	13	59
Callinectes sapidus	130	4.0	38.3	3.19	0.84	203.62	35.29	22	1.25	6	109
Sciaenops ocellatus	67	2.1	8.3	1.64	1.14	537.34	64.71	44	3.45	24	252
Mugil cephalus	33	1.0	10.0	0.81	0.47	452.14	26.47	31	2.67	20	70
Lutjanus griseus	6	0.2	5.0	0.15	0.10	543.06	5.88	134	9.26	98	159
Farfantepenaeus sp.	1	<0.1	1.7	0.02	0.02	774.60	1.47	4	.	4	4
Totals	**882**	**27.3**	**.**	**21.62**	**11.93**	**427.56**	**705.88**	**.**	**.**	**4**	**252**

Table CK13-12. Catch statistics for 10 dominant taxa collected in 60 6.1-m river otter trawl samples conducted in the Lower Suwannee River (LSR) during Cedar Key stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Callinectes sapidus	295	21.5	36.7	0.70	0.28	306.50	14.84	36	2.07	5	176
Anchoa mitchilli	208	15.2	11.7	0.55	0.36	512.58	16.19	44	0.40	26	53
Cynoscion arenarius	166	12.1	18.3	0.38	0.19	383.60	8.84	40	0.94	15	81
Leiostomus xanthurus	133	9.7	25.0	0.31	0.13	314.12	5.40	36	1.48	12	90
Ictalurus punctatus	122	8.9	38.3	0.29	0.07	194.98	2.02	78	3.59	25	232
Lagodon rhomboides	79	5.8	13.3	0.18	0.10	411.47	5.26	23	1.28	13	84
Trinectes maculatus	76	5.5	33.3	0.18	0.06	279.27	3.60	38	1.85	12	85
Ameiurus catus	73	5.3	30.0	0.17	0.05	227.04	2.10	95	5.45	13	183
Micropogonias undulatus	39	2.8	15.0	0.09	0.03	291.06	1.20	59	3.93	23	123
Bairdiella chrysoura	30	2.2	5.0	0.06	0.04	573.30	2.59	84	9.18	36	173
Subtotal	1,221	89.0	.	.	.	.	.	.	.	5	232
Totals	**1,372**	**100.0**	**.**	**3.27**	**0.69**	**162.92**	**26.98**	**.**	**.**	**5**	**772**

Table CK13-13. Catch statistics for Selected Taxa collected in 60 6.1-m river otter trawl samples conducted in the Lower Suwannee River (LSR) during Cedar Key stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Callinectes sapidus	295	21.5	36.7	0.70	0.28	306.50	14.84	36	2.07	5	176
Cynoscion arenarius	166	12.1	18.3	0.38	0.19	383.60	8.84	40	0.94	15	81
Leiostomus xanthurus	133	9.7	25.0	0.31	0.13	314.12	5.40	36	1.48	12	90
Micropogonias undulatus	39	2.8	15.0	0.09	0.03	291.06	1.20	59	3.93	23	123
Sciaenops ocellatus	21	1.5	16.7	0.05	0.02	341.97	1.20	39	5.41	10	99
Farfantepenaeus spp.	6	0.4	6.7	0.01	0.01	405.22	0.30	9	0.67	6	10
Menticirrhus americanus	3	0.2	1.7	0.01	0.01	774.60	0.45	23	7.22	9	32
Paralichthys lethostigma	3	0.2	3.3	0.01	<0.01	588.76	0.27	218	81.96	56	322
Lutjanus griseus	2	0.2	3.3	0.01	<0.01	544.03	0.17	107	40.00	67	147
Paralichthys albigutta	2	0.2	3.3	<0.01	<0.01	543.06	0.13	30	4.50	25	34
Farfantepenaeus duorarum	1	0.1	1.7	<0.01	<0.01	774.60	0.15	19	.	19	19
Cynoscion nebulosus	1	0.1	1.7	<0.01	<0.01	774.60	0.15	319	.	319	319
Totals	**672**	**49.0**	**.**	**1.58**	**0.47**	**231.82**	**21.74**	**.**	**.**	**5**	**322**

Appendix CK13-01. Monthly summary of species collected during Cedar Key stratified-random sampling, 2013. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	**Month**												**Totals**
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=66	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=792**
Acanthostracion quadricornis	.	1	.	.	1	1	.	1	1	3	2	.	10
Achirus lineatus	.	.	.	2	1	1	2	5	21	2	1	.	35
Acipenser oxyrinchus	.	.	.	.	1	.	.	.	.	.	.	.	1
Adinia xenica	.	.	1	.	.	1	.	.	.	.	.	.	2
Aetobatus narinari	.	.	.	.	.	.	.	.	1	.	1	1	3
Albula vulpes	.	.	.	.	1	1	.	.	.	.	.	.	2
Alosa alabamae	.	1	1	.	.	.	.	.	.	.	.	.	2
Aluterus schoepfii	.	.	.	2	.	2	.	.	.	.	.	.	4
Ameiurus catus	2	.	.	15	16	12	13	11	3	2	.	.	74
Anarchopterus criniger	.	.	.	.	.	.	1	.	.	.	.	.	1
Anchoa hepsetus	1	.	6	6	6	220	6	75	33	1,059	1,056	48,786	51,254
Anchoa lyolepis	.	.	.	1	5	.	11	.	.	.	.	.	17
Anchoa mitchilli	246	51	108	90	358	2,349	4,215	5,082	1,859	18,537	5,768	3,183	41,846
Ancylopsetta quadrocellata	.	2	11	14	9	.	1	4	.	3	2	.	46
Archosargus probatocephalus	.	1	16	18	6	20	5	12	5	14	4	24	125
Argopecten spp.	.	.	1	.	.	.	2	.	.	.	.	.	3
Ariopsis felis	95	3	71	122	67	171	95	134	62	58	8	46	932
Astroscopus y-graecum	2	.	1	2	.	.	.	.	.	.	.	1	6
Bagre marinus	1	.	1	3	22	22	12	25	21	67	.	2	176
Bairdiella chrysoura	550	29	1,317	1,780	700	583	21	130	72	193	194	152	5,721
Bathygobius soporator	.	.	.	1	1	.	3	1	7	.	.	1	14
Brevoortia spp.	102	21	67	63	486	71	4	8	25	40	10	68	965

Appendix CK13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=792
Calamus arctifrons	.	.	.	.	.	1	.	4	3	9	.	.	17
Callinectes sapidus	52	209	155	226	53	119	23	26	13	3	40	28	947
Callinectes similis	.	.	.	.	.	.	4	.	.	.	1	.	5
Caranx crysos	.	.	.	.	.	.	.	.	.	3	.	.	3
Caranx hippos	.	.	.	.	.	1	7	.	8	3	.	.	19
Carcharhinus limbatus	.	.	.	.	.	11	.	.	.	.	.	.	11
Centropomus undecimalis	.	.	12	.	.	.	2	1	3	1	.	.	19
Centropristis striata	.	2	.	.	6	2	1	6	4	33	7	3	64
Chaetodipterus faber	2	1	.	2	9	7	9	27	10	18	1	.	86
Chasmodes saburrae	1	.	1	.	.	3	.	.	1	.	.	.	6
Chilomycterus schoepfii	2	1	1	7	1	3	2	6	1	12	4	2	42
Chloroscombrus chrysurus	.	.	.	.	.	.	54	20	576	18	2	2	672
Citharichthys macrops	10	6	22	21	10	3	6	3	1	2	.	2	86
Citharichthys spilopterus	.	.	.	.	.	1	.	.	.	1	.	.	2
Ctenogobius boleosoma	3	60	32	52	11	3	8	7	.	1	.	2	179
Cynoscion arenarius	.	2	4	1	92	154	22	62	18	222	4	1	582
Cynoscion nebulosus	24	4	26	29	4	14	9	8	13	9	7	8	155
Cyprinodon variegatus	.	1	.	5	.	.	.	.	.	.	.	.	6
Dasyatis americana	.	.	.	.	1	.	.	.	.	.	.	.	1
Dasyatis sabina	111	58	169	185	123	133	146	79	126	170	87	155	1,542
Dasyatis say	1	.	1	13	17	55	69	4	30	37	.	.	227
Diplectrum formosum	.	1	.	3	.	3	.	.	.	.	2	1	10
Diplodus holbrookii	.	.	.	.	.	.	1	.	1	18	1	.	21

Appendix CK13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=792
Dorosoma cepedianum	.	.	5	.	.	.	1	.	.	.	.	.	6
Dorosoma petenense	.	.	1	3	4	1	.	.	.	.	.	.	9
Echeneis neucratoides	2	.	.	2	12	3	5	5	2	2	.	1	34
Elops saurus	.	1	9	.	17	27	22	25	24	59	87	39	310
Etropus crossotus	87	55	116	71	13	8	44	21	31	34	91	32	603
Eucinostomus gula	11	2	2	1	6	1	10	106	20	130	122	7	418
Eucinostomus harengulus	16	8	23	7	7	.	.	45	43	73	149	105	476
Eucinostomus spp.	231	36	22	5	.	10	180	232	210	400	643	322	2,291
Farfantepenaeus duorarum	14	13	26	30	16	2	1	11	.	.	3	4	120
Farfantepenaeus spp.	3	6	2	1	1	4	28	13	28	37	2	11	136
Floridichthys carpio	.	.	.	.	1	.	.	.	.	.	.	.	1
Fundulus confluentus	.	.	.	.	.	.	.	.	.	.	19	.	19
Fundulus grandis	21	21	25	17	8	.	5	1	4	4	.	4	110
Fundulus seminolis	17	.	.	.	.	2	1	8	2	1	21	4	56
Fundulus similis	12	22	3	6	4	7	16	43	17	.	4	49	183
Gambusia holbrooki	.	1	1	.	.	.	.	.	.	1	195	2	200
Gobiesox strumosus	.	.	.	.	.	.	1	.	1	.	.	.	2
Gobioides broussonetii	.	.	.	.	2	.	.	.	.	.	.	.	2
Gobionellus oceanicus	.	.	.	.	.	.	1	5	.	.	.	.	6
Gobiosoma bosc	1	2	1	4	.	2	2	2	.	.	14	1	29
Gobiosoma longipala	.	.	.	.	1	.	.	.	.	.	.	1	2
Gobiosoma robustum	.	.	.	1	.	1	.	.	.	.	.	.	2
Gobiosoma spp.	.	.	.	1	.	2	.	.	2	2	6	.	13

Appendix CK13-01. (Continued)

Species	**Month**												**Totals**
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=66	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=66**	**E=792**
Gymnura micrura	.	.	.	3	1	8	19	7	3	4	3	.	48
Haemulon plumierii	.	.	.	.	.	.	.	.	2	12	1	.	15
Halichoeres bivittatus	.	.	.	.	.	1	.	.	.	.	.	.	1
Harengula jaguana	2	.	.	1	43	98	608	238	210	1,068	7	3	2,278
Hemicaranx amblyrhynchus	.	.	.	.	.	.	1	.	8	2	.	.	11
Hippocampus erectus	.	.	2	1	.	.	1	.	.	1	1	1	7
Hippocampus zosterae	.	.	.	.	.	1	.	.	.	.	.	.	1
Hypleurochilus caudovittatus	.	.	.	.	.	.	4	.	.	1	2	.	7
Hyporhamphus meeki	.	.	.	.	.	1	.	.	.	2	6	.	9
Hypsoblennius hentz	.	.	.	1	.	.	6	1	.	1	1	.	10
Ictalurus punctatus	.	.	1	15	6	16	15	43	17	8	1	1	123
Labidesthes sicculus	.	.	.	.	.	2	5	1	.	.	14	6	28
Lagodon rhomboides	195	290	304	474	261	245	464	536	390	810	177	184	4,330
Leiostomus xanthurus	101	1,507	654	454	184	108	95	75	270	139	14	3	3,604
Lepisosteus osseus	.	3	.	.	2	1	2	7	4	.	.	.	19
Lepisosteus platyrhincus	.	.	.	.	.	.	.	1	.	.	.	.	1
Lepomis auritus	6	1	.	2	.	.	5	7	.	.	.	.	21
Lepomis macrochirus	2	.	.	.	.	.	1	2	.	1	1	1	8
Lepomis microlophus	.	.	.	.	.	.	.	1	.	.	.	.	1
Lepomis punctatus	1	.	.	.	.	.	1	.	.	.	34	.	36
Lepomis spp.	.	.	.	.	.	.	.	.	.	.	1	1	2
Limulus polyphemus	.	2	2	2	23	1	1	.	2	.	1	1	35
Lobotes surinamensis	.	.	.	.	.	1	.	.	.	.	1	.	2

Appendix CK13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=792
Lucania goodei	.	.	.	.	.	.	.	.	1	.	2	.	3
Lutjanus griseus	.	1	6	1	3	1	3	2	5	13	2	.	37
Lutjanus synagris	.	.	.	.	.	.	20	5	12	20	5	2	64
Megalops atlanticus	.	.	.	.	.	.	.	1	.	.	.	.	1
Membras martinica	1	.	33	4	26	56	2,902	161	40	62	4	4	3,293
Menidia spp.	143	27	203	186	37	183	309	119	397	102	155	146	2,007
Menippe spp.	7	13	15	93	4	3	33	11	2	3	1	7	192
Menticirrhus americanus	15	5	7	18	47	206	56	83	66	108	36	12	659
Menticirrhus saxatilis	.	.	.	1	9	4	2	.	2	.	8	6	32
Microgobius gulosus	.	1	.	1	1	.	1	.	.	.	.	.	4
Microgobius thalassinus	.	3	.	.	.	.	.	.	.	.	.	.	3
Micropogonias undulatus	.	2	24	16	23	16	19	6	19	3	.	.	128
Micropterus salmoides	.	.	.	.	1	.	2	.	.	.	.	.	3
Monacanthus ciliatus	.	.	2	.	.	.	1	3	6	7	1	.	20
Mugil cephalus	280	200	1,013	133	80	163	71	48	49	16	23	94	2,170
Mugil curema	43	2	2	9	1	13	10	.	21	9	15	81	206
Mugil trichodon	.	.	.	.	.	.	2	1	.	1	4	12	20
Mycteroperca microlepis	.	.	.	.	.	.	.	.	.	4	.	.	4
Myrophis punctatus	.	1	.	2	.	.	.	.	.	.	1	.	4
Narcine bancroftii	1	.	.	.	1	.	.	.	.	1	.	.	3
Negaprion brevirostris	.	.	.	.	.	.	.	1	.	.	.	.	1
Nicholsina usta	.	.	.	.	.	.	.	.	.	1	1	.	2
Notemigonus crysoleucas	.	.	.	.	.	.	.	.	4	1	.	.	5

Appendix CK13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=792
Notropis petersoni	30	42	.	1	.	.	20	3	9	1	1	11	118
Ocyurus chrysurus	.	.	.	.	.	.	.	.	.	.	1	.	1
Ogcocephalus cubifrons	45	21	53	193	27	58	49	20	67	52	101	27	713
Oligoplites saurus	.	.	.	.	.	4	39	14	23	19	1	.	100
Opisthonema oglinum	1	.	.	1	1	.	174	2	13	42	.	.	234
Opsanus beta	.	.	.	1	2	3	1	1	1	2	1	.	12
Orthopristis chrysoptera	23	4	3	6	484	102	25	137	75	117	55	1	1,032
Parablennius marmoreus	.	.	.	.	.	.	1	.	.	.	.	.	1
Paralichthys albigutta	11	20	29	25	27	24	21	7	12	24	9	13	222
Paralichthys lethostigma	1	.	.	2	1	1	1	.	.	.	.	.	6
Peprilus burti	.	.	1	1	.	.	.	.	.	.	.	1	3
Peprilus paru	.	.	.	8	.	10	6	.	.	2	1	.	27
Percina nigrofasciata	.	.	.	.	.	.	1	.	.	.	.	.	1
Poecilia latipinna	.	.	.	1	.	.	.	3	.	.	2	.	6
Pogonias cromis	15	113	18	16	20	15	12	13	13	10	14	7	266
Pomatomus saltatrix	.	.	.	.	1	5	.	.	.	.	.	.	6
Pomoxis nigromaculatus	.	.	.	.	1	.	.	1	1	1	.	.	4
Portunus spp.	222	20	17	16	3	26	23	.	1	13	31	15	387
Prionotus martis	.	1	2	8	.	.	.	.	.	.	.	.	11
Prionotus scitulus	30	30	22	14	5	4	7	3	3	1	18	18	155
Prionotus tribulus	22	17	39	34	3	9	1	.	1	9	11	15	161
Rachycentron canadum	.	.	.	.	.	.	2	1	1	.	.	.	4
Rhinoptera bonasus	8	1	.	40	5	12	7	11	2	40	1	4	131

Appendix CK13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=792
Rhizoprionodon terraenovae	.	.	.	.	.	.	2	.	.	.	.	.	2
Sardinella aurita	1	.	.	.	.	.	.	.	.	.	.	.	1
Sciaenops ocellatus	16	17	16	34	14	2	27	28	34	79	91	161	519
Scomberomorus maculatus	.	.	.	4	.	3	.	3	4	5	7	.	26
Scorpaena brasiliensis	.	.	.	.	1	.	.	.	.	.	.	.	1
Selene vomer	.	.	.	.	.	1	16	1	.	2	.	.	20
Serraniculus pumilio	.	.	.	.	.	.	.	.	1	2	.	.	3
Serranus subligarius	.	.	.	.	.	.	.	.	1	.	.	.	1
Sphoeroides nephelus	1	1	.	2	6	7	5	5	.	10	24	10	71
Sphyrna lewini	.	.	.	.	.	.	1	.	.	.	.	.	1
Sphyrna tiburo	.	.	.	.	.	2	6	2	1	4	.	.	15
Stephanolepis hispidus	1	1	.	.	4	9	3	6	7	13	.	.	44
Strongylura marina	.	10	5	6	2	1	25	2	3	7	5	2	68
Strongylura notata	.	.	.	.	.	.	7	2	6	20	4	.	39
Strongylura spp.	.	.	.	.	3	4	4	.	.	.	.	.	11
Strongylura timucu	.	.	.	.	1	2	4	.	1	5	.	.	13
Syacium papillosum	.	.	.	.	.	.	.	.	1	.	.	.	1
Symphurus plagiusa	11	13	11	13	6	16	16	3	4	22	5	1	121
Syngnathus floridae	.	2	2	.	3	12	3	32	13	12	5	3	87
Syngnathus louisianae	.	.	.	.	.	1	2	1	5	2	2	3	16
Syngnathus scovelli	1	.	.	.	2	8	2	3	1	4	.	.	21
Syngnathus springeri	.	1	.	.	.	.	.	.	.	.	.	.	1
Synodus foetens	1	1	1	6	20	28	10	3	2	8	5	2	87

Appendix CK13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=66	E=792
Trachinotus carolinus	1	.	.	.	.	.	5	.	1	.	.	.	7
Trachinotus falcatus	4	1	.	6	4	.	10	3	5	3	9	2	47
Trinectes maculatus	2	4	4	21	6	40	9	121	31	4	61	33	336
Tylosurus crocodilus	.	.	.	.	.	.	.	.	1	.	.	.	1
Urophycis floridana	.	8	5	.	.	.	.	.	.	.	.	.	13
Totals	**2,864**	**3,007**	**4,756**	**4,688**	**3,504**	**5,574**	**10,277**	**8,049**	**5,176**	**24,216**	**9,546**	**53,944**	**135,601**

Appendix CK13-02. Summary by gear, stratum, and zone of species collected during Cedar Key stratified-random sampling, 2013. Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or offshore) within 5-m. Offshore sets were post-stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 21.3-m river seine, 183-m haul seine, and 6.1-m otter trawl were not stratified. Zone B encompassed the northern portion of the universe and included all tidal creeks; Zone C encompassed the southern portion of the universe; and Zone F encompassed the lower Suwannee River. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl				
	Veg	Unveg	Shore				B	C	F	
	E=38	E=106	E=108	E=168	E=192	E=180	E=384	E=288	E=120	E=792
Acanthostracion quadricornis	2	.	.	.	.	8	.	10	.	10
Achirus lineatus	1	8	.	21	.	5	7	8	20	35
Acipenser oxyrinchus	.	.	.	.	.	1	.	.	1	1
Adinia xenica	.	.	.	2	.	.	1	.	1	2
Aetobatus narinari	.	.	.	.	3	.	.	3	.	3
Albula vulpes	.	1	1	.	.	.	1	1	.	2
Alosa alabamae	.	.	.	.	2	.	1	1	.	2
Aluterus schoepfii	.	.	.	.	.	4	2	2	.	4
Ameiurus catus	.	.	.	.	1	73	1	.	73	74
Anarchopterus criniger	.	.	1	.	.	.	.	1	.	1
Anchoa hepsetus	58	48,857	2,108	8	1	222	1,162	50,092	.	51,254
Anchoa lyolepis	.	16	.	.	.	1	.	17	.	17
Anchoa mitchilli	682	5,083	18,925	14,654	.	2,502	34,306	7,193	347	41,846
Ancylopsetta quadrocellata	.	.	.	.	25	21	12	34	.	46
Archosargus probatocephalus	.	.	.	.	125	.	68	57	.	125
Argopecten spp.	.	.	.	.	3	.	.	3	.	3
Ariopsis felis	3	151	14	.	479	285	315	596	21	932
Astroscopus y-graecum	.	3	2	1	.	.	1	5	.	6
Bagre marinus	.	23	10	.	123	20	47	126	3	176
Bairdiella chrysoura	348	56	29	114	4,490	684	3,036	2,655	30	5,721
Bathygobius soporator	.	.	2	11	.	1	10	.	4	14
Brevoortia spp.	.	49	120	685	109	2	820	95	50	965
Calamus arctifrons	2	.	.	.	8	7	.	17	.	17
Callinectes sapidus	5	62	84	314	70	412	388	134	425	947
Callinectes similis	1	.	4	.	.	.	3	2	.	5
Caranx crysos	.	.	.	.	3	.	3	.	.	3

Appendix CK13-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl				
	Veg	Unveg	Shore				B	C	F	
	E=38	E=106	E=108	E=168	E=192	E=180	E=384	E=288	E=120	E=792
Caranx hippos	.	.	1	.	18	.	11	8	.	19
Carcharhinus limbatus	.	.	.	.	11	.	3	8	.	11
Centropomus undecimalis	.	.	.	.	19	.	14	5	.	19
Centropristis striata	23	.	2	.	3	36	3	61	.	64
Chaetodipterus faber	.	2	6	.	59	19	24	62	.	86
Chasmodes saburrae	4	.	.	1	.	1	1	5	.	6
Chilomycterus schoepfii	10	1	1	.	11	19	10	32	.	42
Chloroscombrus chrysurus	.	139	16	54	2	461	664	8	.	672
Citharichthys macrops	.	2	.	1	.	83	29	57	.	86
Citharichthys spilopterus	.	.	.	.	1	1	.	1	1	2
Ctenogobius boleosoma	.	21	10	133	.	15	74	13	92	179
Cynoscion arenarius	2	121	57	26	16	360	287	129	166	582
Cynoscion nebulosus	1	3	11	9	123	8	101	53	1	155
Cyprinodon variegatus	.	.	5	1	.	.	1	5	.	6
Dasyatis americana	.	.	.	.	.	1	.	1	.	1
Dasyatis sabina	4	30	5	.	1,264	239	650	877	15	1,542
Dasyatis say	.	1	4	.	194	28	80	146	1	227
Diplectrum formosum	.	.	.	.	.	10	1	9	.	10
Diplodus holbrookii	3	.	.	.	7	11	.	21	.	21
Dorosoma cepedianum	.	.	.	.	6	.	3	3	.	6
Dorosoma petenense	.	.	.	.	9	.	2	7	.	9
Echeneis neucratoides	.	2	1	.	27	4	24	10	.	34
Elops saurus	.	1	8	.	301	.	152	158	.	310
Etropus crossotus	.	2	3	.	151	447	323	279	1	603
Eucinostomus gula	12	28	191	20	69	98	178	240	.	418
Eucinostomus harengulus	.	21	113	223	109	10	286	49	141	476
Eucinostomus spp.	23	208	396	1,652	.	12	1,284	372	635	2,291
Farfantepenaeus duorarum	4	4	.	1	8	103	65	54	1	120
Farfantepenaeus spp.	7	50	34	29	.	16	90	39	7	136
Floridichthys carpio	.	.	1	.	.	.	.	1	.	1
Fundulus confluentus	.	.	.	19	.	.	.	.	19	19
Fundulus grandis	.	1	7	101	1	.	58	.	52	110
Fundulus seminolis	.	.	.	56	.	.	1	.	55	56

Appendix CK13-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl				
	Veg	Unveg	Shore				B	C	F	
	E=38	E=106	E=108	E=168	E=192	E=180	E=384	E=288	E=120	E=792
Fundulus similis	.	.	137	36	10	.	62	117	4	183
Gambusia holbrooki	.	.	.	200	.	.	1	.	199	200
Gobiesox strumosus	.	1	1	.	.	.	2	.	.	2
Gobioides broussonetii	.	.	.	.	.	2	2	.	.	2
Gobionellus oceanicus	.	.	.	6	.	.	1	.	5	6
Gobiosoma bosc	1	3	6	15	.	4	7	7	15	29
Gobiosoma longipala	.	.	.	.	.	2	1	1	.	2
Gobiosoma robustum	.	1	1	.	.	.	1	1	.	2
Gobiosoma spp.	.	.	7	4	.	2	4	6	3	13
Gymnura micrura	.	.	.	.	45	3	6	42	.	48
Haemulon plumierii	15	.	.	.	.	.	.	15	.	15
Halichoeres bivittatus	.	.	.	.	.	1	.	1	.	1
Harengula jaguana	123	332	775	304	744	.	1,433	840	5	2,278
Hemicaranx amblyrhynchus	.	2	1	1	.	7	11	.	.	11
Hippocampus erectus	.	2	.	.	.	5	2	5	.	7
Hippocampus zosterae	1	.	.	.	.	.	.	1	.	1
Hypleurochilus caudovittatus	.	.	.	.	.	7	6	1	.	7
Hyporhamphus meeki	1	1	.	.	7	.	4	5	.	9
Hypsoblennius hentz	2	.	.	.	.	8	7	3	.	10
Ictalurus punctatus	.	.	.	1	.	122	.	.	123	123
Labidesthes sicculus	.	.	.	28	.	.	.	.	28	28
Lagodon rhomboides	436	121	155	611	2,687	320	1,131	2,740	459	4,330
Leiostomus xanthurus	1	219	605	1,729	838	212	1,747	1,079	778	3,604
Lepisosteus osseus	.	.	.	.	15	4	8	9	2	19
Lepisosteus platyrhincus	.	.	.	1	.	.	.	.	1	1
Lepomis auritus	.	.	.	21	.	.	.	.	21	21
Lepomis macrochirus	.	.	.	7	1	.	1	.	7	8
Lepomis microlophus	.	.	.	1	.	.	.	.	1	1
Lepomis punctatus	.	.	.	36	.	.	.	.	36	36
Lepomis spp.	.	.	.	2	.	.	.	.	2	2
Limulus polyphemus	.	.	2	.	30	3	8	27	.	35
Lobotes surinamensis	.	.	.	.	1	1	1	1	.	2
Lucania goodei	.	.	.	3	.	.	1	.	2	3

Appendix CK13-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl				
	Veg	Unveg	Shore				B	C	F	
	E=38	E=106	E=108	E=168	E=192	E=180	E=384	E=288	E=120	E=792
Lutjanus griseus	.	.	2	13	17	5	22	7	8	37
Lutjanus synagris	6	1	.	.	7	50	25	39	.	64
Megalops atlanticus	.	.	.	.	1	.	1	.	.	1
Membras martinica	1	3,122	143	27	.	.	3,122	169	2	3,293
Menidia spp.	.	100	556	1,350	.	1	1,642	244	121	2,007
Menippe spp.	2	.	1	5	.	184	130	62	.	192
Menticirrhus americanus	7	129	97	12	94	320	371	285	3	659
Menticirrhus saxatilis	2	14	11	.	4	1	22	10	.	32
Microgobius gulosus	.	1	2	.	.	1	1	2	1	4
Microgobius thalassinus	.	3	.	.	.	.	.	3	.	3
Micropogonias undulatus	.	13	.	21	51	43	27	62	39	128
Micropterus salmoides	.	.	.	3	.	.	.	.	3	3
Monacanthus ciliatus	12	1	1	.	.	6	2	18	.	20
Mugil cephalus	.	599	446	217	908	.	822	1,315	33	2,170
Mugil curema	1	1	10	.	194	.	153	53	.	206
Mugil trichodon	1	.	4	3	12	.	8	12	.	20
Mycteroperca microlepis	.	.	.	.	4	.	.	4	.	4
Myrophis punctatus	.	1	.	1	.	2	2	.	2	4
Narcine bancroftii	.	.	.	.	.	3	.	3	.	3
Negaprion brevirostris	.	.	.	.	1	.	.	1	.	1
Nicholsina usta	1	.	.	.	.	1	.	2	.	2
Notemigonus crysoleucas	.	.	.	5	.	.	.	.	5	5
Notropis petersoni	.	.	.	117	.	1	.	.	118	118
Ocyurus chrysurus	1	.	.	.	.	.	.	1	.	1
Ogcocephalus cubifrons	.	3	6	.	494	210	48	665	.	713
Oligoplites saurus	1	12	53	28	6	.	73	27	.	100
Opisthonema oglinum	24	166	10	13	21	.	27	207	.	234
Opsanus beta	2	.	.	.	6	4	3	8	1	12
Orthopristis chrysoptera	607	18	5	1	215	186	44	988	.	1,032
Parablennius marmoreus	.	.	.	.	.	1	.	1	.	1
Paralichthys albigutta	1	11	16	18	130	46	82	138	2	222
Paralichthys lethostigma	.	1	1	.	1	3	3	.	3	6
Peprilus burti	.	.	.	1	1	1	1	2	.	3

Appendix CK13-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl				
	Veg	Unveg	Shore				B	C	F	
	E=38	E=106	E=108	E=168	E=192	E=180	E=384	E=288	E=120	E=792
Peprilus paru	.	.	2	.	24	1	17	10	.	27
Percina nigrofasciata	.	.	.	1	.	.	.	.	1	1
Poecilia latipinna	.	.	2	4	.	.	6	.	.	6
Pogonias cromis	.	6	8	.	250	2	210	56	.	266
Pomatomus saltatrix	.	.	.	.	6	.	5	1	.	6
Pomoxis nigromaculatus	.	.	1	2	.	1	3	.	1	4
Portunus spp.	16	20	5	.	.	346	85	302	.	387
Prionotus martis	.	.	.	.	.	11	4	7	.	11
Prionotus scitulus	3	7	4	.	2	139	68	87	.	155
Prionotus tribulus	.	11	2	.	38	110	97	62	2	161
Rachycentron canadum	.	1	.	.	3	.	1	3	.	4
Rhinoptera bonasus	.	1	.	.	126	4	61	70	.	131
Rhizoprionodon terraenovae	.	.	.	.	2	.	2	.	.	2
Sardinella aurita	.	.	.	.	1	.	1	.	.	1
Sciaenops ocellatus	.	74	105	120	198	22	338	93	88	519
Scomberomorus maculatus	.	1	1	.	23	1	10	16	.	26
Scorpaena brasiliensis	.	.	.	.	.	1	.	1	.	1
Selene vomer	.	1	.	1	17	1	11	9	.	20
Serraniculus pumilio	.	2	.	.	.	1	2	1	.	3
Serranus subligarius	.	.	.	.	.	1	.	1	.	1
Sphoeroides nephelus	14	18	24	5	7	3	32	39	.	71
Sphyrna lewini	.	.	.	.	1	.	.	1	.	1
Sphyrna tiburo	.	.	.	.	15	.	3	12	.	15
Stephanolepis hispidus	14	.	.	.	2	28	7	37	.	44
Strongylura marina	.	24	2	2	40	.	46	22	.	68
Strongylura notata	.	2	11	6	20	.	9	30	.	39
Strongylura spp.	1	3	6	1	.	.	1	10	.	11
Strongylura timucu	1	1	8	2	1	.	8	5	.	13
Syacium papillosum	.	.	.	.	.	1	.	1	.	1
Symphurus plagiusa	5	25	9	13	4	65	71	33	17	121
Syngnathus floridae	77	3	1	.	.	6	4	83	.	87
Syngnathus louisianae	4	1	5	.	.	6	5	11	.	16
Syngnathus scovelli	11	5	2	1	.	2	8	13	.	21

Appendix CK13-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl				
	Veg	Unveg	Shore				B	C	F	
	E=38	E=106	E=108	E=168	E=192	E=180	E=384	E=288	E=120	E=792
Syngnathus springeri	.	.	.	.	.	1	.	1	.	1
Synodus foetens	8	9	14	1	4	51	45	42	.	87
Trachinotus carolinus	.	.	5	.	2	.	.	7	.	7
Trachinotus falcatus	.	7	22	.	18	.	14	33	.	47
Trinectes maculatus	.	18	2	222	4	90	31	10	295	336
Tylosurus crocodilus	.	.	.	.	1	.	.	1	.	1
Urophycis floridana	.	.	.	.	.	13	10	3	.	13
Totals	**2,598**	**60,064**	**25,467**	**23,358**	**15,205**	**8,909**	**56,896**	**74,107**	**4,598**	**135,601**

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Apalachicola Bay

Apalachicola Bay is a shallow, semi-enclosed estuary, located on the northwestern coast of Florida. The estuary is bounded by a barrier island complex (St. Vincent Island, Little St. George Island, St. George Island, and Dog Island) and connected to the Gulf of Mexico through four passes (Indian Pass, West Pass, East Pass, and Sikes Cut). East of Dog Island, St. George Sound is open to the Gulf (Figure AP13-01). Freshwater inflow to Apalachicola Bay primarily comes from the Apalachicola River and to a lesser extent the Carrabelle River (Livingston 1983). Shoreline vegetation consists largely of marsh grasses and bottom substrates are typically characterized as sand or mud with oyster beds scattered throughout the bay (Ingle and Dawson 1953). Less than 7% of the substrate is covered by seagrass (Continental Shelf Associates, Inc. 1985).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in Apalachicola Bay since 1998. The area sampled was divided into two geographically-defined bay zones (A and B) and one riverine zone (C; Figure AP13-01). Monthly stratified-random sampling (SRS) was conducted in Zones A and B using 21.3-m bay seines, 183-m haul seines, and 6.1-m bay otter trawls. Monthly SRS was conducted in Zone C with 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2013 in Apalachicola Bay.

Stratified-Random Sampling

A total of 189,076 animals, which included 177 taxa of fishes and 15 taxa of selected invertebrates, were collected from 840 Apalachicola Bay SRS samples in 2013 (Table AP13-01; Appendices AP13-01 and -02). *Anchoa mitchilli* (n=77,215) was the most numerous taxon collected, representing 40.8% of the total catch. *Anchoa cubana* (n=20,107) and *Lagodon rhomboides* (n=15,809) were the next most abundant taxa collected, accounting for an additional 19.0% of the total catch. Thirty Selected Taxa (n=27,770) composed 14.7% of the total catch. *Micropogonias undulatus* (n=6,348), *Mugil cephalus* (n=4,442), and *Leiostomus xanthurus* (n=3,859) were the most abundant Selected Taxa, representing 7.7% of the annual catch. Collections in 2013 included three species new to the Apalachicola Bay FIM collection: *Bathygobius mystacium* (Island Frillfin), *Prionotus alatus* (Spiny Searobin), and *Oreochromis* sp. (Tilapia species).

Bay Sampling

21.3-m Bay Seines. A total of 49,835 animals were collected in 240 21.3-m bay seines, representing 26.4% of the overall SRS catch (Table AP13-01). *Anchoa cubana* (n=10,790), *Anchoa lyolepis* (n=9,081), and *L. rhomboides* (n=6,303) were the most abundant taxa, accounting for 52.5% of the 21.3-m bay seine catch (Table AP13-02). The taxa most frequently caught in 21.3-m bay seines were *L. rhomboides* (52.9% occurrence) and *Farfantepenaeus* spp. (42.1% occurrence).

A total of 8,752 animals from 27 Selected Taxa were collected, representing 17.6% of the entire 21.3-m bay seine catch (Table AP13-03). *Leiostomus xanthurus* (n=2,177), *Mugil cephalus* (n=1,911), and *Farfantepenaeus* spp. (n=1,039) were the most abundant Selected Taxa, accounting for 58.6% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m bay seines were *Farfantepenaeus* spp. (42.1% occurrence), *Callinectes sapidus* (34.6% occurrence), and *L. xanthurus* (31.7% occurrence).

183-m Haul Seines. A total of 20,555 animals were collected in 216 183-m haul seines, representing 10.9% of the overall SRS catch (Table AP13-01). *Lagodon rhomboides* (n=7,749), *Bairdiella chrysoura* (n=3,352), and *M. cephalus* (n=2,003) were the most abundant taxa, accounting for 63.8% of the 183-m haul seine catch (Table AP13-04). The taxa most frequently caught in 183-m haul seines were *M. cephalus* (75.9% occurrence) and *L. rhomboides* (71.8% occurrence).

A total of 6,364 animals from 27 Selected Taxa were collected, representing 31.0% of the entire 183-m haul seine catch (Table AP13-05). *Mugil cephalus* (n=2,003), *L. xanthurus* (n=1,388), and *M. undulatus* (n=706) were the most abundant Selected Taxa, accounting for 64.4% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 183-m haul seines were *M. cephalus* (75.9% occurrence), *Sciaenops ocellatus* (54.2% occurrence), and *L. xanthurus* (45.8% occurrence).

6.1-m Bay Otter Trawls. A total of 61,266 animals were collected in 144 6.1-m bay otter trawls, representing 32.4% of the overall SRS catch (Table AP13-01). *Anchoa mitchilli* (n=34,071), *A. cubana* (n=9,317), and *M. undulatus* (n=3,593) were the most abundant taxa collected, accounting for 76.7% of the 6.1-m bay otter trawl catch (Table AP13-06). The taxa most frequently caught in 6.1-m bay otter trawls were *Etropus crossotus* (73.6% occurrence), *Farfantepenaeus duorarum* (56.9% occurrence), *M. undulatus* (52.1% occurrence), and *A. mitchilli* (51.4% occurrence) (Tables AP13-06 and -07).

A total of 7,667 animals from 18 Selected Taxa were collected, representing 12.5% of the entire 6.1-m bay otter trawl catch (Table AP13-07). *Micropogonias undulatus* (n=3,593) and *Cynoscion arenarius* (n=1,824) were the most abundant Selected Taxa, accounting for 70.7% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 6.1-m bay otter trawls were *F. duorarum* (56.9% occurrence) and *M. undulatus* (52.1% occurrence).

River Sampling

21.3-m River Seines. A total of 15,860 animals were collected in 156 21.3-m river seines, representing 8.4% of the overall SRS catch (Table AP13-01). *Anchoa mitchilli* (n=3,943) and *Notropis petersoni* (n=2,888) were the most abundant taxa collected, accounting for 43.1% of the 21.3-m river seine catch (Table AP13-08). The taxa most frequently caught in 21.3-m river seines were *Trinectes maculatus* (45.5% occurrence) and *C. sapidus* (37.2% occurrence) (Tables AP13-08 and -09).

A total of 931 animals from 12 Selected Taxa were collected, representing 5.9% of the entire 21.3-m river seine catch (Table AP13-09). *Mugil cephalus* (n=518) and *C. sapidus* (n=181) were the most abundant Selected Taxa, accounting for 75.1% of the Selected Taxa collected by this gear. The Selected Taxon most frequently caught in 21.3-m river seines was *C. sapidus* (37.2% occurrence).

6.1-m River Otter Trawls. A total of 41,560 animals were collected in 84 6.1-m river otter trawls, representing 22.0% of the overall SRS catch (Table AP13-01). *Anchoa mitchilli* (n=35,243) was the most abundant taxon collected, accounting for 84.8% of the 6.1-m river otter trawl catch (Table AP13-10). The taxa most frequently caught in 6.1-m river otter trawls were *T. maculatus* (59.5% occurrence), *A. mitchilli* (54.8% occurrence), *C. sapidus* (48.8% occurrence), and *M. undulatus* (42.9% occurrence).

A total of 4,056 animals from 15 Selected Taxa were collected, representing 9.8% of the entire 6.1-m river otter trawl catch (Table AP13-11). *Cynoscion arenarius* (n=1,631), *M. undulatus (*n=1,225), and *L. setiferus* (n=738) were the most abundant Selected Taxa, accounting for 88.6% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 6.1-m river otter trawls were *C. sapidus* (48.8% occurrence) and *M. undulatus* (42.9% occurrence).

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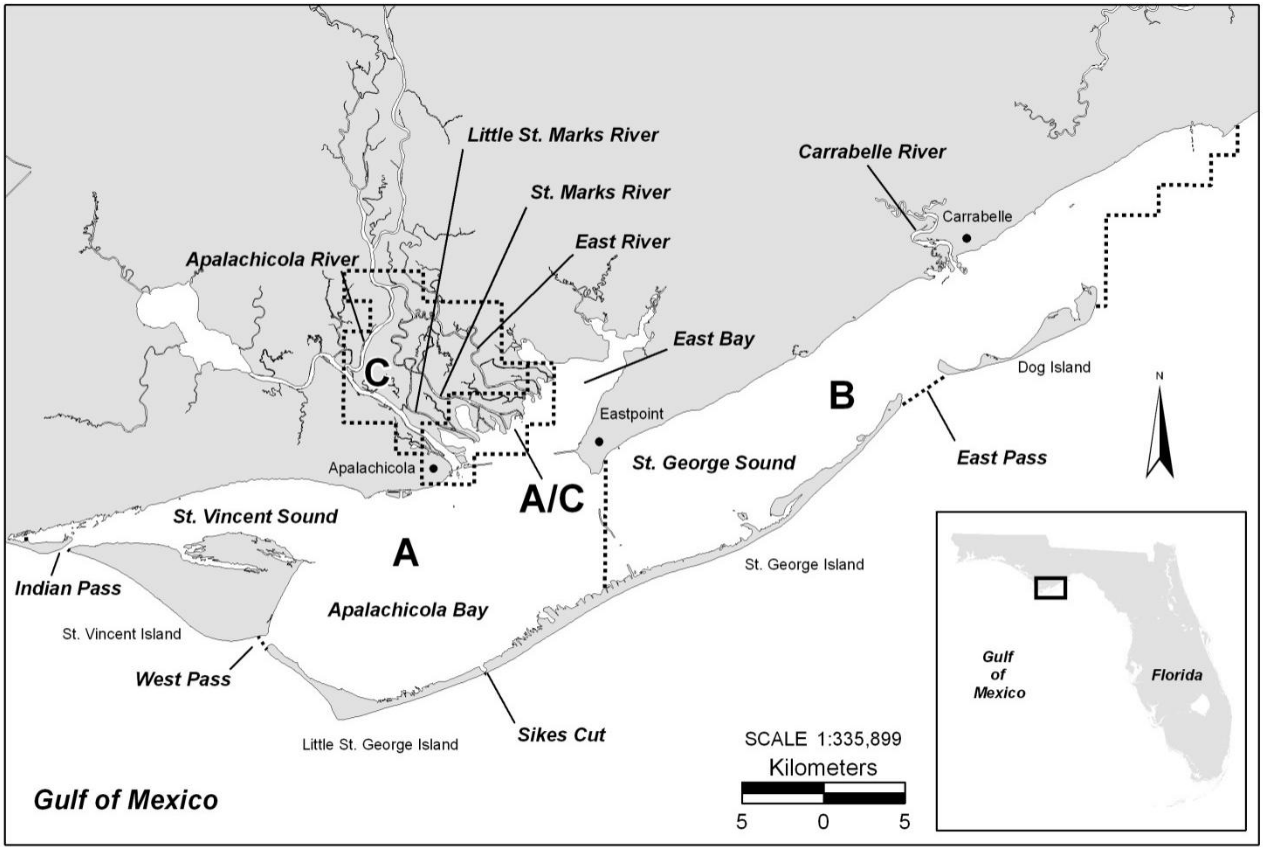

Figure AP13-01. Map of Apalachicola Bay sampling area. Zones are labeled A - C. Grids containing portions of Zones A and C are labeled A/C.

Table AP13-01. Summary of catch and effort data for Apalachicola Bay stratified-random sampling, 2013.

Zone	**21.3-m bay seine**		**21.3-m river seine**		**183-m haul seine**		**6.1-m otter trawl**		**Totals**	
	Animals	**Hauls**	**Animals**	**Hauls**	**Animals**	**Hauls**	**Animals**	**Hauls**	**Animals**	**Hauls**
A	15,105	120	.	.	6,358	108	54,780	72	76,243	300
B	34,730	120	.	.	14,197	108	6,486	72	55,413	300
C	.	.	15,860	156	.	.	41,560	84	57,420	240
Totals	**49,835**	**240**	**15,860**	**156**	**20,555**	**216**	**102,826**	**228**	**189,076**	**840**

Table AP13-02. Catch statistics for 10 dominant taxa collected in 240 21.3-m bay seine samples during Apalachicola Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa cubana	10,790	21.7	1.7	32.11	32.00	1,543.86	7,680.71	38	0.05	27	58
Anchoa lyolepis	9,081	18.2	2.9	27.03	26.26	1,505.23	6,300.71	38	0.05	27	54
Lagodon rhomboides	6,303	12.7	52.9	18.76	3.54	292.27	448.57	37	0.22	10	165
Anchoa mitchilli	3,958	7.9	22.9	11.78	3.41	447.82	546.43	31	0.13	12	62
Menidia spp.	2,876	5.8	30.0	8.56	5.08	918.69	1,208.57	41	0.23	14	97
Leiostomus xanthurus	2,177	4.4	31.7	6.48	2.76	660.35	582.14	27	0.28	10	184
Mugil cephalus	1,911	3.8	21.3	5.69	2.41	656.56	432.86	31	0.39	15	305
Orthopristis chrysoptera	1,810	3.6	20.4	5.39	1.76	505.38	333.57	35	0.46	10	156
Farfantepenaeus spp.	1,039	2.1	42.1	3.09	0.68	338.59	84.29	8	0.09	2	14
Eucinostomus spp.	812	1.6	31.7	2.42	0.50	318.95	80.00	23	0.27	8	39
Subtotal	40,757	81.8	.	.	.	.	.	.	.	2	305
Totals	**49,835**	**100.0**	**.**	**148.32**	**59.15**	**617.81**	**14,098.57**	**.**	**.**	**2**	**670**

Table AP13-03. Catch statistics for Selected Taxa collected in 240 21.3-m bay seine samples during Apalachicola Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Leiostomus xanthurus	2,177	4.4	31.7	6.48	2.76	660.35	582.14	27	0.28	10	184
Mugil cephalus	1,911	3.8	21.3	5.69	2.41	656.56	432.86	31	0.39	15	305
Farfantepenaeus spp.	1,039	2.1	42.1	3.09	0.68	338.59	84.29	8	0.09	2	14
Micropogonias undulatus	790	1.6	18.3	2.35	0.81	535.23	144.29	20	0.39	10	90
Litopenaeus setiferus	652	1.3	8.8	1.94	0.92	731.91	155.71	8	0.09	2	16
Mugil curema	618	1.2	6.7	1.84	1.61	1,358.43	386.43	33	0.54	21	135
Menticirrhus americanus	396	0.8	8.3	1.18	0.47	621.64	81.43	28	0.84	10	150
Callinectes sapidus	362	0.7	34.6	1.08	0.22	313.32	39.29	13	0.81	3	156
Cynoscion arenarius	268	0.5	9.6	0.80	0.32	618.02	62.86	24	0.54	12	56
Cynoscion nebulosus	150	0.3	15.8	0.45	0.11	388.11	19.29	44	2.91	15	373
Lutjanus synagris	122	0.2	9.6	0.36	0.12	508.04	21.43	28	1.12	15	71
Sciaenops ocellatus	98	0.2	13.8	0.29	0.08	421.50	12.14	61	10.22	9	670
Menticirrhus saxatilis	42	0.1	7.5	0.13	0.04	544.05	8.57	37	4.18	9	130
Paralichthys albigutta	36	0.1	10.4	0.11	0.03	423.84	5.71	55	8.79	12	207
Lutjanus griseus	24	0.1	5.8	0.07	0.02	446.28	2.14	35	3.56	13	80
Trachinotus carolinus	13	<0.1	0.4	0.04	0.04	1,549.19	9.29	16	0.38	14	19
Trachinotus falcatus	11	<0.1	0.4	0.03	0.03	1,549.19	7.86	25	1.14	20	29

Table AP13-03. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Farfantepenaeus aztecus	9	<0.1	0.8	0.03	0.02	1,251.76	5.00	17	0.82	15	23
Farfantepenaeus duorarum	8	<0.1	2.5	0.02	0.01	664.71	1.43	16	0.31	15	17
Cynoscion nothus	8	<0.1	0.4	0.02	0.02	1,549.19	5.71	27	0.53	25	29
Archosargus probatocephalus	5	<0.1	2.1	0.01	0.01	687.00	0.71	269	48.71	113	395
Pogonias cromis	5	<0.1	1.3	0.01	0.01	1,024.88	2.14	115	10.35	86	149
Elops saurus	2	<0.1	0.8	0.01	<0.01	1,093.15	0.71	224	21.00	203	245
Albula vulpes	2	<0.1	0.8	0.01	<0.01	1,093.15	0.71	30	7.00	23	37
Menippe sp.	1	<0.1	0.4	<0.01	<0.01	1,549.19	0.71	17	.	17	17
Mycteroperca microlepis	1	<0.1	0.4	<0.01	<0.01	1,549.19	0.71	177	.	177	177
Scomberomorus maculatus	1	<0.1	0.4	<0.01	<0.01	1,549.19	0.71	23	.	23	23
Paralichthys lethostigma	1	<0.1	0.4	<0.01	<0.01	1,549.19	0.71	340	.	340	340
Totals	**8,752**	**17.6**	**.**	**26.05**	**4.52**	**268.91**	**667.14**	**.**	**.**	**2**	**670**

Table AP13-04. Catch statistics for 10 dominant taxa collected in 216 183-m haul seine samples during Apalachicola Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	7,749	37.7	71.8	35.88	5.85	239.65	682.00	118	0.32	41	212
Bairdiella chrysoura	3,352	16.3	24.1	15.52	7.37	697.78	1,496.00	141	0.21	100	180
Mugil cephalus	2,003	9.7	75.9	9.27	1.15	182.10	143.00	281	0.99	115	428
Leiostomus xanthurus	1,388	6.8	45.8	6.43	1.11	253.59	118.00	157	1.04	42	212
Harengula jaguana	755	3.7	15.3	3.50	1.40	587.58	211.00	106	0.26	60	135
Micropogonias undulatus	706	3.4	21.8	3.27	0.84	376.20	106.00	177	0.94	79	285
Orthopristis chrysoptera	641	3.1	25.0	2.97	0.82	405.20	96.00	146	1.41	67	213
Sciaenops ocellatus	634	3.1	54.2	2.94	0.43	213.25	52.00	334	4.55	105	648
Dasyatis sabina	567	2.8	56.0	2.63	0.29	159.70	22.00	225	1.86	40	350
Mugil curema	432	2.1	33.8	2.00	0.47	341.78	64.00	169	2.40	103	332
Subtotal	18,227	88.7	.	.	.	.	.	.	.	40	648
Totals	**20,555**	**100.0**	**.**	**95.16**	**12.13**	**187.38**	**1,756.00**	**.**	**.**	**15**	**850**

Table AP13-05. Catch statistics for Selected Taxa collected in 216 183-m haul seine samples during Apalachicola Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil cephalus	2,003	9.7	75.9	9.27	1.15	182.10	143.00	281	0.99	115	428
Leiostomus xanthurus	1,388	6.8	45.8	6.43	1.11	253.59	118.00	157	1.04	42	212
Micropogonias undulatus	706	3.4	21.8	3.27	0.84	376.20	106.00	177	0.94	79	285
Sciaenops ocellatus	634	3.1	54.2	2.94	0.43	213.25	52.00	334	4.55	105	648
Mugil curema	432	2.1	33.8	2.00	0.47	341.78	64.00	169	2.40	103	332
Pogonias cromis	317	1.5	25.0	1.47	0.30	302.73	30.00	218	4.81	101	802
Cynoscion nebulosus	166	0.8	26.9	0.77	0.17	332.09	30.00	279	7.99	83	527
Elops saurus	160	0.8	23.1	0.74	0.13	256.39	12.00	280	3.86	205	495
Paralichthys albigutta	152	0.7	31.0	0.70	0.13	281.06	23.00	175	5.34	51	344
Archosargus probatocephalus	136	0.7	28.7	0.63	0.09	218.35	9.00	280	5.97	73	434
Callinectes sapidus	80	0.4	16.2	0.37	0.08	319.13	11.00	121	4.16	51	193
Menticirrhus littoralis	35	0.2	2.3	0.16	0.12	1,077.45	25.00	221	6.52	142	300
Trachinotus carolinus	26	0.1	3.2	0.12	0.06	677.22	9.00	99	2.87	77	127
Menticirrhus americanus	23	0.1	4.2	0.11	0.04	567.65	6.00	150	6.21	115	215
Cynoscion arenarius	22	0.1	2.3	0.10	0.06	813.93	10.00	264	7.27	165	306
Paralichthys lethostigma	12	0.1	4.6	0.06	0.02	511.09	3.00	301	18.73	225	462
Lutjanus griseus	12	0.1	3.2	0.06	0.02	641.80	4.00	138	11.67	43	184

Table AP13-05. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Trachinotus falcatus	11	0.1	2.3	0.05	0.03	808.41	5.00	88	7.57	48	129
Litopenaeus setiferus	11	0.1	1.4	0.05	0.03	872.43	5.00	25	1.13	20	30
Scomberomorus maculatus	10	0.1	3.2	0.05	0.02	616.90	3.00	251	25.82	160	411
Mycteroperca microlepis	7	<0.1	1.9	0.03	0.02	808.86	3.00	176	8.69	142	201
Farfantepenaeus aztecus	6	<0.1	0.5	0.03	0.03	1,469.69	6.00	21	1.49	17	27
Paralichthys squamilentus	4	<0.1	1.4	0.02	0.01	896.50	2.00	79	4.73	70	92
Lutjanus synagris	4	<0.1	0.9	0.02	0.01	1,160.27	3.00	44	16.78	20	92
Farfantepenaeus duorarum	3	<0.1	1.4	0.01	0.01	844.57	1.00	16	0.88	15	18
Pomatomus saltatrix	3	<0.1	1.4	0.01	0.01	844.57	1.00	389	29.51	340	442
Menippe sp.	1	<0.1	0.5	<0.01	<0.01	1,469.69	1.00	55	.	55	55
Totals	**6,364**	**31.0**	**.**	**29.46**	**2.41**	**120.22**	**221.00**	**.**	**.**	**15**	**802**

Table AP13-06. Catch statistics for 10 dominant taxa collected in 144 6.1-m bay otter trawl samples during Apalachicola Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	34,071	55.6	51.4	15.95	10.80	812.48	1,544.32	42	0.05	14	69
Anchoa cubana	9,317	15.2	4.2	4.18	3.95	1,135.45	568.64	31	0.07	17	59
Micropogonias undulatus	3,593	5.9	52.1	1.72	0.44	310.53	43.10	41	0.55	7	188
Anchoa hepsetus	2,511	4.1	20.8	1.13	0.87	918.30	122.00	34	0.23	12	108
Cynoscion arenarius	1,824	3.0	31.3	0.86	0.24	331.58	24.55	33	0.56	9	265
Lagodon rhomboides	1,621	2.7	21.5	0.76	0.60	941.52	85.60	51	0.58	10	196
Etropus crossotus	875	1.4	73.6	0.42	0.05	135.10	2.55	68	0.55	19	118
Litopenaeus setiferus	773	1.3	16.7	0.38	0.32	1,007.65	45.80	27	0.16	4	34
Ariopsis felis	769	1.3	27.8	0.36	0.21	695.71	28.94	70	1.20	42	299
Anchoa lyolepis	763	1.3	4.2	0.34	0.28	990.47	40.35	39	0.41	25	60
Subtotal	56,117	91.6	.	.	.	.	.	.	.	4	299
Totals	**61,266**	**100.0**	**.**	**28.54**	**12.19**	**512.38**	**1,551.61**	**.**	**.**	**2**	**740**

Table AP13-07. Catch statistics for Selected Taxa collected in 144 6.1-m bay otter trawl samples during Apalachicola Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Micropogonias undulatus	3,593	5.9	52.1	1.72	0.44	310.53	43.10	41	0.55	7	188
Cynoscion arenarius	1,824	3.0	31.3	0.86	0.24	331.58	24.55	33	0.56	9	265
Litopenaeus setiferus	773	1.3	16.7	0.38	0.32	1,007.65	45.80	27	0.16	4	34
Farfantepenaeus duorarum	566	0.9	56.9	0.27	0.06	280.13	4.97	21	0.17	15	40
Farfantepenaeus spp.	262	0.4	34.0	0.12	0.03	256.65	2.83	11	0.19	3	23
Menticirrhus americanus	156	0.3	20.8	0.07	0.03	504.22	3.78	68	3.29	12	285
Leiostomus xanthurus	116	0.2	25.7	0.06	0.02	354.87	2.06	122	4.29	9	182
Menippe spp.	95	0.2	16.0	0.05	0.01	382.30	1.63	18	1.58	3	97
Callinectes sapidus	89	0.2	25.0	0.04	0.01	270.28	0.99	62	4.14	10	177
Farfantepenaeus aztecus	78	0.1	13.9	0.04	0.01	405.44	1.35	21	0.48	15	31
Lutjanus synagris	66	0.1	14.6	0.03	0.01	447.65	1.48	31	2.09	14	89
Paralichthys albigutta	27	<0.1	12.5	0.01	<0.01	344.80	0.40	180	13.09	55	325
Cynoscion nebulosus	10	<0.1	2.1	<0.01	<0.01	875.41	0.47	70	22.75	16	180
Cynoscion nothus	3	<0.1	0.7	<0.01	<0.01	1,200.00	0.20	48	7.06	37	61
Menticirrhus saxatilis	2	<0.1	1.4	<0.01	<0.01	845.84	0.07	63	38.50	24	101
Penaeidae spp.	2	<0.1	0.7	<0.01	<0.01	1,200.00	0.13	8	2.50	5	10
Mycteroperca microlepis	2	<0.1	0.7	<0.01	<0.01	1,200.00	0.13	128	2.00	126	130

Table AP13-07. (Continued)

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Elops saurus	1	<0.1	0.7	<0.01	<0.01	1,200.00	0.07	40	.	40	40
Lutjanus griseus	1	<0.1	0.7	<0.01	<0.01	1,200.00	0.07	178	.	178	178
Paralichthys lethostigma	1	<0.1	0.7	<0.01	<0.01	1,200.00	0.06	265	.	265	265
Totals	**7,667**	**12.5**	**.**	**3.66**	**0.68**	**221.74**	**47.72**	**.**	**.**	**3**	**325**

Table AP13-08. Catch statistics for 10 dominant taxa collected in 156 21.3-m river seine samples during Apalachicola Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	3,943	24.9	32.7	37.17	10.65	357.87	1,126.47	24	0.07	16	51
Notropis petersoni	2,888	18.2	33.3	27.22	6.88	315.82	742.65	37	0.12	17	57
Lucania parva	1,282	8.1	23.1	12.09	5.30	547.34	676.47	23	0.11	11	32
Menidia spp.	1,214	7.7	28.2	11.44	3.84	418.98	494.12	39	0.42	17	90
Trinectes maculatus	1,135	7.2	45.5	10.70	2.71	316.04	320.59	16	0.16	8	64
Gambusia holbrooki	987	6.2	23.1	9.30	4.05	543.43	525.00	20	0.14	12	35
Notropis texanus	585	3.7	13.5	5.51	1.96	444.27	200.00	26	0.34	13	52
Eucinostomus spp.	529	3.3	23.1	4.99	1.69	422.68	201.47	29	0.29	9	39
Mugil cephalus	518	3.3	14.7	4.88	2.26	576.84	288.24	25	0.66	19	346
Ctenogobius boleosoma	299	1.9	30.8	2.82	0.89	392.67	120.59	24	0.26	11	44
Subtotal	13,380	84.4	.	.	.	.	.	.	.	8	346
Totals	**15,860**	**100.0**	**.**	**149.51**	**18.65**	**155.82**	**1,483.82**	**.**	**.**	**3**	**470**

Table AP13-09. Catch statistics for Selected Taxa collected in 156 21.3-m river seine samples during Apalachicola Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil cephalus	518	3.3	14.7	4.88	2.26	576.84	288.24	25	0.66	19	346
Callinectes sapidus	181	1.1	37.2	1.71	0.29	209.18	22.06	22	2.04	5	156
Leiostomus xanthurus	93	0.6	3.8	0.88	0.52	737.67	57.35	22	0.93	14	66
Mugil curema	54	0.3	1.9	0.51	0.45	1,113.63	70.59	25	0.27	21	28
Micropogonias undulatus	34	0.2	5.1	0.32	0.20	794.36	30.88	20	1.40	14	64
Litopenaeus setiferus	30	0.2	5.1	0.28	0.18	814.44	27.94	6	0.28	3	10
Farfantepenaeus spp.	10	0.1	3.2	0.09	0.06	786.11	8.82	6	0.62	5	11
Sciaenops ocellatus	4	<0.1	2.6	0.04	0.02	618.43	1.47	79	38.42	24	191
Paralichthys lethostigma	3	<0.1	1.3	0.03	0.02	928.54	2.94	87	54.85	30	197
Cynoscion arenarius	2	<0.1	1.3	0.02	0.01	880.32	1.47	36	6.50	29	42
Elops saurus	1	<0.1	0.6	0.01	0.01	1,249.00	1.47	45	.	45	45
Lutjanus griseus	1	<0.1	0.6	0.01	0.01	1,249.00	1.47	84	.	84	84
Totals	**931**	**5.9**	**.**	**8.78**	**3.15**	**447.67**	**419.12**	**.**	**.**	**3**	**346**

Table AP13-10. Catch statistics for 10 dominant taxa collected in 84 6.1-m river otter trawl samples during Apalachicola Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	35,243	84.8	54.8	55.34	25.07	415.14	1,940.10	28	0.04	15	63
Cynoscion arenarius	1,631	3.9	22.6	2.63	1.47	512.15	115.62	40	0.32	13	81
Micropogonias undulatus	1,225	3.0	42.9	1.93	0.61	291.41	37.10	25	0.45	8	203
Litopenaeus setiferus	738	1.8	14.3	1.18	0.85	656.40	70.43	6	0.08	3	15
Trinectes maculatus	659	1.6	59.5	1.06	0.31	264.19	20.78	26	0.56	7	71
Eucinostomus spp.	647	1.6	22.6	0.99	0.42	392.34	30.42	27	0.27	12	39
Notropis texanus	334	0.8	9.5	0.52	0.23	398.44	11.53	24	0.25	16	46
Callinectes sapidus	202	0.5	48.8	0.32	0.09	246.68	5.53	39	3.31	7	200
Ctenogobius boleosoma	106	0.3	27.4	0.16	0.04	231.08	1.89	24	0.64	11	44
Ictalurus punctatus	87	0.2	16.7	0.16	0.08	444.38	5.40	78	2.99	36	157
Subtotal	40,872	98.4	.	.	.	.	.	.	.	3	203
Totals	**41,560**	**100.0**	**.**	**65.40**	**25.60**	**358.76**	**1,958.04**	**.**	**.**	**3**	**620**

Table AP13-11. Catch statistics for Selected Taxa collected in 84 6.1-m river otter trawl samples during Apalachicola Bay stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	Number		% Occur	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Cynoscion arenarius	1,631	3.9	22.6	2.63	1.47	512.15	115.62	40	0.32	13	81
Micropogonias undulatus	1,225	3.0	42.9	1.93	0.61	291.41	37.10	25	0.45	8	203
Litopenaeus setiferus	738	1.8	14.3	1.18	0.85	656.40	70.43	6	0.08	3	15
Callinectes sapidus	202	0.5	48.8	0.32	0.09	246.68	5.53	39	3.31	7	200
Leiostomus xanthurus	85	0.2	15.5	0.14	0.07	493.88	5.80	93	7.88	15	207
Farfantepenaeus spp.	80	0.2	16.7	0.13	0.05	359.18	3.37	9	0.37	3	14
Pogonias cromis	25	0.1	3.6	0.04	0.02	531.75	1.35	206	8.77	145	310
Archosargus probatocephalus	24	0.1	19.0	0.04	0.01	247.66	0.54	198	13.20	83	338
Farfantepenaeus aztecus	11	<0.1	3.6	0.02	0.01	571.82	0.81	18	1.05	15	25
Mugil cephalus	10	<0.1	3.6	0.02	0.01	742.27	1.08	172	22.68	37	230
Sciaenops ocellatus	10	<0.1	1.2	0.02	0.02	916.52	1.35	27	1.57	21	36
Paralichthys lethostigma	5	<0.1	6.0	0.01	<0.01	400.17	0.13	294	36.84	209	400
Farfantepenaeus duorarum	4	<0.1	2.4	0.01	0.01	721.95	0.40	18	0.85	16	20
Lutjanus griseus	3	<0.1	3.6	0.01	<0.01	525.93	0.17	66	12.77	41	83
Cynoscion nebulosus	2	<0.1	2.4	<0.01	<0.01	644.91	0.13	240	75.00	165	315
Elops saurus	1	<0.1	1.2	<0.01	<0.01	916.52	0.13	37	.	37	37
Totals	**4,056**	**9.8**	**.**	**6.47**	**2.00**	**283.67**	**122.23**	**.**	**.**	**3**	**400**

Appendix AP13-01. Monthly summary of species collected during Apalachicola Bay stratified-random sampling, 2013. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	**Month**												**Totals**
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=70	**E=70**	**E=70**	**E=70**	**E=70**	**E=70**	**E=70**	**E=70**	**E=70**	**E=70**	**E=70**	**E=70**	**E=840**
Acanthostracion quadricornis	1	.	1	3	.	.	.	.	.	2	1	.	8
Achirus lineatus	.	.	.	.	.	.	.	1	2	.	.	.	3
Acipenser oxyrinchus	.	.	.	.	2	.	.	.	.	.	.	.	2
Adinia xenica	2	.	.	.	.	.	.	.	.	.	2	5	9
Aetobatus narinari	.	.	.	.	.	.	.	.	.	2	.	.	2
Albula vulpes	.	.	.	.	1	1	.	.	.	.	.	.	2
Alosa alabamae	2	.	1	.	.	2	.	.	.	.	.	.	5
Alosa chrysochloris	.	.	.	.	1	3	.	.	.	.	.	.	4
Alosa spp.	.	1	.	.	.	2	.	.	.	.	.	.	3
Aluterus schoepfii	.	.	.	.	.	.	.	.	.	1	.	.	1
Ameiurus catus	.	1	.	.	.	.	.	1	.	.	.	.	2
Amia calva	.	.	.	.	.	.	.	.	.	.	1	.	1
Anchoa cubana	.	.	.	.	.	.	.	.	99	9,249	10,758	1	20,107
Anchoa hepsetus	.	.	.	1	187	851	195	43	81	1,931	10	5	3,304
Anchoa lyolepis	.	.	.	.	.	351	.	.	13	659	8,821	.	9,844
Anchoa mitchilli	6,443	1,759	369	397	1,508	4,926	7,151	2,970	2,425	8,992	38,737	1,538	77,215
Anchoa spp.	.	.	.	.	.	.	1	.	3	.	.	.	4
Ancylopsetta quadrocellata	2	11	7	14	6	7	3	3	3	3	.	1	60
Archosargus probatocephalus	15	6	9	15	16	14	15	15	10	23	12	15	165
Argopecten irradians	.	1	.	.	1	.	.	.	.	.	.	.	2
Ariopsis felis	1	9	7	37	6	42	51	501	174	135	75	2	1,040
Astroscopus y-graecum	.	.	.	.	1	.	.	.	.	.	.	1	2

Appendix AP13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=840
Bagre marinus	.	.	.	6	.	9	.	12	10	1	.	.	38
Bairdiella chrysoura	50	1,520	64	112	56	314	504	426	886	449	79	50	4,510
Bathygobius mystacium	.	.	.	.	.	.	.	.	.	.	1	.	1
Bothidae sp.	.	.	1	.	.	.	.	.	.	.	.	.	1
Brevoortia spp.	1	475	95	51	139	12	43	6	68	132	.	2	1,024
Brotula barbata	.	.	.	.	.	1	.	.	.	.	.	.	1
Callinectes sapidus	167	112	67	57	56	50	64	24	44	43	65	165	914
Callinectes similis	2	24	4	9	14	61	9	3	2	.	2	2	132
Carangidae sp.	.	.	.	.	.	1	.	.	.	.	.	.	1
Caranx crysos	.	.	.	.	.	.	.	.	1	9	.	.	10
Caranx hippos	.	.	.	.	.	2	5	10	29	17	.	.	63
Caranx latus	.	.	.	.	.	.	.	.	2	5	1	.	8
Carcharhinus limbatus	.	.	.	.	.	1	.	1	.	.	.	.	2
Centropristis philadelphica	.	.	.	.	1	5	3	1	.	1	.	.	11
Centropristis striata	.	.	3	.	.	6	7	4	7	4	7	.	38
Chaetodipterus faber	.	.	.	1	2	2	9	8	52	4	.	.	78
Chasmodes saburrae	.	.	.	.	.	.	.	.	5	.	4	.	9
Chilomycterus schoepfii	1	1	7	11	8	4	5	7	10	11	13	8	86
Chloroscombrus chrysurus	3	1	.	.	.	1	.	3	16	43	3	.	70
Citharichthys macrops	.	4	4	4	4	4	3	5	3	8	5	5	49
Citharichthys spilopterus	5	6	6	11	24	41	68	21	14	5	.	.	201
Citharichthys spp.	.	.	.	.	.	.	.	.	.	.	.	2	2
Clupeidae sp.	.	.	.	.	.	.	.	.	.	.	.	1	1

Appendix AP13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=840
Ctenogobius boleosoma	121	125	63	142	59	59	40	29	70	79	75	95	957
Ctenogobius shufeldti	.	.	1	.	.	.	.	.	.	.	.	.	1
Cynoscion arenarius	7	.	.	1	359	1,318	595	277	968	145	75	2	3,747
Cynoscion nebulosus	13	10	5	15	2	13	41	36	84	55	21	33	328
Cynoscion nothus	.	.	.	.	.	.	.	.	.	11	.	.	11
Cyprinella venusta	.	.	.	.	.	7	.	1	.	.	.	13	21
Cyprinidae sp.	.	.	.	1	.	.	.	.	.	.	.	.	1
Cyprinodon variegatus	.	10	2	1	.	.	.	1	.	.	.	.	14
Cyprinus carpio	.	1	.	.	.	.	.	2	.	.	.	.	3
Dasyatis americana	.	.	.	.	1	.	1	.	.	.	.	.	2
Dasyatis sabina	27	16	29	75	93	55	75	32	115	104	47	49	717
Dasyatis say	.	.	.	.	14	8	9	5	7	17	.	.	60
Diplectrum formosum	.	.	.	1	.	.	2	1	.	1	1	.	6
Dormitator maculatus	.	.	.	.	.	.	.	1	.	.	1	.	2
Dorosoma cepedianum	.	.	.	.	.	.	3	2	.	.	.	.	5
Dorosoma petenense	.	1	.	1	.	4	22	61	16	2	.	.	107
Echeneis neucratoides	.	.	.	.	.	2	2	1	2	1	.	.	8
Eleotris amblyopsis	.	.	.	.	1	.	.	.	1	.	.	.	2
Elops saurus	.	.	2	.	4	16	16	8	44	68	3	4	165
Elops sp.	.	.	1	.	.	.	.	.	.	.	.	.	1
Enneacanthus gloriosus	1	.	.	4	.	.	.	.	.	.	46	.	51
Erimyzon sucetta	.	.	.	.	1	.	.	.	.	.	.	.	1
Erotelis smaragdus	.	.	.	.	.	1	.	.	.	.	.	.	1

Appendix AP13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=840
Esox niger	.	.	.	.	1	.	.	.	.	.	4	1	6
Etheostoma edwini	.	.	.	.	.	.	.	1	.	.	1	3	5
Etheostoma fusiforme	.	.	.	.	.	1	.	.	.	.	.	.	1
Etropus crossotus	50	62	16	45	12	32	104	117	139	98	115	131	921
Etropus cyclosquamus	.	.	5	2	2	2	1	.	.	.	.	.	12
Etropus spp.	.	.	.	.	.	.	.	.	.	.	.	5	5
Eucinostomus argenteus	.	.	.	.	.	.	1	10	3	1	.	1	16
Eucinostomus gula	3	8	3	18	6	.	22	20	34	30	100	20	264
Eucinostomus harengulus	45	2	.	.	1	1	8	29	15	36	59	29	225
Eucinostomus spp.	330	12	.	.	.	10	269	179	310	482	320	188	2,100
Farfantepenaeus aztecus	.	.	.	.	3	15	27	23	21	13	2	.	104
Farfantepenaeus duorarum	14	30	21	40	16	319	55	22	16	4	31	13	581
Farfantepenaeus spp.	50	38	10	23	121	90	165	279	185	218	170	42	1,391
Fundulus chrysotus	.	.	.	.	.	.	.	.	.	.	2	.	2
Fundulus confluentus	26	.	.	.	.	.	.	.	.	.	6	.	32
Fundulus grandis	.	5	.	10	.	.	.	6	.	3	2	1	27
Fundulus similis	.	9	6	33	.	84	.	8	.	.	.	5	145
Gambusia holbrooki	544	3	1	8	14	2	.	.	.	4	327	84	987
Gobiesox strumosus	.	.	1	.	.	.	.	.	1	.	.	.	2
Gobiidae spp.	.	.	.	2	.	.	.	.	.	.	.	.	2
Gobionellus oceanicus	.	2	.	3	.	6	1	2	2	.	.	.	16
Gobiosoma bosc	2	5	6	5	.	1	1	2	7	7	14	10	60
Gobiosoma longipala	.	.	1	.	.	.	.	.	.	.	.	.	1

Appendix AP13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=840
Gobiosoma robustum	.	2	7	4	3	.	2	2	.	.	.	.	20
Gobiosoma spp.	.	.	2	1	.	1	2	4	4	4	20	7	45
Gymnura micrura	.	.	.	12	7	10	5	1	18	15	.	1	69
Halichoeres bivittatus	.	.	.	.	.	.	17	1	1	5	.	.	24
Harengula jaguana	.	1	.	3	2	133	317	54	395	399	4	2	1,310
Hemicaranx amblyrhynchus	.	.	.	.	.	.	5	2	2	1	.	.	10
Heterandria formosa	33	1	.	1	2	.	.	.	.	.	29	6	72
Hippocampus erectus	.	.	.	1	.	.	.	1	.	1	2	8	13
Hippocampus zosterae	.	1	.	.	.	.	.	.	.	.	.	.	1
Hyporhamphus meeki	.	.	.	.	.	.	2	2	4	1	.	.	9
Hypsoblennius hentz	.	.	.	.	1	.	.	1	2	3	2	.	9
Ictalurus furcatus	.	.	.	1	2	.	6	.	11	4	.	13	37
Ictalurus punctatus	.	2	.	1	5	7	1	2	30	32	4	3	87
Labidesthes sicculus	.	.	3	7	3	3	4	5	.	29	20	2	76
Lagodon rhomboides	171	1,028	585	2,485	2,226	860	2,387	2,086	1,752	1,334	526	369	15,809
Larimus fasciatus	.	.	.	.	.	.	1	.	.	.	5	.	6
Leiostomus xanthurus	501	1,366	83	416	239	235	187	113	164	461	31	63	3,859
Lepisosteus oculatus	.	.	2	1	4	1	.	1	2	5	6	2	24
Lepisosteus osseus	.	1	.	.	.	3	1	3	.	2	3	1	14
Lepomis gulosus	.	.	1	.	.	.	.	1	.	.	3	.	5
Lepomis macrochirus	.	.	.	9	28	31	1	8	16	38	15	.	146
Lepomis microlophus	11	9	4	3	4	4	3	4	7	9	29	19	106
Lepomis punctatus	11	1	.	1	3	3	.	11	15	24	46	17	132

Appendix AP13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=840
Lepomis spp.	1	.	.	.	.	1	1	30	20	27	14	10	104
Limulus polyphemus	.	.	.	.	.	.	1	.	.	1	.	.	2
Litopenaeus setiferus	12	1	4	5	3	5	616	436	135	864	86	37	2,204
Lucania goodei	.	.	.	.	.	3	.	1	.	2	20	.	26
Lucania parva	99	2	.	8	14	37	8	226	91	30	594	783	1,892
Lutjanus griseus	.	.	.	.	.	.	.	10	21	6	4	.	41
Lutjanus spp.	.	.	.	.	.	.	.	1	.	.	.	.	1
Lutjanus synagris	.	.	.	.	.	.	41	93	30	13	14	1	192
Membras martinica	.	.	.	1	2	25	1	1	19	7	2	.	58
Menidia spp.	74	107	23	60	41	659	374	2,304	189	31	159	70	4,091
Menippe spp.	1	1	12	13	7	6	1	.	13	8	10	25	97
Menticirrhus americanus	7	2	.	2	45	162	39	38	28	70	149	33	575
Menticirrhus littoralis	.	.	.	.	1	.	3	.	25	6	.	.	35
Menticirrhus saxatilis	.	.	.	14	13	12	1	2	.	.	.	2	44
Microgobius gulosus	1	1	7	7	9	.	3	2	2	4	8	5	49
Microgobius thalassinus	5	3	3	25	5	2	53	48	73	1	13	4	235
Micropogonias undulatus	307	830	241	750	837	929	289	115	217	229	88	1,516	6,348
Micropterus salmoides	1	7	.	.	43	40	2	14	7	12	22	4	152
Micropterus sp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Minytrema melanops	.	.	.	.	.	6	.	1	.	.	.	.	7
Monacanthus ciliatus	.	.	.	.	1	.	2	.	.	.	.	.	3
Morone saxatilis	.	1	1	.	.	.	.	.	.	.	.	.	2
Moxostoma spp.	.	.	.	.	.	1	.	.	.	1	.	.	2

Appendix AP13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=840
Mugil cephalus	327	825	1,285	290	863	203	110	178	42	83	98	138	4,442
Mugil curema	7	68	17	38	133	583	9	27	41	71	53	57	1,104
Mugil spp.	.	4	1	.	.	.	.	.	.	.	.	.	5
Mycteroperca microlepis	.	.	.	.	.	.	2	2	6	.	.	.	10
Mycteroperca sp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Myrophis punctatus	.	1	.	.	.	.	.	.	.	.	1	.	2
Nicholsina usta	.	.	.	.	.	4	.	.	.	.	.	.	4
Notemigonus crysoleucas	.	.	2	.	1	7	10	11	38	17	2	2	90
Notropis maculatus	.	.	.	.	.	.	.	.	3	23	8	4	38
Notropis petersoni	.	.	.	3	5	175	19	633	459	841	512	295	2,942
Notropis spp.	.	.	.	.	11	.	1	.	.	.	.	.	12
Notropis texanus	.	.	.	1	42	582	137	28	.	4	119	6	919
Ogcocephalus cubifrons	.	.	1	3	.	.	.	.	.	1	.	2	7
Oligoplites saurus	.	.	.	.	.	10	8	29	6	5	.	.	58
Opisthonema oglinum	.	.	.	.	.	.	.	1	7	50	62	4	124
Opsanus beta	.	1	.	.	2	4	12	4	2	2	1	1	29
Opsopoeodus emiliae	.	.	.	.	2	1	5	13	.	.	.	1	22
Oreochromis sp.	.	.	.	.	.	.	.	.	.	.	.	1	1
Orthopristis chrysoptera	18	25	2	72	926	624	500	263	181	357	46	2	3,016
Ostraciidae sp.	.	.	.	.	.	.	.	.	1	.	.	.	1
Paralichthys albigutta	4	7	8	31	26	20	16	15	30	48	5	5	215
Paralichthys lethostigma	1	5	1	3	.	5	5	.	.	1	1	.	22
Paralichthys spp.	.	.	1	2	.	.	.	.	.	.	.	.	3

Appendix AP13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=840
Paralichthys squamilentus	.	.	.	.	1	3	.	.	.	.	.	.	4
Penaeidae spp.	.	.	.	.	.	.	.	.	2	.	.	.	2
Peprilus burti	.	6	12	5	8	.	.	.	.	.	6	6	43
Peprilus paru	.	.	.	.	.	.	17	.	3	4	.	.	24
Poecilia latipinna	168	.	1	.	1	.	.	.	.	.	47	8	225
Pogonias cromis	32	39	26	59	18	4	17	6	11	33	49	53	347
Pomatomus saltatrix	.	.	.	.	.	.	.	1	.	1	.	1	3
Pomoxis nigromaculatus	.	.	.	.	9	.	.	.	1	.	2	.	12
Porichthys plectrodon	.	.	.	.	.	.	9	3	.	.	.	.	12
Portunus spp.	2	11	.	8	3	17	53	4	2	4	5	17	126
Prionotus alatus	.	.	.	.	.	1	.	.	.	.	.	.	1
Prionotus longispinosus	.	.	.	.	8	26	6	.	.	.	.	.	40
Prionotus rubio	.	1	.	1	1	8	5	.	1	1	1	.	19
Prionotus scitulus	4	4	9	10	6	14	15	7	1	8	5	15	98
Prionotus tribulus	9	26	10	18	7	4	1	6	4	24	47	50	206
Raja eglanteria	1	.	.	.	.	.	.	.	.	.	.	.	1
Rhinobatos lentiginosus	.	.	.	.	.	.	.	.	.	.	1	.	1
Rhinoptera bonasus	1	1	.	8	1	1	.	.	.	2	.	.	14
Rhizoprionodon terraenovae	.	.	1	.	.	1	.	.	.	.	.	.	2
Rimapenaeus constrictus	20	15	2	2	.	5	80	29	10	3	8	14	188
Sciaenops ocellatus	52	52	30	67	33	80	70	52	34	120	94	62	746
Scomberomorus maculatus	.	.	.	3	.	1	.	3	.	4	.	.	11
Scorpaena brasiliensis	.	.	.	.	.	.	1	1	.	.	2	.	4

Appendix AP13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=840
Selene setapinnis	.	.	.	.	.	.	.	.	1	.	.	.	1
Selene vomer	.	.	.	.	1	.	4	1	11	4	.	1	22
Serraniculus pumilio	1	1	.	1	1	.	.	.	.	1	3	.	8
Serranus subligarius	.	.	.	1	.	.	.	.	.	3	1	.	5
Sicyonia brevirostris	.	.	.	.	.	.	1	.	.	.	.	.	1
Sicyonia dorsalis	1	2	.	.	.	.	.	.	.	.	.	.	3
Sicyonia laevigata	.	.	.	.	.	.	.	.	.	.	.	1	1
Sparidae spp.	.	.	1	.	.	.	.	.	.	.	.	18	19
Sphoeroides nephelus	.	.	.	.	8	9	6	3	4	9	26	3	68
Sphoeroides parvus	.	.	.	.	.	1	1	.	.	1	.	.	3
Sphoeroides spp.	.	.	.	.	8	.	.	.	.	1	5	1	15
Sphyraena borealis	.	.	.	.	.	.	2	.	.	.	.	.	2
Sphyraena guachancho	.	.	.	.	1	.	.	.	.	.	.	.	1
Sphyrna tiburo	1	.	1	.	.	.	2	2	3	3	.	.	12
Stellifer lanceolatus	.	.	.	.	.	1	3	1	7	16	.	.	28
Stenotomus caprinus	.	.	.	.	7	3	.	.	.	.	.	.	10
Stephanolepis hispidus	1	.	.	.	1	6	513	37	4	5	15	.	582
Stomolophus meleagris	.	1	.	.	.	.	1	.	.	.	.	.	2
Strongylura marina	3	4	.	1	1	2	12	4	7	.	5	4	43
Strongylura notata	.	.	.	1	.	.	.	1	.	.	2	.	4
Strongylura spp.	.	.	.	.	1	1	3	1	1	.	.	.	7
Symphurus civitatium	.	.	.	1	.	.	.	.	1	.	.	.	2
Symphurus plagiusa	20	24	4	4	2	52	19	24	24	19	27	21	240

Appendix AP13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=70	E=840
Syngnathus floridae	.	7	.	.	5	2	33	4	11	12	4	.	78
Syngnathus louisianae	1	1	.	.	3	5	17	8	2	4	8	9	58
Syngnathus scovelli	7	7	2	8	7	8	38	38	63	11	19	14	222
Syngnathus sp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Synodus foetens	4	1	4	2	52	51	79	32	20	11	13	1	270
Trachinotus carolinus	.	.	.	.	.	17	.	15	7	.	.	.	39
Trachinotus falcatus	.	.	.	.	.	.	.	3	.	18	.	1	22
Trichiurus lepturus	.	.	.	.	3	1	.	.	.	1	.	.	5
Trinectes maculatus	13	33	65	101	95	514	114	66	127	217	253	291	1,889
Tylosurus crocodilus	.	.	.	.	.	.	.	4	.	2	.	.	6
Urophycis floridana	2	5	2	3	.	.	.	.	.	.	.	3	15
Xiphopenaeus kroyeri	.	.	.	.	.	.	.	.	1	.	.	.	1
Totals	**9,863**	**8,814**	**3,284**	**5,737**	**8,599**	**14,994**	**15,928**	**12,404**	**10,471**	**28,832**	**63,503**	**6,647**	**189,076**

Appendix AP13-02. Summary by gear, stratum, and zone of species collected during Apalachicola Bay stratified-random sampling, 2013. Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or offshore) within 5-m. Offshore sets were post-stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 21.3-m river seine, 183-m haul seine, and 6.1-m otter trawl were not stratified. Zones A and B were located in Apalachicola Bay, and Zone C encompassed the lower Apalachicola River. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl				
	Veg	Unveg	Shore				A	B	C	
	E=68	E=64	E=108	E=156	E=216	E=228	E=300	E=300	E=240	E=840
Acanthostracion quadricornis	.	.	.	.	2	6	1	7	.	8
Achirus lineatus	1	.	2	.	.	.	.	3	.	3
Acipenser oxyrinchus	.	.	.	.	.	2	.	.	2	2
Adinia xenica	.	.	5	4	.	.	.	5	4	9
Aetobatus narinari	.	.	.	.	2	.	.	2	.	2
Albula vulpes	.	.	2	.	.	.	1	1	.	2
Alosa alabamae	.	.	.	.	3	2	1	2	2	5
Alosa chrysochloris	.	.	.	1	1	2	1	.	3	4
Alosa spp.	.	.	1	1	.	1	1	.	2	3
Aluterus schoepfii	.	.	.	.	.	1	.	1	.	1
Ameiurus catus	1	.	.	.	.	1	1	.	1	2
Amia calva	.	.	.	1	.	.	.	.	1	1
Anchoa cubana	.	.	10,790	.	.	9,317	9,247	10,860	.	20,107
Anchoa hepsetus	307	38	444	3	.	2,512	2,833	467	4	3,304
Anchoa lyolepis	247	9	8,825	.	.	763	670	9,174	.	9,844
Anchoa mitchilli	1,724	328	1,906	3,943	.	69,314	35,357	2,672	39,186	77,215
Anchoa spp.	.	1	.	.	.	3	2	2	.	4
Ancylopsetta quadrocellata	.	.	.	.	6	54	21	39	.	60
Archosargus probatocephalus	1	2	2	.	136	24	53	88	24	165
Argopecten irradians	.	.	.	.	1	1	1	1	.	2
Ariopsis felis	.	57	59	.	151	773	927	109	4	1,040
Astroscopus y-graecum	.	.	1	.	.	1	2	.	.	2
Bagre marinus	.	2	.	.	24	12	36	1	1	38
Bairdiella chrysoura	684	32	40	144	3,352	258	730	3,629	151	4,510
Bathygobius mystacium	.	.	.	1	.	.	.	.	1	1
Bothidae sp.	.	.	1	.	.	.	1	.	.	1
Brevoortia spp.	286	38	85	296	259	60	374	297	353	1,024

Appendix AP13-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl				
	Veg	Unveg	Shore				A	B	C	
	E=68	E=64	E=108	E=156	E=216	E=228	E=300	E=300	E=240	E=840
Brotula barbata	.	.	.	.	.	1	1	.	.	1
Callinectes sapidus	30	57	275	181	80	291	334	197	383	914
Callinectes similis	.	.	6	.	.	126	110	22	.	132
Carangidae sp.	.	.	.	.	.	1	.	1	.	1
Caranx crysos	.	.	.	.	10	.	.	10	.	10
Caranx hippos	.	3	5	.	53	2	24	39	.	63
Caranx latus	.	.	.	.	8	.	3	5	.	8
Carcharhinus limbatus	.	.	.	.	2	.	.	2	.	2
Centropristis philadelphica	.	.	.	.	.	11	.	11	.	11
Centropristis striata	11	.	2	.	3	22	4	34	.	38
Chaetodipterus faber	1	.	.	.	39	38	69	9	.	78
Chasmodes saburrae	9	.	.	.	.	.	.	9	.	9
Chilomycterus schoepfii	5	2	.	.	57	22	9	77	.	86
Chloroscombrus chrysurus	1	.	.	.	2	67	61	9	.	70
Citharichthys macrops	.	3	1	.	11	34	2	47	.	49
Citharichthys spilopterus	.	6	3	11	51	130	150	22	29	201
Citharichthys spp.	.	.	2	.	.	.	2	.	.	2
Clupeidae sp.	.	.	.	1	.	.	.	.	1	1
Ctenogobius boleosoma	121	66	302	299	.	169	352	200	405	957
Ctenogobius shufeldti	.	.	.	.	.	1	.	.	1	1
Cynoscion arenarius	.	29	239	2	22	3,455	1,823	291	1,633	3,747
Cynoscion nebulosus	87	30	33	.	166	12	113	213	2	328
Cynoscion nothus	.	8	.	.	.	3	11	.	.	11
Cyprinella venusta	.	.	.	21	.	.	.	.	21	21
Cyprinidae sp.	.	.	.	1	.	.	.	.	1	1
Cyprinodon variegatus	1	4	9	.	.	.	5	9	.	14
Cyprinus carpio	2	.	.	.	.	1	2	.	1	3
Dasyatis americana	.	.	.	.	2	.	.	2	.	2
Dasyatis sabina	1	.	13	.	567	136	356	351	10	717
Dasyatis say	.	.	.	.	58	2	9	51	.	60
Diplectrum formosum	.	.	.	.	.	6	.	6	.	6
Dormitator maculatus	.	.	.	2	.	.	.	.	2	2

Appendix AP13-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl				
	Veg	Unveg	Shore				A	B	C	
	E=68	E=64	E=108	E=156	E=216	E=228	E=300	E=300	E=240	E=840
Dorosoma cepedianum	.	.	1	.	3	1	4	.	1	5
Dorosoma petenense	27	1	35	16	17	11	50	33	24	107
Echeneis neucratoides	.	.	1	.	7	.	6	2	.	8
Eleotris amblyopsis	.	.	1	1	.	.	.	1	1	2
Elops saurus	.	.	2	1	160	2	76	87	2	165
Elops sp.	.	.	.	.	.	1	.	1	.	1
Enneacanthus gloriosus	.	.	.	51	.	.	.	.	51	51
Erimyzon sucetta	.	.	.	1	.	.	.	.	1	1
Erotelis smaragdus	.	.	.	.	.	1	1	.	.	1
Esox niger	.	.	.	6	.	.	.	.	6	6
Etheostoma edwini	.	.	.	5	.	.	.	.	5	5
Etheostoma fusiforme	.	.	.	1	.	.	.	.	1	1
Etropus crossotus	.	7	5	.	33	876	652	268	1	921
Etropus cyclosquamus	.	.	.	.	.	12	1	11	.	12
Etropus spp.	.	1	.	.	.	4	1	.	4	5
Eucinostomus argenteus	2	.	3	.	.	11	3	13	.	16
Eucinostomus gula	17	4	41	.	110	92	32	232	.	264
Eucinostomus harengulus	1	7	79	42	19	77	41	67	117	225
Eucinostomus spp.	368	85	359	529	.	759	334	590	1,176	2,100
Farfantepenaeus aztecus	9	.	.	.	6	89	75	18	11	104
Farfantepenaeus duorarum	3	3	2	.	3	570	500	77	4	581
Farfantepenaeus spp.	464	125	450	10	.	342	532	769	90	1,391
Fundulus chrysotus	.	.	.	2	.	.	.	.	2	2
Fundulus confluentus	.	.	.	32	.	.	.	.	32	32
Fundulus grandis	1	.	23	2	1	.	8	17	2	27
Fundulus similis	.	.	142	.	3	.	19	126	.	145
Gambusia holbrooki	.	.	.	987	.	.	.	.	987	987
Gobiesox strumosus	.	.	1	.	.	1	2	.	.	2
Gobiidae spp.	.	.	.	.	.	2	.	.	2	2
Gobionellus oceanicus	.	.	.	1	.	15	11	2	3	16
Gobiosoma bosc	2	3	12	34	.	9	21	1	38	60
Gobiosoma longipala	.	.	.	.	.	1	1	.	.	1

Appendix AP13-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl				
	Veg	Unveg	Shore				A	B	C	
	E=68	E=64	E=108	E=156	E=216	E=228	E=300	E=300	E=240	E=840
Gobiosoma robustum	18	.	.	.	.	2	5	15	.	20
Gobiosoma spp.	3	.	4	34	.	4	6	2	37	45
Gymnura micrura	.	.	.	.	46	23	21	48	.	69
Halichoeres bivittatus	24	.	.	.	.	.	.	24	.	24
Harengula jaguana	294	245	1	1	755	14	79	1,230	1	1,310
Hemicaranx amblyrhynchus	.	.	.	.	.	10	8	1	1	10
Heterandria formosa	.	.	.	72	.	.	.	.	72	72
Hippocampus erectus	2	.	.	.	.	11	1	12	.	13
Hippocampus zosterae	1	.	.	.	.	.	.	1	.	1
Hyporhamphus meeki	3	3	2	.	1	.	.	9	.	9
Hypsoblennius hentz	4	.	3	.	2	.	5	4	.	9
Ictalurus furcatus	.	.	.	.	.	37	.	.	37	37
Ictalurus punctatus	.	.	.	.	.	87	.	.	87	87
Labidesthes sicculus	.	.	.	76	.	.	.	.	76	76
Lagodon rhomboides	4,776	27	1,500	95	7,749	1,662	2,415	13,258	136	15,809
Larimus fasciatus	.	.	5	.	.	1	.	6	.	6
Leiostomus xanthurus	101	207	1,869	93	1,388	201	1,963	1,718	178	3,859
Lepisosteus oculatus	.	.	.	24	.	.	.	.	24	24
Lepisosteus osseus	.	.	.	10	3	1	3	.	11	14
Lepomis gulosus	.	.	.	5	.	.	.	.	5	5
Lepomis macrochirus	.	.	.	145	.	1	.	.	146	146
Lepomis microlophus	.	.	.	89	.	17	.	.	106	106
Lepomis punctatus	.	.	.	132	.	.	.	.	132	132
Lepomis spp.	1	.	.	103	.	.	1	.	103	104
Limulus polyphemus	.	.	.	.	2	.	.	2	.	2
Litopenaeus setiferus	.	31	621	30	11	1,511	1,204	232	768	2,204
Lucania goodei	.	.	.	26	.	.	.	.	26	26
Lucania parva	493	1	114	1,282	.	2	144	465	1,283	1,892
Lutjanus griseus	12	2	10	1	12	4	17	20	4	41
Lutjanus sp.	.	.	1	.	.	.	.	1	.	1
Lutjanus synagris	94	6	22	.	4	66	40	152	.	192
Membras martinica	18	16	24	.	.	.	28	30	.	58

Appendix AP13-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl				
	Veg	Unveg	Shore				A	B	C	
	E=68	E=64	E=108	E=156	E=216	E=228	E=300	E=300	E=240	E=840
Menidia spp.	191	201	2,484	1,214	.	1	2,511	365	1,215	4,091
Menippe spp.	.	.	1	.	1	95	25	72	.	97
Menticirrhus americanus	2	3	391	.	23	156	436	139	.	575
Menticirrhus littoralis	.	.	.	.	35	.	4	31	.	35
Menticirrhus saxatilis	2	18	22	.	.	2	18	26	.	44
Microgobius gulosus	15	.	22	12	.	.	11	26	12	49
Microgobius thalassinus	.	12	1	.	.	222	123	112	.	235
Micropogonias undulatus	.	160	630	34	706	4,818	4,850	239	1,259	6,348
Micropterus salmoides	3	.	.	149	.	.	3	.	149	152
Micropterus sp.	.	.	.	1	.	.	.	.	1	1
Minytrema melanops	.	.	.	7	.	.	.	.	7	7
Monacanthus ciliatus	2	.	.	.	1	.	1	2	.	3
Morone saxatilis	.	.	.	.	1	1	1	.	1	2
Moxostoma spp.	.	.	.	1	.	1	.	.	2	2
Mugil cephalus	461	106	1,344	518	2,003	10	3,089	825	528	4,442
Mugil curema	.	1	617	54	432	.	274	776	54	1,104
Mugil spp.	.	1	4	.	.	.	4	1	.	5
Mycteroperca microlepis	1	.	.	.	7	2	3	7	.	10
Mycteroperca sp.	.	.	1	.	.	.	1	.	.	1
Myrophis punctatus	1	.	1	.	.	.	.	2	.	2
Nicholsina usta	.	.	.	.	.	4	.	4	.	4
Notemigonus crysoleucas	4	.	.	86	.	.	4	.	86	90
Notropis maculatus	.	.	.	38	.	.	.	.	38	38
Notropis petersoni	2	.	.	2,888	.	52	2	.	2,940	2,942
Notropis spp.	.	.	.	2	.	10	.	.	12	12
Notropis texanus	.	.	.	585	.	334	.	.	919	919
Ogcocephalus cubifrons	.	.	.	.	1	6	1	6	.	7
Oligoplites saurus	8	7	32	.	11	.	32	26	.	58
Opisthonema oglinum	.	48	66	.	6	4	6	118	.	124
Opsanus beta	3	.	.	.	8	18	1	28	.	29
Opsopoeodus emiliae	.	.	.	20	.	2	.	.	22	22
Oreochromis sp.	.	.	.	1	.	.	.	.	1	1

Appendix AP13-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl				
	Veg	Unveg	Shore				A	B	C	
	E=68	E=64	E=108	E=156	E=216	E=228	E=300	E=300	E=240	E=840
Orthopristis chrysoptera	1,655	38	117	.	641	565	1,102	1,914	.	3,016
Ostraciidae sp.	1	.	.	.	.	.	.	1	.	1
Paralichthys albigutta	7	7	22	.	152	27	46	169	.	215
Paralichthys lethostigma	.	.	1	3	12	6	12	2	8	22
Paralichthys spp.	.	2	1	.	.	.	.	3	.	3
Paralichthys squamilentus	.	.	.	.	4	.	1	3	.	4
Penaeidae spp.	.	.	.	.	.	2	2	.	.	2
Peprilus burti	.	.	.	.	.	43	24	19	.	43
Peprilus paru	.	.	.	.	18	6	21	3	.	24
Poecilia latipinna	.	.	2	223	.	.	2	.	223	225
Pogonias cromis	.	.	5	.	317	25	259	63	25	347
Pomatomus saltatrix	.	.	.	.	3	.	.	3	.	3
Pomoxis nigromaculatus	.	.	.	11	.	1	.	.	12	12
Porichthys plectrodon	.	.	.	.	.	12	11	1	.	12
Portunus spp.	.	.	.	.	.	126	45	81	.	126
Prionotus alatus	.	.	.	.	.	1	1	.	.	1
Prionotus longispinosus	.	.	.	.	.	40	33	7	.	40
Prionotus rubio	.	.	.	.	.	19	11	8	.	19
Prionotus scitulus	3	2	8	.	.	85	21	77	.	98
Prionotus tribulus	2	9	30	.	2	163	136	45	25	206
Raja eglanteria	.	.	.	.	.	1	.	1	.	1
Rhinobatos lentiginosus	.	.	.	.	.	1	.	1	.	1
Rhinoptera bonasus	.	.	.	.	13	1	11	3	.	14
Rhizoprionodon terraenovae	.	.	.	.	.	2	.	2	.	2
Rimapenaeus constrictus	2	2	2	.	.	182	136	52	.	188
Sciaenops ocellatus	11	5	82	4	634	10	372	360	14	746
Scomberomorus maculatus	.	.	1	.	10	.	1	10	.	11
Scorpaena brasiliensis	.	.	.	.	.	4	.	4	.	4
Selene setapinnis	.	.	.	.	1	.	.	1	.	1
Selene vomer	.	.	.	.	16	6	8	14	.	22
Serraniculus pumilio	.	.	1	.	.	7	1	7	.	8
Serranus subligarius	.	.	1	.	.	4	1	4	.	5

Appendix AP13-02. (Continued)

Species	Gear and Strata						Zone			Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl				
	Veg	Unveg	Shore				A	B	C	
	E=68	E=64	E=108	E=156	E=216	E=228	E=300	E=300	E=240	E=840
Sicyonia brevirostris	.	.	.	.	.	1	.	1	.	1
Sicyonia dorsalis	.	.	.	.	.	3	3	.	.	3
Sicyonia laevigata	1	.	.	.	.	.	.	1	.	1
Sparidae spp.	15	1	3	.	.	.	2	17	.	19
Sphoeroides nephelus	5	14	25	.	15	9	20	48	.	68
Sphoeroides parvus	1	.	1	.	.	1	1	2	.	3
Sphoeroides spp.	1	5	4	.	.	5	7	8	.	15
Sphyraena borealis	2	.	.	.	.	.	.	2	.	2
Sphyraena guachancho	.	.	.	.	1	.	1	.	.	1
Sphyrna tiburo	.	.	.	.	9	3	2	10	.	12
Stellifer lanceolatus	.	.	5	.	.	23	23	5	.	28
Stenotomus caprinus	.	.	.	.	.	10	.	10	.	10
Stephanolepis hispidus	241	.	6	.	.	335	47	535	.	582
Stomolophus meleagris	.	.	.	.	1	1	1	1	.	2
Strongylura marina	6	5	12	2	18	.	19	22	2	43
Strongylura notata	.	.	4	.	.	.	2	2	.	4
Strongylura spp.	.	1	4	2	.	.	3	2	2	7
Symphurus civitatium	.	.	.	.	.	2	1	1	.	2
Symphurus plagiusa	1	17	19	.	.	203	167	49	24	240
Syngnathus floridae	43	2	2	.	.	31	3	75	.	78
Syngnathus louisianae	17	3	5	.	.	33	25	33	.	58
Syngnathus scovelli	170	.	21	19	.	12	77	122	23	222
Syngnathus sp.	1	.	.	.	.	.	1	.	.	1
Synodus foetens	43	40	30	.	4	153	81	189	.	270
Trachinotus carolinus	.	.	13	.	26	.	13	26	.	39
Trachinotus falcatus	.	.	11	.	11	.	12	10	.	22
Trichiurus lepturus	.	.	.	.	.	5	5	.	.	5
Trinectes maculatus	.	8	4	1,135	3	739	55	40	1,794	1,889
Tylosurus crocodilus	.	.	.	.	6	.	.	6	.	6
Urophycis floridana	.	.	2	.	.	13	5	10	.	15
Xiphopenaeus kroyeri	.	.	1	.	.	.	.	1	.	1
Totals	**13,181**	**2,207**	**34,447**	**15,860**	**20,555**	**102,826**	**76,243**	**55,413**	**57,420**	**189,076**

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Southern Indian River Lagoon

Along the eastern central coast of Florida, the sampling area identified as the southern Indian River Lagoon (IRL) system is a narrow estuary that extends from Vero Beach south to the Jupiter Inlet. The southern IRL is connected to the Atlantic Ocean by three inlets (Ft. Pierce, St. Lucie, and Jupiter). Freshwater inflow comes primarily from the St. Lucie and Loxahatchee rivers. In addition, there is freshwater input from numerous creeks and canals along the western shoreline. Shoreline vegetation consists largely of fringing mangrove, Brazilian pepper, and marsh grasses. Bottom substrates are typically characterized as sand or mud mixed with shell hash and oysters. Seagrasses, primarily *Halodule wrightii*, are the dominant vegetative cover in the southern IRL (Sime 2005).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in the southern IRL since 1997. The area sampled was divided into two geographically-defined bay zones (I and J) and one riverine zone (T; Figure TQ13-01). Monthly stratified-random sampling (SRS) was conducted in all zones using the 183-m haul seine. All sampling methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2013 in the southern IRL.

Stratified-Random Sampling

183-m Haul Seines. A total of 18,717 animals, which included 102 taxa of fishes and five taxa of selected invertebrates, were collected from 144 southern IRL samples in 2013 (Table TQ13-01, Appendices TQ13-01 and -02). *Lagodon rhomboides* (n=4,526) was the most numerous taxon collected, representing 24.2% of the 183-m haul seine catch (Table TQ13-02). *Diapterus auratus* (n=2,621), *Elops saurus* (n=1,357), *Mugil curema* (n=1,284), and *Ariopsis felis* (n=1,162) were the next most abundant taxa collected, accounting for an additional 34.3% of the 183-m haul seine catch. The taxa most frequently collected in the 183-m haul seine were *Archosargus probatocephalus* (77.8% occurrence), *M. curema* (67.4% occurrence), *Mugil cephalus*

(63.9% occurrence) and *D. auratus* (57.6% occurrence). Collections in 2013 included six species new to the southern IRL FIM collection: *Calamus bajonado* (Jolthead Porgy), *Charybdis hellerii* (portunid crab), *Kyphosus sectatrix* (Bermuda Chub), *Lutjanus cyanopterus* (Cubera Snapper), *Pterois spp*. (Lionfish), and *Sphyraena guachancho* (Guanchanche).

A total of 6,166 animals from 29 Selected Taxa were collected, representing 32.9% of the entire 183-m haul seine catch (Table TQ13-03). *Elops saurus* (n=1,357) and *M. curema* (n=1,284) were the most abundant Selected Taxa, accounting for 42.8% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught were *A. probatocephalus* (77.8% occurrence), *M. curema* (67.4% occurrence), and *M. cephalus* (63.9% occurrence).

Reference

Sime, P. 2005. St. Lucie Estuary and Indian River Lagoon conceptual ecological model. Wetlands 25(4):898-907.

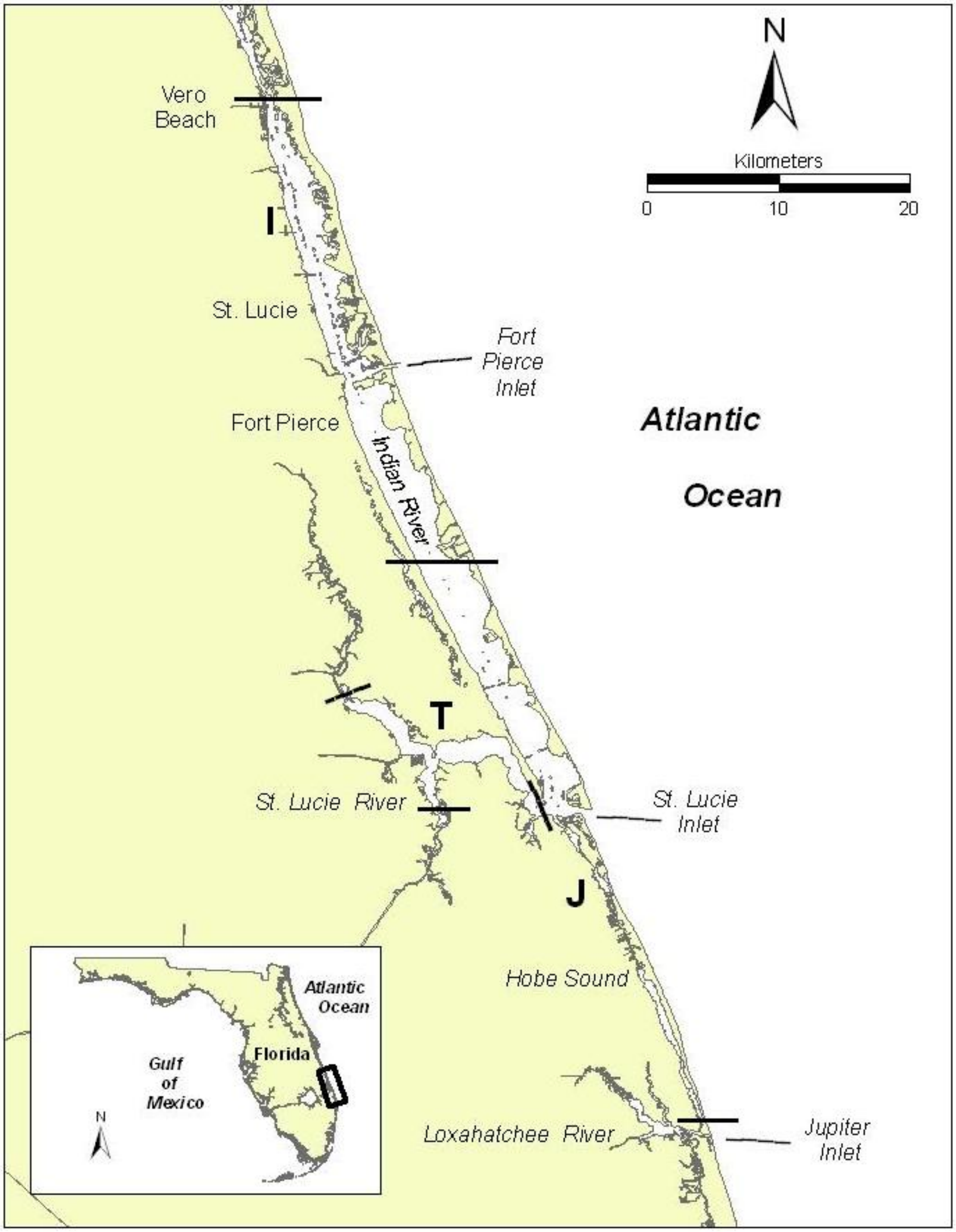

Figure TQ13-01. Map of southern Indian River Lagoon sampling area, separated into stratified three geographic zones; I, J, and T.

Table TQ13-01. Summary of catch and effort data for Southern Indian River Lagoon stratified-random sampling, 2013.

Zone	**183-m haul seine**		**Totals**	
	Animals	**Hauls**	**Animals**	**Hauls**
I	7,798	48	7,798	48
J	7,532	48	7,532	48
T	3,387	48	3,387	48
Totals	**18,717**	**144**	**18,717**	**144**

Table TQ13-02. Catch statistics for 10 dominant taxa collected in 144 183-m haul seine samples during Southern Indian River Lagoon stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	4,526	24.2	46.5	31.43	8.64	329.92	915	105	0.49	51	193
Diapterus auratus	2,621	14.0	57.6	18.20	3.97	261.79	324	155	0.70	60	296
Elops saurus	1,357	7.3	31.3	9.42	6.34	807.42	896	348	1.72	193	514
Mugil curema	1,284	6.9	67.4	8.92	2.17	291.76	258	194	0.88	80	372
Ariopsis felis	1,162	6.2	52.8	8.07	2.71	402.61	332	283	1.58	159	420
Archosargus probatocephalus	869	4.6	77.8	6.03	0.69	136.92	44	214	2.64	38	405
Orthopristis chrysoptera	836	4.5	17.4	5.81	2.42	500.62	287	103	0.80	65	210
Mugil cephalus	720	3.9	63.9	5.00	1.28	306.04	158	267	2.09	112	450
Eucinostomus gula	631	3.4	36.8	4.38	1.25	341.08	114	81	0.38	55	120
Pogonias cromis	576	3.1	40.3	4.00	1.16	347.77	142	239	1.52	140	445
Subtotal	**14,582**	**77.9**								**38**	**514**
Totals	**18,717**	**100**		**129.98**	**14.92**	**137.78**	**1174**			**31**	**900**

Table TQ13-03. Catch statistics for Selected Taxa collected in 144 183-m haul seine samples during Southern Indian River Lagoon stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Elops saurus	1,357	7.25	31.3	9.42	6.34	807.42	896	348	1.72	193	514
Mugil curema	1,284	6.86	67.4	8.92	2.17	291.76	258	194	0.88	80	372
Archosargus probatocephalus	869	4.64	77.8	6.03	0.69	136.92	44	214	2.64	38	405
Mugil cephalus	720	3.85	63.9	5.00	1.28	306.04	158	267	2.09	112	450
Pogonias cromis	576	3.08	40.3	4.00	1.16	347.77	142	239	1.52	140	445
Centropomus undecimalis	493	2.63	51.4	3.42	0.53	187.06	35	385	6.96	133	900
Lutjanus synagris	162	0.87	9.0	1.13	0.61	651.92	72	117	1.71	82	175
Lutjanus griseus	149	0.8	22.9	1.03	0.32	372.54	32	168	3.19	41	298
Lutjanus analis	133	0.71	29.2	0.92	0.16	206.89	11	154	4.02	75	266
Micropogonias undulatus	132	0.71	13.2	0.92	0.47	609.17	63	296	2.75	173	385
Sciaenops ocellatus	82	0.44	18.1	0.57	0.23	486.90	30	385	14.37	70	575
Trachinotus falcatus	38	0.2	6.9	0.26	0.12	561.51	15	122	10.47	47	321
Leiostomus xanthurus	38	0.2	8.3	0.26	0.13	612.82	18	113	6.95	62	224
Callinectes sapidus	37	0.2	15.3	0.26	0.06	259.33	3	113	6.33	46	177
Trachinotus carolinus	23	0.12	3.5	0.16	0.09	693.25	12	243	12.96	138	385
Cynoscion nebulosus	15	0.08	6.9	0.10	0.04	404.89	3	316	41.03	69	581
Paralichthys albigutta	15	0.08	5.6	0.10	0.06	668.96	8	147	16.15	77	303

Table TQ13-03. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Scomberomorus maculatus	11	0.06	4.9	0.08	0.03	538.08	4	329	10.71	275	387
Pomatomus saltatrix	8	0.04	2.1	0.06	0.04	818.32	5	402	12.07	373	453
Mycteroperca microlepis	4	0.02	2.1	0.03	0.02	730.55	2	236	53.82	139	390
Epinephelus itajara	3	0.02	2.1	0.02	0.01	687.96	1	190	38.2	115	241
Paralichthys lethostigma	3	0.02	2.1	0.02	0.01	687.96	1	352	48.24	299	448
Megalops atlanticus	3	0.02	0.7	0.02	0.02	1200.00	3	531	16.01	499	548
Cynoscion complex	3	0.02	0.7	0.02	0.02	1200.00	3	296	19.63	262	330
Lutjanus apodus	2	0.01	1.4	0.01	0.01	845.56	1	79	4.5	74	83
Scomberomorus regalis	2	0.01	1.4	0.01	0.01	845.56	1	229	1.5	227	230
Panulirus argus	2	0.01	0.7	0.01	0.01	1200.00	2	80	4.5	75	84
Albula vulpes	1	0.01	0.7	0.01	0.01	1200.00	1	196	.	196	196
Lutjanus cyanopterus	1	0.01	0.7	0.01	0.01	1200.00	1	237	.	237	237
Totals	**6166**	**32.94**	**98.6**	**42.82**	**7.11**	**199.14**	**917**	**.**	**.**	**38**	**900**

Appendix TQ13-01. Monthly summary of species collected during southern Indian River Lagoon stratified-random sampling, 2013. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=144
Acanthostracion quadricornis	.	.	.	.	.	.	.	.	.	.	6	.	6
Achirus lineatus	.	.	.	.	1	.	.	1	2	2	.	.	6
Aetobatus narinari	.	1	.	.	.	.	.	.	.	.	.	.	1
Albula vulpes	.	.	1	.	.	.	.	.	.	.	.	.	1
Anisotremus virginicus	.	.	.	.	.	.	.	.	.	1	.	.	1
Archosargus probatocephalus	44	36	50	30	65	59	148	52	93	88	119	85	869
Archosargus rhomboidalis	5	44	95	16	47	13	33	23	54	10	16	30	386
Archosargus spp.	.	3	.	.	.	.	.	.	.	.	.	.	3
Ariopsis felis	97	19	38	281	50	375	88	40	49	57	44	24	1,162
Bagre marinus	.	.	.	1	.	.	.	.	.	.	.	.	1
Bairdiella chrysoura	1	.	12	5	.	.	.	.	20	.	5	3	46
Belonidae spp.	.	.	.	3	.	.	.	.	.	.	.	.	3
Brevoortia spp.	.	.	.	.	1	15	8	.	2	.	.	21	47
Calamus arctifrons	.	.	.	.	2	1	.	6	.	1	2	.	12
Calamus bajonado	.	.	.	.	.	.	.	.	.	.	2	.	2
Callinectes ornatus	.	.	.	.	6	.	3	.	1	.	1	.	11
Callinectes sapidus	2	2	4	4	3	2	5	2	5	6	.	2	37
Callinectes similis	.	.	.	.	.	.	.	.	.	1	.	.	1
Caranx bartholomaei	.	.	.	.	.	.	.	1	1	.	.	.	2
Caranx crysos	.	.	6	.	3	.	.	.	.	.	.	.	9
Caranx hippos	70	7	25	10	10	9	8	3	2	8	10	78	240
Caranx latus	4	2	3	.	1	1	1	.	5	2	4	12	35

Appendix TQ13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=144
Centropomus undecimalis	24	27	12	26	13	44	75	47	61	46	42	76	493
Chaetodipterus faber	.	1	.	.	.	.	5	.	.	.	.	.	6
Charybdis hellerii	.	.	.	.	.	.	.	.	.	.	.	1	1
Chilomycterus schoepfii	14	10	10	10	7	8	7	10	3	8	15	10	112
Citharichthys spilopterus	.	1	1	.	1	2	14	4	1	2	.	.	26
Cynoscion complex	.	.	.	.	.	.	3	.	.	.	.	.	3
Cynoscion nebulosus	.	.	3	2	1	1	.	1	.	2	4	1	15
Dasyatis sabina	9	1	2	15	22	16	54	9	13	17	10	13	181
Dasyatis say	.	3	7	7	10	1	8	1	3	8	6	5	59
Diapterus auratus	323	239	221	135	314	465	191	85	107	97	76	368	2,621
Diodon holocanthus	.	.	.	.	.	.	.	1	.	.	1	.	2
Diplodus holbrooki	.	.	.	.	.	2	.	.	.	.	.	13	15
Dorosoma cepedianum	.	.	.	.	.	.	.	.	1	.	.	.	1
Dorosoma petenense	.	.	.	.	.	.	.	.	.	1	.	.	1
Echeneis sp.	1	.	.	.	.	.	.	.	.	.	.	.	1
Elops saurus	13	6	1,079	10	38	2	8	3	9	62	14	113	1,357
Epinephelus itajara	.	.	.	.	.	1	.	.	.	.	2	.	3
Eucinostomus gula	3	26	44	6	122	61	34	78	121	55	44	37	631
Eucinostomus harengulus	.	10	25	38	12	35	5	94	4	4	26	.	253
Eucinostomus jonesii	.	1	3	1	2	.	.	.	.	.	.	.	7
Eucinostomus melanopterus	3	1	.	10	3	.	2	.	.	1	1	4	25
Eugerres plumieri	.	.	.	.	6	10	9	4	.	5	1	.	35
Gerres cinereus	9	4	3	3	18	12	3	5	8	2	10	4	81

Appendix TQ13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=144
Gymnura micrura	5	1	.	1	1	.	.	.	.	2	1	1	12
Haemulon aurolineatum	.	.	.	.	.	.	.	2	2	1	1	.	6
Haemulon parra	.	.	.	.	.	.	.	4	9	.	.	2	15
Haemulon plumieri	.	.	.	.	.	.	.	27	1	1	2	.	31
Haemulon sciurus	.	.	.	.	.	.	.	.	.	9	3	.	12
Harengula jaguana	7	.	.	.	.	1	.	.	.	74	20	14	116
Hemiramphus brasiliensis	1	.	.	.	.	.	.	.	.	.	.	.	1
Hippocampus erectus	.	.	.	.	1	.	.	.	.	.	1	.	2
Hyporhamphus unifasciatus	.	.	1	.	.	.	.	.	.	.	.	.	1
Kyphosus saltatrix	.	.	.	.	.	.	.	.	.	.	.	11	11
Lachnolaimus maximus	.	.	.	2	.	.	2	21	.	8	2	.	35
Lactophrys trigonus	.	.	5	.	3	3	.	5	4	.	9	.	29
Lagodon rhomboides	6	107	70	82	87	448	570	780	1,303	504	287	282	4,526
Leiostomus xanthurus	2	1	1	1	9	3	20	.	1	.	.	.	38
Lepisosteus osseus	.	.	.	.	.	.	.	1	.	1	.	.	2
Lobotes surinamensis	.	.	.	1	.	.	.	.	.	.	.	.	1
Lutjanus analis	4	11	5	4	11	11	11	8	14	18	31	5	133
Lutjanus apodus	.	1	.	.	.	.	.	.	1	.	.	.	2
Lutjanus cyanopterus	.	.	.	.	.	.	.	1	.	.	.	.	1
Lutjanus griseus	1	11	1	5	7	18	11	43	41	10	1	.	149
Lutjanus synagris	.	.	.	1	3	27	46	72	2	8	2	1	162
Megalops atlanticus	.	.	.	.	.	3	.	.	.	.	.	.	3
Micropogonias undulatus	13	.	4	2	3	6	21	9	7	4	.	63	132

Appendix TQ13-01. (Continued)

Species	**Month**												**Totals**
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=12	**E=12**	**E=12**	**E=12**	**E=12**	**E=12**	**E=12**	**E=12**	**E=12**	**E=12**	**E=12**	**E=12**	**E=144**
Mugil cephalus	62	22	8	36	21	179	95	31	21	74	43	128	720
Mugil curema	392	93	55	72	80	37	73	53	19	54	60	296	1,284
Mycteroperca microlepis	.	.	.	.	.	.	.	1	.	1	2	.	4
Nicholsina usta	.	.	.	.	2	.	.	7	.	.	12	.	21
Ocyurus chrysurus	.	.	.	.	.	.	.	.	.	1	.	.	1
Oligoplites saurus	.	.	8	.	.	.	.	.	.	8	2	4	22
Opisthonema oglinum	.	.	1	.	.	.	.	.	.	.	.	.	1
Opsanus tau	.	1	.	.	1	1	.	2	1	1	.	.	7
Orthopristis chrysoptera	.	10	7	.	.	118	289	212	50	68	20	62	836
Panulirus argus	.	.	.	.	.	2	.	.	.	.	.	.	2
Paralichthys albigutta	.	.	.	1	1	9	2	1	.	.	1	.	15
Paralichthys lethostigma	.	.	.	.	1	.	.	1	.	.	1	.	3
Paralichthys sp.	.	.	.	1	.	.	.	.	.	.	.	.	1
Peprilus paru	.	.	.	.	.	.	1	.	.	.	.	.	1
Pogonias cromis	100	2	25	73	14	11	193	32	61	23	15	27	576
Pomatomus saltatrix	1	.	5	.	2	.	.	.	.	.	.	.	8
Prionotus tribulus	.	.	2	.	1	.	.	.	.	.	.	.	3
Pterois spp.	.	1	.	.	.	1	.	1	.	.	.	.	3
Sarotherodon melanotheron	.	.	.	.	2	.	.	.	.	.	.	.	2
Sciaenops ocellatus	10	6	1	33	.	1	2	.	2	12	12	3	82
Scomberomorus maculatus	.	.	2	1	.	1	.	.	.	1	5	1	11
Scomberomorus regalis	.	.	.	.	.	.	.	1	.	1	.	.	2
Scorpaena brasiliensis	.	.	.	.	.	.	.	.	.	.	2	.	2

Appendix TQ13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=12	E=144
Scorpaena grandicornis	.	1	.	.	.	.	.	.	.	2	1	.	4
Scorpaena plumieri	.	.	.	.	.	.	1	.	1	1	.	.	3
Selene setapinnis	.	.	.	.	.	.	1	.	.	.	.	.	1
Selene vomer	39	12	14	11	14	9	32	.	5	17	16	193	362
Sparisoma chrysopterum	.	.	.	.	.	.	.	.	.	4	1	.	5
Sparisoma radians	.	.	.	.	.	.	.	.	.	4	.	.	4
Sphoeroides nephelus	6	4	4	10	1	2	3	7	19	6	24	8	94
Sphoeroides spengleri	2	.	.	3	1	.	1	1	.	.	4	1	13
Sphoeroides testudineus	3	5	4	1	7	7	11	5	5	2	5	4	59
Sphyraena barracuda	11	30	4	4	4	12	8	8	15	16	22	53	187
Sphyraena guachancho	.	.	1	.	.	.	.	.	.	.	.	.	1
Sphyrna tiburo	.	.	.	.	.	.	.	.	.	1	1	.	2
Stephanolepis hispidus	.	.	.	.	.	.	.	11	.	1	6	.	18
Strongylura marina	.	1	.	.	.	.	.	.	.	.	.	.	1
Strongylura notata	4	11	3	4	.	6	5	1	1	3	7	4	49
Synodus foetens	.	1	1	.	.	1	1	4	1	2	3	1	15
Trachinotus carolinus	.	.	16	.	1	.	3	.	.	.	.	3	23
Trachinotus falcatus	.	.	1	.	1	.	16	1	.	6	8	5	38
Trinectes maculatus	1	.	.	.	.	.	.	.	.	.	.	.	1
Totals	**1,292**	**776**	**1,893**	**962**	**1,037**	**2,052**	**2,130**	**1,823**	**2,151**	**1,435**	**1,094**	**2,072**	**18,717**

Appendix TQ13-02. Summary by gear, stratum and zone of species collected during southern Indian River Lagoon stratified-random sampling, 2013. Sampling with 183-m haul seine was post-stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Zones I and J were located in the Indian River, and Zone T encompassed the lower St. Lucie River. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	**Gear and Strata**		**Zone**			**Totals**
	183-m haul seine					
	Over	**Nonover**	**I**	**J**	**T**	
	E=110	**E=34**	**E=48**	**E=48**	**E=48**	**E=144**
Acanthostracion quadricornis	6	.	.	6	.	6
Achirus lineatus	4	2	2	4	.	6
Aetobatus narinari	.	1	.	.	1	1
Albula vulpes	1	.	1	.	.	1
Anisotremus virginicus	1	.	1	.	.	1
Archosargus probatocephalus	694	175	329	257	283	869
Archosargus rhomboidalis	344	42	190	196	.	386
Archosargus spp.	3	.	3	.	.	3
Ariopsis felis	459	703	410	311	441	1,162
Bagre marinus	1	.	.	1	.	1
Bairdiella chrysoura	42	4	28	18	.	46
Belonidae spp.	3	.	3	.	.	3
Brevoortia spp.	27	20	22	18	7	47
Calamus arctifrons	11	1	2	10	.	12
Calamus bajonado	2	.	.	2	.	2
Callinectes ornatus	11	.	4	1	6	11
Callinectes sapidus	31	6	18	12	7	37
Callinectes similis	1	.	.	1	.	1
Caranx bartholomaei	2	.	.	2	.	2
Caranx crysos	9	.	.	3	6	9
Caranx hippos	163	77	133	61	46	240
Caranx latus	31	4	22	9	4	35
Centropomus undecimalis	365	128	256	174	63	493
Chaetodipterus faber	4	2	1	4	1	6
Charybdis hellerii	1	.	.	1	.	1
Chilomycterus schoepfii	88	24	45	62	5	112

Appendix TQ13-02. (Continued)

Species	Gear and Strata		Zone			Totals
	183-m haul seine					
	Over	Nonover	I	J	T	
	E=110	E=48	E=48	E=48	E=48	E=144
Citharichthys spilopterus	24	2	2	3	21	26
Cynoscion complex	.	3	.	.	3	3
Cynoscion nebulosus	11	4	10	5	.	15
Dasyatis sabina	132	49	50	59	72	181
Dasyatis say	50	9	19	39	1	59
Diapterus auratus	1,995	626	280	1,733	608	2,621
Diodon holocanthus	2	.	.	2	.	2
Diplodus holbrooki	15	.	4	11	.	15
Dorosoma cepedianum	.	1	.	.	1	1
Dorosoma petenense	.	1	.	.	1	1
Echeneis sp.	1	.	.	1	.	1
Elops saurus	1,242	115	300	121	936	1,357
Epinephelus itajara	3	.	2	1	.	3
Eucinostomus gula	564	67	518	90	23	631
Eucinostomus harengulus	218	35	153	33	67	253
Eucinostomus jonesii	2	5	6	.	1	7
Eucinostomus melanopterus	23	2	8	5	12	25
Eugerres plumieri	32	3	1	6	28	35
Gerres cinereus	73	8	15	58	8	81
Gymnura micrura	7	5	5	5	2	12
Haemulon aurolineatum	6	.	4	2	.	6
Haemulon parra	15	.	6	9	.	15
Haemulon plumieri	31	.	4	27	.	31
Haemulon sciurus	12	.	.	12	.	12
Harengula jaguana	86	30	110	6	.	116
Hemiramphus brasiliensis	1	.	1	.	.	1
Hippocampus erectus	2	.	.	2	.	2
Hyporhamphus unifasciatus	1	.	.	1	.	1
Kyphosus saltatrix	11	.	.	11	.	11
Lachnolaimus maximus	35	.	.	35	.	35
Lactophrys trigonus	21	8	4	25	.	29

Appendix TQ13-02. (Continued)

Species	Gear and Strata		Zone			totals
	183-m haul seine					
	Over	Nonover	I	J	T	
	E=110	E=34	E=48	E=48	E=48	E=144
Lagodon rhomboides	4,325	201	2,704	1,815	7	4,526
Leiostomus xanthurus	35	3	16	21	1	38
Lepisosteus osseus	1	1	.	.	2	2
Lobotes surinamensis	.	1	1	.	.	1
Lutjanus analis	112	21	66	64	3	133
Lutjanus apodus	2	.	2	.	.	2
Lutjanus cyanopterus	1	.	.	1	.	1
Lutjanus griseus	131	18	25	106	18	149
Lutjanus synagris	139	23	8	154	.	162
Megalops atlanticus	3	.	.	.	3	3
Micropogonias undulatus	121	11	8	103	21	132
Mugil cephalus	493	227	270	169	281	720
Mugil curema	1,065	219	316	716	252	1,284
Mycteroperca microlepis	4	.	3	1	.	4
Nicholsina usta	21	.	2	19	.	21
Ocyurus chrysurus	1	.	.	1	.	1
Oligoplites saurus	22	.	1	13	8	22
Opisthonema oglinum	1	.	.	1	.	1
Opsanus tau	7	.	1	5	1	7
Orthopristis chrysoptera	823	13	576	260	.	836
Panulirus argus	.	2	.	2	.	2
Paralichthys albigutta	14	1	15	.	.	15
Paralichthys lethostigma	3	.	1	.	2	3
Paralichthys sp.	1	.	1	.	.	1
Peprilus paru	.	1	.	.	1	1
Pogonias cromis	272	304	344	164	68	576
Pomatomus saltatrix	8	.	.	3	5	8
Prionotus tribulus	3	.	2	1	.	3
Pterois spp.	2	1	.	3	.	3
Sarotherodon melanotheron	2	.	2	.	.	2
Sciaenops ocellatus	64	18	70	8	4	82

Appendix TQ13-02. (Continued)

Species	Gear and Strata		Zone			Totals
	183-m haul seine					
	Over	Nonover	I	J	T	
	E=110	E=34	E=48	E=48	E=48	E=144
Scomberomorus maculatus	6	5	3	4	4	11
Scomberomorus regalis	2	.	.	2	.	2
Scorpaena brasiliensis	.	2	2	.	.	2
Scorpaena grandicornis	3	1	1	3	.	4
Scorpaena plumieri	3	.	1	2	.	3
Selene setapinnis	1	.	.	1	.	1
Selene vomer	283	79	109	231	22	362
Sparisoma chrysopterum	5	.	.	5	.	5
Sparisoma radians	4	.	.	4	.	4
Sphoeroides nephelus	79	15	70	24	.	94
Sphoeroides spengleri	13	.	1	12	.	13
Sphoeroides testudineus	41	18	36	13	10	59
Sphyraena barracuda	162	25	112	75	.	187
Sphyraena guachancho	1	.	.	.	1	1
Sphyrna tiburo	2	.	1	1	.	2
Stephanolepis hispidus	18	.	.	18	.	18
Strongylura marina	1	.	1	.	.	1
Strongylura notata	41	8	28	17	4	49
Synodus foetens	14	1	8	7	.	15
Trachinotus carolinus	20	3	7	1	15	23
Trachinotus falcatus	36	2	12	26	.	38
Trinectes maculatus	1	.	.	1	.	1
Totals	**15,331**	**3,386**	**7,798**	**7,532**	**3,387**	**18,717**

Northeast Florida

Northeast Florida encompasses three coastal plain estuaries; each defined by their respective lower river basins (St. Marys River, Nassau River, and St. Johns River) and interconnected via the Intracoastal Waterway (ICW; Figure JX13-01). Shoreline vegetation in the lower St. Marys and Nassau rivers is characterized by an expansive saltmarsh system, while the lower St. Johns River is characterized by marshes, hardwood forests, and hardwood swamps (St. Johns River Water Management District 1993; St. Johns River Water Management District 2000). Bottom substrates are typically characterized as mud, sand, and occasional oysters (Solomon et al. 2006). Bottom vegetation is only present in the oligohaline reaches of the St. Johns River upriver of downtown Jacksonville (Burns et al. 1997).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in northeast Florida since 2001. The area sampled was divided into six geographically-defined riverine zones (A-F; Figure JX13-01). Monthly stratified-random sampling (SRS) was conducted in Zones A-D using 21.3--m river seines, 183-m haul seines, and 6.1-m river otter trawls. Monthly SRS was conducted in Zone E and F with only 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2013 in northeast Florida.

Stratified-Random Sampling

A total of 188,150 animals, which included 148 taxa of fishes and 13 taxa of selected invertebrates, were collected from 1,356 northeast Florida samples in 2013 (Table JX13-01; Appendices JX13-01 and -02). *Anchoa mitchilli* (n=64,961) was the most numerous species collected, representing 34.5% of the total catch. The next two most abundant taxa, *Micropogonias undulatus* (n=22,991) and *Menidia menidia* (n=22,235) accounted for an additional 24.0% of the total catch. Thirty Selected Taxa (n=44,100 animals) composed 23.4% of the total catch. *Micropogonias undulatus* (n=22,991) was the most abundant Selected Taxon, representing 12.2% of the annual catch. *Leiostomus xanthurus* (n=8,911), *Mugil cephalus* (n=3,377), and *Litopenaeus* *setiferus* (n=3,359) were the next three most abundant Selected Taxa, comprising 8.3% of the total catch. Collections in 2013 included two species new to the northeast Florida FIM collection: *Ctenopharyngodon idella* (Grass Carp) and *Pteronotropis metallicus* (Metallic Shiner).

21.3-m River Seines. A total of 120,693 animals were collected in 576 21.3-m river seine samples, representing 64.1% of the overall SRS collections (Table JX13-01). *Anchoa mitchilli* (n=44,803) was the most abundant species, accounting for 37.1% of the 21.3-m river seine catch (Table JX13-02). *Menidia menidia* (n=22,235) and *Menidia* spp. (n=9,301) were the next two most abundant species, accounting for an additional 26.1% of the 21.3-m river seine catch. The taxa most frequently caught in 21.3-m river seines were *Menidia* spp. (41.0% occurrence) and *A. mitchilli* (40.3% occurrence).

A total of 13,538 animals from 26 Selected Taxa were collected, representing 11.2% of the entire 21.3-m river seine catch (Table JX13-03). *Leiostomus xanthurus* (n=7,542), *L. setiferus* (n=1,552), and *M. cephalus* (n=1,526) were the most abundant Selected Taxa, accounting for 78.4% of the Selected Taxa collected by this gear. The Selected Taxon most frequently caught in 21.3-m river seines was *L. xanthurus* (33.5% occurrence).

183-m Haul Seines. A total of 7,777 animals were collected in 192 183-m haul seines, representing 4.1% of the overall SRS catch (Table JX13-01). *Mugil cephalus* (n=1,847) was the most abundant species, accounting for 23.8% of the 183-m haul seine catch (Table JX13-04). *Lagodon rhomboides* (n=816), *Mugil curema* (n=697), *Bairdiella chrysoura* (n=682) and *Chloroscombrus chrysurus* (n=639) were the next most abundant species, accounting for an additional 36.4% of the 183-m haul seine catch. The taxa most frequently caught in the 183-m haul seines were *M. cephalus* (65.6% occurrence) and *L. rhomboides* (41.7% occurrence).

A total of 3,977 animals from 24 Selected Taxa were collected, representing 51.1% of the entire 183-m haul seine catch (Table JX13-05). *Mugil cephalus* (n=1,847), *M. curema* (n=697), and *L. xanthurus* (n=417) were the most abundant Selected Taxa, accounting for 74.5% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 183-m haul seines were *M. cephalus* (65.6% occurrence) and *M. curema* (35.9% occurrence).

6.1-m River Otter Trawl. A total of 59,680 animals were collected in 588 6.1-m river otter trawl samples, representing 31.7% of the overall SRS catch (Table JX13-01). *Micropogonias undulatus* (n=21,976), *A. mitchilli* (n=20,158), and *Stellifer lanceolatus* (n=6,936) were the most abundant species collected, accounting for 82.2% of the 6.1-m river otter trawl catch (Table JX13-06). The taxa most frequently caught in 6.1-m river otter trawls were *M. undulatus* (58.2% occurrence), *A. mitchilli* (49.8% occurrence), and *C. sapidus* (43.0% occurrence).

A total of 26,585 animals from 22 Selected Taxa were collected, representing 44.5% of the entire 6.1-m river otter trawl catch (Table JX13-07). *Micropogonias undulatus* (n=21,976) was the most abundant Selected Taxon, accounting for 82.7% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in the 6.1-m river otter trawls were *M. undulatus* (58.2% occurrence) and *C. sapidus* (43.0% occurrence).

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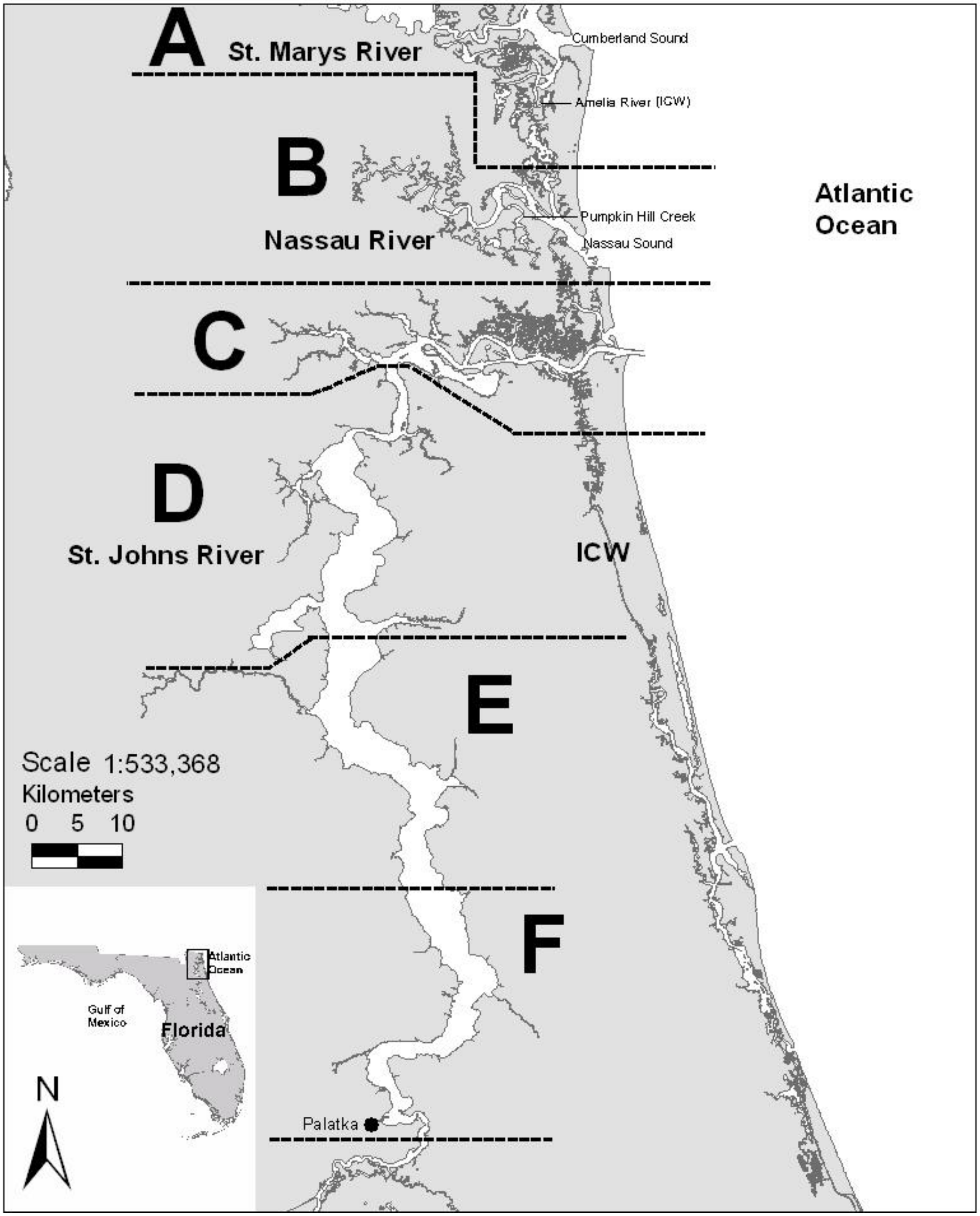

Figure JX13-01. Map of northeast Florida sampling area. Zones are labeled A – F. ICW = Intracoastal Waterway.

Table JX13-01. Summary of catch and effort data for northeast Florida stratified-random sampling, 2013.

Zone	21.3-m river seine		183-m haul seine		6.1-m otter trawl		Totals	
	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls
A	23,969	84	1,630	36	14,178	84	39,777	204
B	19,988	84	1,414	36	4,907	84	26,309	204
C	33,780	108	2,965	60	4,835	108	41,580	276
D	10,821	108	1,768	60	6,748	120	19,337	288
E	11,167	96	.	.	10,329	96	21,496	192
F	20,968	96	.	.	18,683	96	39,651	192
Totals	**120,693**	**576**	**7,777**	**192**	**59,680**	**588**	**188,150**	**1,356**

Table JX13-02. Catch statistics for 10 dominant taxa collected in 576 21.3-m river seine samples during northeast Florida stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	44,803	37.1	40.3	114.39	18.83	395.07	5,402.94	36	0.04	13	80
Menidia menidia	22,235	18.4	31.9	56.77	18.55	784.11	8,935.29	34	0.07	15	92
Menidia spp.	9,301	7.7	41.0	23.75	3.36	339.42	877.94	33	0.08	14	77
Leiostomus xanthurus	7,542	6.3	33.5	19.26	9.31	1,160.94	5,229.41	25	0.17	11	137
Gambusia holbrooki	5,745	4.8	15.1	14.67	4.65	761.30	1,914.71	21	0.05	10	44
Lucania parva	4,102	3.4	23.3	10.47	2.39	548.58	1,035.29	24	0.07	12	49
Anchoa hepsetus	3,039	2.5	15.5	7.76	2.40	741.19	842.65	38	0.19	14	92
Lepomis macrochirus	2,567	2.1	24.8	6.55	1.40	511.12	520.59	42	0.48	20	199
Lagodon rhomboides	2,172	1.8	28.8	5.55	1.66	720.21	832.35	45	0.41	10	151
Litopenaeus setiferus	1,552	1.3	15.8	3.96	1.05	635.52	410.29	10	0.12	1	27
Subtotal	103,058	85.4	.	.	.	.	.	.	.	1	199
Totals	**120,693**	**100.0**	**.**	**308.14**	**29.51**	**229.82**	**9,201.47**	**.**	**.**	**1**	**764**

Table JX13-03. Catch statistics for Selected Taxa collected in 576 21.3-m river seine samples during northeast Florida stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Leiostomus xanthurus	7,542	6.3	33.5	19.26	9.31	1,160.94	5,229.41	25	0.17	11	137
Litopenaeus setiferus	1,552	1.3	15.8	3.96	1.05	635.52	410.29	10	0.12	1	27
Mugil cephalus	1,526	1.3	17.4	3.90	1.37	841.05	680.88	36	0.88	17	348
Micropogonias undulatus	902	0.8	13.7	2.30	0.68	708.42	327.94	34	0.64	9	124
Farfantepenaeus spp.	707	0.6	12.5	1.81	0.87	1,154.57	479.41	10	0.12	3	14
Mugil curema	498	0.4	10.8	1.27	0.60	1,129.67	311.76	46	1.36	18	212
Callinectes sapidus	213	0.2	16.3	0.54	0.08	350.91	26.47	48	2.36	9	182
Trachinotus falcatus	117	0.1	2.4	0.30	0.17	1,332.00	76.47	29	1.21	12	85
Sciaenops ocellatus	93	0.1	9.0	0.24	0.04	400.13	8.82	74	6.54	15	341
Menticirrhus americanus	65	0.1	2.1	0.17	0.11	1,536.94	58.82	31	2.63	13	179
Farfantepenaeus aztecus	52	<0.1	3.5	0.13	0.05	848.39	22.06	17	0.21	15	22
Paralichthys lethostigma	41	<0.1	5.0	0.10	0.02	497.41	5.88	114	15.03	16	437
Cynoscion nebulosus	36	<0.1	2.8	0.09	0.03	848.61	14.71	45	5.07	11	134
Trachinotus carolinus	34	<0.1	1.4	0.09	0.04	1,080.71	16.18	28	3.42	12	75
Paralichthys albigutta	29	<0.1	3.8	0.07	0.02	606.08	7.35	45	4.06	12	118
Cynoscion complex	27	<0.1	0.7	0.07	0.06	2,138.40	35.29	33	1.44	13	44
Elops saurus	18	<0.1	1.9	0.05	0.02	957.10	8.82	65	13.32	32	206

Table JX13-03. (Continued)

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Centropomus undecimalis	17	<0.1	0.7	0.04	0.03	1,551.07	14.71	95	24.70	46	487
Lutjanus griseus	14	<0.1	2.1	0.04	0.01	721.03	2.94	85	16.17	12	175
Paralichthys dentatus	12	<0.1	1.6	0.03	0.01	889.59	4.41	44	4.59	22	83
Menticirrhus saxatilis	9	<0.1	0.9	0.02	0.01	1,218.98	4.41	41	3.12	27	54
Lutjanus synagris	8	<0.1	1.0	0.02	0.01	1,035.31	2.94	60	16.97	30	170
Archosargus probatocephalus	8	<0.1	0.7	0.02	0.01	1,269.96	4.41	166	31.36	64	349
Pogonias cromis	7	<0.1	0.7	0.02	0.01	1,325.26	4.41	154	23.67	85	237
Farfantepenaeus duorarum	5	<0.1	0.9	0.01	0.01	1,069.57	1.47	15	0.20	15	16
Pomatomus saltatrix	5	<0.1	0.9	0.01	0.01	1,069.57	1.47	49	5.78	35	69
Paralichthys squamilentus	1	<0.1	0.2	<0.01	<0.01	2,400.00	1.47	45	.	45	45
Totals	**13,538**	**11.2**	**.**	**34.56**	**9.70**	**673.67**	**5,229.41**	**.**	**.**	**1**	**487**

Table JX13-04. Catch statistics for 10 dominant taxa collected in 192 183-m haul seine samples during northeast Florida stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil cephalus	1,847	23.8	65.6	9.62	1.97	283.28	300.00	192	0.92	68	435
Lagodon rhomboides	816	10.5	41.7	4.25	1.00	325.36	128.00	100	0.83	62	195
Mugil curema	697	9.0	35.9	3.63	1.11	425.53	191.00	147	1.32	62	295
Bairdiella chrysoura	682	8.8	19.8	3.55	1.30	505.96	193.00	127	0.65	76	185
Chloroscombrus chrysurus	639	8.2	9.9	3.33	2.17	901.80	404.00	90	0.47	43	192
Leiostomus xanthurus	417	5.4	26.6	2.17	0.45	287.58	37.00	121	1.42	51	200
Dasyatis sabina	268	3.5	33.9	1.40	0.27	263.30	27.00	212	2.97	118	570
Elops saurus	260	3.3	18.8	1.35	0.63	642.09	114.00	292	3.07	122	462
Eucinostomus harengulus	221	2.8	9.4	1.15	0.58	693.39	99.00	75	0.85	45	118
Diapterus auratus	206	2.7	19.8	1.07	0.31	396.64	38.00	87	1.76	46	183
Subtotal	6,053	77.8	.	.	.	.	.	.	.	43	570
Totals	**7,777**	**100.0**	**.**	**40.51**	**4.17**	**142.57**	**413.00**	**.**	**.**	**9**	**1,072**

Table JX13-05. Catch statistics for Selected Taxa collected in 192 183-m haul seine samples during northeast Florida stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil cephalus	1,847	23.8	65.6	9.62	1.97	283.28	300.00	192	0.92	68	435
Mugil curema	697	9.0	35.9	3.63	1.11	425.53	191.00	147	1.32	62	295
Leiostomus xanthurus	417	5.4	26.6	2.17	0.45	287.58	37.00	121	1.42	51	200
Elops saurus	260	3.3	18.8	1.35	0.63	642.09	114.00	292	3.07	122	462
Micropogonias undulatus	113	1.5	15.1	0.59	0.16	367.29	17.00	148	2.95	86	285
Litopenaeus setiferus	110	1.4	6.3	0.57	0.27	653.45	43.00	20	0.44	10	39
Callinectes sapidus	97	1.3	19.3	0.51	0.13	361.19	20.00	114	3.74	30	192
Cynoscion nebulosus	85	1.1	17.7	0.44	0.10	326.63	11.00	265	6.91	104	435
Paralichthys lethostigma	85	1.1	16.1	0.44	0.11	331.50	11.00	218	9.93	72	453
Sciaenops ocellatus	71	0.9	17.2	0.37	0.08	312.30	8.00	257	15.42	60	571
Archosargus probatocephalus	50	0.6	15.6	0.26	0.06	300.52	7.00	300	12.54	73	475
Pomatomus saltatrix	33	0.4	7.8	0.17	0.07	557.44	12.00	183	8.56	73	315
Menticirrhus americanus	18	0.2	6.3	0.09	0.03	438.73	3.00	197	10.97	30	240
Paralichthys albigutta	17	0.2	4.2	0.09	0.04	563.19	5.00	126	11.02	70	200
Farfantepenaeus aztecus	15	0.2	1.6	0.08	0.06	996.78	10.00	22	1.03	15	28
Lutjanus griseus	13	0.2	5.2	0.07	0.02	479.35	3.00	171	13.73	63	227
Centropomus undecimalis	13	0.2	3.1	0.07	0.03	605.66	3.00	189	26.92	96	446

Table JX13-05. (Continued)

Species	**Number**		**% Occur**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Pogonias cromis	11	0.1	2.6	0.06	0.03	696.01	4.00	217	16.72	152	284
Trachinotus falcatus	10	0.1	2.1	0.05	0.03	728.26	3.00	117	10.91	71	167
Paralichthys dentatus	5	0.1	2.1	0.03	0.01	728.26	2.00	135	20.28	93	212
Trachinotus carolinus	3	<0.1	1.6	0.02	0.01	795.80	1.00	136	63.84	71	264
Farfantepenaeus spp.	3	<0.1	0.5	0.02	0.02	1,385.64	3.00	11	1.45	9	14
Scomberomorus maculatus	2	<0.1	1.0	0.01	0.01	977.23	1.00	273	22.00	251	295
Albula vulpes	1	<0.1	0.5	0.01	0.01	1,385.64	1.00	83	.	83	83
Cynoscion complex	1	<0.1	0.5	0.01	0.01	1,385.64	1.00	241	.	241	241
Totals	**3,977**	**51.1**	**.**	**20.71**	**2.52**	**168.70**	**318.00**	**.**	**.**	**9**	**571**

Table JX13-06. Catch statistics for 10 dominant taxa collected in 588 6.1-m river otter trawl samples during northeast Florida stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Micropogonias undulatus	21,976	36.8	58.2	5.18	0.77	358.83	271.99	34	0.14	7	278
Anchoa mitchilli	20,158	33.8	49.8	4.70	1.00	516.79	306.71	32	0.08	9	94
Stellifer lanceolatus	6,936	11.6	7.3	1.66	1.03	1,493.49	538.72	26	0.19	8	122
Microgobius gulosus	1,901	3.2	20.7	0.44	0.10	549.81	34.10	23	0.15	10	61
Litopenaeus setiferus	1,697	2.8	30.1	0.40	0.07	390.16	21.32	18	0.16	3	38
Trinectes maculatus	1,703	2.9	36.2	0.40	0.07	441.21	27.13	41	0.42	10	125
Leiostomus xanthurus	952	1.6	19.6	0.25	0.09	858.61	45.68	36	1.09	8	155
Callinectes sapidus	673	1.1	43.0	0.16	0.01	186.57	2.81	108	1.87	8	196
Cynoscion complex	366	0.6	16.0	0.09	0.02	440.74	5.25	49	1.87	11	243
Rimapenaeus constrictus	290	0.5	7.3	0.07	0.02	851.98	9.29	6	0.18	2	19
Subtotal	56,652	94.9	.	.	.	.	.	.	.	2	278
Totals	**59,680**	**100.0**	**.**	**14.08**	**1.63**	**280.96**	**541.96**	**.**	**.**	**2**	**1,002**

Table JX13-07. Catch statistics for Selected Taxa collected in 588 6.1-m river otter trawl samples during northeast Florida stratified-random sampling, 2013. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Micropogonias undulatus	21,976	36.8	58.2	5.18	0.77	358.83	271.99	34	0.14	7	278
Litopenaeus setiferus	1,697	2.8	30.1	0.40	0.07	390.16	21.32	18	0.16	3	38
Leiostomus xanthurus	952	1.6	19.6	0.25	0.09	858.61	45.68	36	1.09	8	155
Callinectes sapidus	673	1.1	43.0	0.16	0.01	186.57	2.81	108	1.87	8	196
Cynoscion complex	366	0.6	16.0	0.09	0.02	440.74	5.25	49	1.87	11	243
Farfantepenaeus spp.	277	0.5	11.2	0.07	0.02	585.89	7.95	10	0.17	3	14
Farfantepenaeus aztecus	228	0.4	5.1	0.06	0.04	1,675.22	22.79	19	0.21	15	25
Elops saurus	108	0.2	6.1	0.03	0.01	987.33	6.00	41	0.73	24	100
Menticirrhus americanus	103	0.2	6.1	0.02	0.01	771.78	3.49	38	3.32	14	275
Paralichthys lethostigma	94	0.2	11.6	0.02	<0.01	318.83	0.60	147	8.37	24	452
Sciaenops ocellatus	32	0.1	2.4	0.01	<0.01	939.15	1.35	74	17.46	14	323
Archosargus probatocephalus	16	<0.1	1.9	<0.01	<0.01	927.93	0.67	277	32.10	70	452
Pogonias cromis	15	<0.1	1.0	<0.01	<0.01	1,579.34	1.35	242	26.39	20	346
Farfantepenaeus duorarum	13	<0.1	1.5	<0.01	<0.01	927.52	0.51	19	0.61	15	23
Paralichthys dentatus	10	<0.1	1.5	<0.01	<0.01	859.64	0.34	105	17.18	66	247
Paralichthys albigutta	10	<0.1	1.2	<0.01	<0.01	980.78	0.39	118	13.47	19	179
Mugil cephalus	4	<0.1	0.3	<0.01	<0.01	1,943.59	0.40	232	5.78	221	248

Table JX13-07. (Continued)

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lutjanus griseus	3	<0.1	0.5	<0.01	<0.01	1,405.90	0.17	113	48.04	45	206
Cynoscion nebulosus	2	<0.1	0.3	<0.01	<0.01	1,716.15	0.17	162	51.50	110	213
Albula vulpes	2	<0.1	0.3	<0.01	<0.01	1,723.76	0.17	57	10.50	46	67
Cynoscion nothus	2	<0.1	0.3	<0.01	<0.01	1,723.76	0.17	28	7.50	20	35
Menippe sp.	1	<0.1	0.2	<0.01	<0.01	2,424.87	0.15	35	.	35	35
Pomatomus saltatrix	1	<0.1	0.2	<0.01	<0.01	2,424.87	0.13	121	.	121	121
Totals	**26,585**	**44.5**	**.**	**6.30**	**0.78**	**299.67**	**272.53**	**.**	**.**	**3**	**452**

Appendix JX13-01. Monthly summary of species collected during northeast Florida stratified-random sampling, 2013. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	**Month**												**Totals**
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=113	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=1,356**
Achirus lineatus	.	1	1	1	6	2	2	6	1	3	1	1	25
Aetobatus narinari	.	.	.	.	.	.	.	.	1	.	.	.	1
Albula vulpes	.	.	.	2	.	.	.	.	.	.	.	1	3
Alosa sapidissima	.	.	.	.	.	.	.	.	.	1	.	.	1
Aluterus heudelotii	.	.	.	.	.	1	.	.	.	.	.	.	1
Ameiurus catus	25	29	19	13	20	20	10	37	20	17	17	39	266
Ameiurus nebulosus	1	3	1	.	1	1	.	1	1	.	1	3	13
Amia calva	.	.	.	.	1	.	1	.	.	.	.	.	2
Anchoa hepsetus	47	8	5	14	339	135	2,062	20	433	11	5	32	3,111
Anchoa lyolepis	.	6	.	.	4	31	27	1	151	.	.	.	220
Anchoa mitchilli	2,281	2,643	2,120	6,371	1,931	5,137	8,312	9,825	4,589	8,809	8,886	4,057	64,961
Ancylopsetta quadrocellata	.	1	5	3	5	.	.	.	.	.	.	.	14
Anguilla rostrata	.	.	.	.	.	1	12	.	1	.	1	.	15
Archosargus probatocephalus	6	3	6	2	4	16	7	8	6	3	8	5	74
Ariopsis felis	.	1	.	.	.	.	1	1	2	1	.	.	6
Astroscopus y-graecum	.	1	1	.	2	.	.	1	.	.	2	.	7
Bagre marinus	.	.	.	.	.	.	1	5	.	.	.	.	6
Bairdiella chrysoura	234	41	35	183	250	664	87	41	40	60	54	65	1,754
Bascanichthys bascanium	.	.	1	.	.	.	.	.	.	.	.	.	1
Bathygobius soporator	.	.	.	.	.	.	.	1	.	1	1	5	8
Blenniidae sp.	.	.	.	.	1	.	.	.	.	.	.	.	1

Appendix JX13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
Brevoortia spp.	31	56	629	53	268	97	7	2	6	25	28	5	1,207
Callinectes ornatus	1	.	.	.	.	6	13	3	9	.	1	.	33
Callinectes sapidus	53	56	121	79	123	139	88	72	57	89	64	42	983
Callinectes similis	6	3	5	7	97	44	9	20	1	18	13	.	223
Carangidae sp.	.	.	1	.	.	.	.	.	.	.	.	.	1
Caranx hippos	.	.	.	6	12	12	10	2	3	1	1	1	48
Caranx latus	.	.	.	.	.	.	.	.	.	.	.	5	5
Centropomus undecimalis	.	.	.	.	.	.	2	.	15	1	6	6	30
Centropristis philadelphica	.	.	3	1	14	1	1	1	1	3	.	.	25
Centropristis striata	.	.	.	.	.	.	.	.	.	.	1	.	1
Chaetodipterus faber	.	.	.	4	2	4	6	6	8	4	.	.	34
Charybdis hellerii	.	.	.	.	.	.	.	.	.	1	.	.	1
Chasmodes saburrae	.	.	.	1	.	.	.	.	.	.	.	.	1
Chilomycterus schoepfii	.	.	5	.	.	6	1	3	3	.	.	.	18
Chloroscombrus chrysurus	.	.	.	.	.	4	9	8	169	529	35	1	755
Citharichthys macrops	.	.	.	.	.	1	.	.	.	.	.	.	1
Citharichthys spilopterus	2	4	11	15	72	67	36	41	30	4	2	1	285
Ctenogobius boleosoma	2	9	3	3	.	12	2	3	1	31	2	8	76
Ctenogobius shufeldti	4	1	3	1	.	4	10	4	4	5	24	14	74
Ctenogobius smaragdus	.	.	1	.	1	.	.	5	1	1	2	1	12
Ctenogobius spp.	.	.	.	.	.	2	.	.	.	.	.	.	2
Ctenopharyngodon idella	.	.	.	.	.	.	.	.	.	.	1	.	1

Appendix JX13-01. (Continued)

Species	**Month**												**Totals**
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=113	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=1,356**
Cynoscion complex	8	11	6	.	45	133	30	42	94	14	2	9	394
Cynoscion nebulosus	9	10	7	9	17	13	4	8	21	14	6	5	123
Cynoscion nothus	.	.	.	.	.	.	.	.	1	1	.	.	2
Cyprinodon variegatus	.	.	.	.	.	.	.	.	1	.	.	1	2
Dasyatis sabina	10	29	28	30	71	52	11	49	23	24	15	21	363
Dasyatis say	.	.	.	9	1	7	.	25	6	1	.	.	49
Diapterus auratus	26	12	.	9	15	3	32	62	31	53	103	58	404
Dorosoma cepedianum	9	1	1	1	1	.	8	11	.	5	3	2	42
Dorosoma petenense	1	.	6	1	1	.	.	5	1	13	3	2	33
Elops saurus	28	7	15	88	17	145	8	16	50	6	4	2	386
Enneacanthus gloriosus	.	.	1	.	8	4	14	7	5	.	.	2	41
Erimyzon sucetta	.	.	.	.	17	.	.	.	.	.	.	.	17
Esox niger	1	.	5	.	.	.	2	.	2	.	.	.	10
Etropus crossotus	12	18	18	14	8	9	5	6	14	36	30	13	183
Eucinostomus gula	6	.	4	4	11	14	6	9	6	15	12	38	125
Eucinostomus harengulus	29	9	19	22	31	50	132	100	86	103	219	253	1,053
Eucinostomus spp.	29	9	9	7	4	53	129	102	60	156	173	141	872
Farfantepenaeus aztecus	1	.	1	12	31	237	6	2	2	1	2	.	295
Farfantepenaeus duorarum	.	1	6	2	3	3	2	.	.	.	1	.	18
Farfantepenaeus spp.	1	6	18	108	154	556	8	25	21	57	22	11	987
Fundulus chrysotus	.	.	.	1	.	2	2	2	1	.	.	.	8
Fundulus heteroclitus	664	45	115	14	26	538	6	74	4	4	7	44	1,541

Appendix JX13-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
Fundulus majalis	.	23	3	12	12	8	.	5	.	.	10	3	76
Fundulus seminolis	13	30	31	59	73	30	53	87	45	40	72	9	542
Gambusia holbrooki	1,473	87	67	278	6	20	1	1,350	101	302	438	1,622	5,745
Gobiesox strumosus	.	.	.	.	.	3	.	.	.	.	.	.	3
Gobioides broussonetii	.	1	1	.	1	.	.	.	.	.	.	.	3
Gobiomorus dormitor	.	1	.	.	.	.	.	.	.	.	.	.	1
Gobionellus oceanicus	5	4	2	8	.	.	.	1	3	1	1	.	25
Gobiosoma bosc	2	13	7	9	9	3	4	1	.	3	.	3	54
Gobiosoma robustum	.	2	1	1	.	.	.	.	.	1	2	.	7
Gobiosoma spp.	13	6	10	2	2	3	3	2	33	15	19	13	121
Gymnura micrura	.	.	2	2	21	7	5	19	3	6	1	.	66
Harengula jaguana	.	.	.	.	.	.	.	2	.	.	.	.	2
Heterandria formosa	.	.	25	7	11	3	3	21	26	17	.	10	123
Hippocampus erectus	.	.	2	.	.	.	.	.	.	.	.	.	2
Hypsoblennius hentz	1	.	.	1	.	.	.	.	.	.	.	.	2
Ictalurus punctatus	11	14	11	1	7	1	10	8	8	3	11	5	90
Jordanella floridae	.	.	.	.	.	2	.	.	.	.	.	.	2
Labidesthes sicculus	3	1	1	146	20	.	.	4	8	35	1	19	238
Lagodon rhomboides	40	57	49	194	576	1,099	248	212	98	120	253	81	3,027
Larimus fasciatus	.	.	.	.	.	.	1	2	17	.	7	.	27
Leiostomus xanthurus	259	4,774	647	1,852	687	291	90	114	63	33	77	24	8,911
Lepisosteus osseus	.	3	5	1	1	.	1	3	11	1	4	5	35

Appendix JX13-01. (Continued)

Species	**Month**												**Totals**
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=113	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=1,356**
Lepisosteus platyrhincus	.	5	1	1	2	5	1	2	4	2	.	1	24
Lepomis auritus	20	4	20	23	15	11	12	8	20	2	13	5	153
Lepomis gulosus	.	1	1	.	1	.	.	1	2	1	.	.	7
Lepomis macrochirus	52	78	16	69	81	45	99	73	360	790	537	463	2,663
Lepomis microlophus	4	12	7	11	21	32	16	14	149	171	73	116	626
Lepomis punctatus	1	1	.	.	2	1	6	2	6	3	.	5	27
Lepomis spp.	12	3	.	1	.	71	21	50	411	233	23	63	888
Limulus polyphemus	.	.	.	1	.	.	.	.	2	.	1	2	6
Litopenaeus setiferus	45	53	32	1	55	80	424	813	711	409	567	169	3,359
Lobotes surinamensis	.	.	.	.	1	.	.	.	.	.	.	.	1
Lucania goodei	3	.	1	18	8	192	118	24	118	197	5	730	1,414
Lucania parva	52	124	171	427	311	998	922	173	334	208	334	48	4,102
Lutjanus griseus	.	1	2	1	2	2	3	5	1	7	5	1	30
Lutjanus synagris	.	.	.	.	.	1	1	.	2	4	.	.	8
Membras martinica	1	.	1	1	29	1	10	.	17	10	15	7	92
Menidia menidia	174	318	156	189	7,898	5,452	4,683	865	1,107	393	227	773	22,235
Menidia spp.	1,441	722	475	736	358	465	89	254	874	290	2,763	845	9,312
Menippe sp.	.	1	.	.	.	.	.	.	.	.	.	.	1
Menticirrhus americanus	2	.	2	1	3	59	54	33	17	5	8	2	186
Menticirrhus saxatilis	.	.	.	2	6	1	.	.	.	.	.	.	9
Microgobius gulosus	86	135	54	87	35	41	91	88	212	1,208	272	92	2,401
Microgobius thalassinus	.	1	.	1	.	.	.	1	.	.	.	1	4

Appendix JX13-01. (Continued)

Species	Month												Totals
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=113	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=1,356**
Micropogonias undulatus	3,903	3,236	5,933	3,754	2,673	1,105	259	134	66	23	775	1,130	22,991
Micropterus salmoides	5	5	1	5	160	49	46	16	24	12	5	7	335
Morone saxatilis	.	.	.	.	.	.	.	.	1	.	.	.	1
Mugil cephalus	175	575	1,316	221	192	236	97	66	54	51	297	97	3,377
Mugil curema	20	207	30	102	65	395	27	35	32	76	51	155	1,195
Myrophis punctatus	.	.	.	.	.	.	1	.	.	.	.	.	1
Notemigonus crysoleucas	9	8	.	5	409	151	250	45	70	29	10	36	1,022
Notropis maculatus	.	.	.	.	.	.	.	.	.	4	19	.	23
Ogcocephalus cubifrons	.	1	.	.	.	.	.	.	.	1	.	.	2
Oligoplites saurus	.	.	.	.	.	.	.	2	18	4	4	.	28
Ophidion holbrookii	.	.	3	.	1	.	.	.	.	.	.	.	4
Ophidion marginatum	.	.	.	.	.	.	.	.	.	.	1	.	1
Opisthonema oglinum	.	.	.	2	1	12	20	.	4	12	3	4	58
Opsanus tau	.	8	2	.	10	3	2	7	2	1	.	1	36
Oreochromis spp.	.	.	.	.	.	1	5	2	8	3	1	2	22
Oreochromis/Sarotherodon spp.	.	.	.	.	.	1	14	10	1	.	.	.	26
Orthopristis chrysoptera	.	.	1	138	15	39	8	2	.	.	.	.	203
Paralichthys albigutta	1	2	8	8	25	6	2	1	.	2	.	1	56
Paralichthys dentatus	1	.	5	5	9	4	.	1	.	.	1	1	27
Paralichthys lethostigma	11	14	12	18	45	31	35	14	23	8	5	4	220
Paralichthys squamilentus	.	.	.	1	.	.	.	.	.	.	.	.	1
Peprilus paru	1	3	1	4	12	1	1	.	12	.	.	.	35

Appendix JX13-01. (Continued)

Species	**Month**												**Totals**
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=113	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=1,356**
Poecilia latipinna	65	.	5	4	.	3	1	1	2	42	7	23	153
Pogonias cromis	1	.	2	5	1	8	.	10	4	.	2	.	33
Pomatomus saltatrix	2	.	5	6	3	1	2	.	.	2	.	18	39
Pomoxis nigromaculatus	.	.	1	.	3	.	2	1	2	2	2	.	13
Portunus spp.	4	3	9	1	7	67	3	1	.	3	2	.	100
Prionotus carolinus	1	1	2	.	1	.	.	.	.	.	.	1	6
Prionotus scitulus	1	1	.	.	6	13	2	2	.	1	.	.	26
Prionotus tribulus	16	14	27	14	26	2	1	.	2	3	3	9	117
Pteronotropis metallicus	.	.	.	.	1	.	.	.	.	.	.	.	1
Pterygoplichthys spp.	.	.	.	.	.	.	.	1	1	.	2	.	4
Raja eglanteria	.	.	1	.	.	.	.	.	.	.	.	.	1
Rhinoptera bonasus	.	.	.	.	.	.	.	.	.	1	.	.	1
Rhizoprionodon terraenovae	.	.	.	.	.	.	.	.	.	.	1	.	1
Rimapenaeus constrictus	10	7	6	3	91	93	90	3	20	6	16	31	376
Sciaenops ocellatus	17	27	15	16	12	11	9	11	17	30	20	11	196
Scomberomorus maculatus	.	.	.	1	.	1	.	.	.	.	.	.	2
Scomberomorus sp.	.	.	.	.	.	.	1	.	.	.	.	.	1
Selene setapinnis	.	.	.	.	.	.	.	.	.	4	.	.	4
Selene vomer	.	.	.	.	.	4	.	.	13	3	.	2	22
Sphoeroides nephelus	5	3	3	4	9	6	1	1	1	3	.	1	37
Sphoeroides spengleri	1	.	.	.	.	.	.	.	.	.	.	.	1
Sphyraena borealis	.	.	.	.	1	.	1	.	.	.	.	.	2

Appendix JX13-01. (Continued)

Species	Month												Totals
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=113	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=113**	**E=1,356**
Sphyraena guachancho	.	.	.	.	.	.	1	.	1	.	.	.	2
Sphyrna tiburo	.	.	.	.	.	5	.	1	.	5	.	.	11
Stellifer lanceolatus	.	13	1	3	15	9	4,078	18	119	1,809	848	24	6,937
Stephanolepis hispidus	1	.	.	2	2	.	1	1	.	3	.	.	10
Stomolophus meleagris	3	.	.	1	.	.	.	.	.	1	62	69	136
Strongylura marina	3	1	1	9	2	17	7	11	7	11	3	4	76
Strongylura spp.	.	.	.	1	34	5	11	10	8	5	5	1	80
Symphurus plagiusa	3	2	4	3	17	5	10	3	16	12	28	12	115
Syngnathus louisianae	3	.	2	1	3	5	.	3	1	2	6	1	27
Syngnathus scovelli	6	8	2	3	8	17	6	4	1	1	3	4	63
Synodus foetens	.	1	.	.	6	14	5	3	8	8	6	2	53
Trachinotus carolinus	.	.	.	8	2	17	.	6	4	.	.	.	37
Trachinotus falcatus	.	.	.	.	1	64	.	10	38	12	2	.	127
Trichiurus lepturus	.	.	.	.	.	.	.	.	.	1	.	.	1
Trinectes maculatus	151	232	69	29	324	117	248	133	93	66	191	103	1,756
Tylosurus crocodilus	.	.	.	.	.	.	.	.	.	.	1	.	1
Urophycis spp.	2	.	.	.	.	.	.	.	.	.	.	.	2
Xiphopenaeus kroyeri	.	.	.	.	.	.	1	.	.	.	10	1	12
Totals	**11,661**	**13,871**	**12,505**	**15,610**	**18,060**	**19,671**	**23,338**	**15,468**	**11,418**	**16,893**	**17,889**	**11,766**	**188,150**

Appendix JX13-02. Summary by gear, stratum, and zone of species collected during northeast Florida stratified-random sampling, 2013. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

Species	**Gear and Strata**			**Zone**						**Totals**
	21.3-m river seine	**183-m haul seine**	**6.1-m otter trawl**	**A**	**B**	**C**	**D**	**E**	**F**	
	E=576	**E=192**	**E=588**	**E=204**	**E=204**	**E=276**	**E=288**	**E=192**	**E=192**	**E=1,356**
Achirus lineatus	5	6	14	3	7	11	4	.	.	25
Aetobatus narinari	.	1	.	1	.	.	.	.	.	1
Albula vulpes	.	1	2	1	1	1	.	.	.	3
Alosa sapidissima	1	.	.	.	.	.	.	.	1	1
Aluterus heudelotii	.	.	1	.	1	.	.	.	.	1
Ameiurus catus	7	12	247	31	4	7	48	84	92	266
Ameiurus nebulosus	2	.	11	.	.	.	1	6	6	13
Amia calva	2	.	.	.	.	.	.	1	1	2
Anchoa hepsetus	3,039	9	63	987	1,273	821	29	.	1	3,111
Anchoa lyolepis	220	.	.	6	1	213	.	.	.	220
Anchoa mitchilli	44,803	.	20,158	21,487	13,005	12,860	3,700	3,549	10,360	64,961
Ancylopsetta quadrocellata	.	4	10	8	.	6	.	.	.	14
Anguilla rostrata	14	.	1	.	1	.	1	9	4	15
Archosargus probatocephalus	8	50	16	6	14	39	15	.	.	74
Ariopsis felis	.	.	6	.	1	2	2	.	1	6
Astroscopus y-graecum	1	3	3	4	1	2	.	.	.	7
Bagre marinus	3	1	2	.	4	2	.	.	.	6
Bairdiella chrysoura	891	682	181	450	570	509	189	34	2	1,754
Bascanichthys bascanium	.	.	1	.	.	1	.	.	.	1
Bathygobius soporator	8	.	.	.	1	7	.	.	.	8
Blenniidae sp.	.	.	1	.	.	1	.	.	.	1
Brevoortia spp.	996	195	16	109	276	207	15	25	575	1,207
Callinectes ornatus	7	1	25	16	15	2	.	.	.	33
Callinectes sapidus	213	97	673	128	147	181	197	162	168	983
Callinectes similis	66	20	137	79	70	71	3	.	.	223
Carangidae sp.	1	.	.	1	.	.	.	.	.	1
Caranx hippos	13	35	.	6	10	20	12	.	.	48
Caranx latus	.	5	.	.	.	5	.	.	.	5
Centropomus undecimalis	17	13	.	.	.	9	21	.	.	30
Centropristis philadelphica	7	.	18	14	9	2	.	.	.	25

Appendix JX13-02. (Continued)

Species	Gear and Strata			Zone						Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	D	E	F	
	E=576	E=192	E=588	E=204	E=204	E=276	E=288	E=192	E=192	E=1,356
Centropristis striata	.	.	1	.	1	.	.	.	.	1
Chaetodipterus faber	1	7	26	8	19	7	.	.	.	34
Charybdis hellerii	1	.	.	.	1	.	.	.	.	1
Chasmodes saburrae	1	.	.	.	1	.	.	.	.	1
Chilomycterus schoepfii	9	1	8	8	6	4	.	.	.	18
Chloroscombrus chrysurus	51	639	65	107	81	565	2	.	.	755
Citharichthys macrops	1	.	.	.	.	1	.	.	.	1
Citharichthys spilopterus	115	24	146	44	65	48	54	31	43	285
Ctenogobius boleosoma	73	.	3	9	21	29	16	1	.	76
Ctenogobius shufeldti	49	.	25	13	1	7	26	18	9	74
Ctenogobius smaragdus	10	.	2	5	1	4	2	.	.	12
Ctenogobius spp.	2	.	.	1	.	1	.	.	.	2
Ctenopharyngodon idella	.	1	.	.	.	.	1	.	.	1
Cynoscion complex	27	1	366	79	81	42	128	52	12	394
Cynoscion nebulosus	36	85	2	36	50	26	10	1	.	123
Cynoscion nothus	.	.	2	1	.	.	1	.	.	2
Cyprinodon variegatus	2	.	.	.	.	1	.	.	1	2
Dasyatis sabina	19	268	76	107	137	75	21	4	19	363
Dasyatis say	1	47	1	34	10	5	.	.	.	49
Diapterus auratus	123	206	75	13	34	138	208	3	8	404
Dorosoma cepedianum	4	35	3	1	.	1	36	.	4	42
Dorosoma petenense	20	4	9	2	3	.	3	.	25	33
Elops saurus	18	260	108	61	37	81	172	14	21	386
Enneacanthus gloriosus	41	.	.	.	.	.	.	22	19	41
Erimyzon sucetta	17	.	.	.	.	.	.	17	.	17
Esox niger	10	.	.	.	.	.	.	9	1	10
Etropus crossotus	26	39	118	74	74	31	3	.	1	183
Eucinostomus gula	71	44	10	20	8	96	1	.	.	125
Eucinostomus harengulus	759	221	73	47	95	487	254	115	55	1,053
Eucinostomus spp.	833	.	39	47	52	374	322	68	9	872
Farfantepenaeus aztecus	52	15	228	41	208	18	27	1	.	295
Farfantepenaeus duorarum	5	.	13	4	4	9	1	.	.	18

Appendix JX13-02. (Continued)

Species	Gear and Strata			Zone						Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	D	E	F	
	E=576	E=192	E=588	E=204	E=204	E=276	E=288	E=192	E=192	E=1,356
Farfantepenaeus spp.	707	3	277	69	541	209	154	14	.	987
Fundulus chrysotus	8	.	.	.	.	.	.	2	6	8
Fundulus heteroclitus	1,540	.	1	779	421	339	2	.	.	1,541
Fundulus majalis	76	.	.	35	13	28	.	.	.	76
Fundulus seminolis	541	.	1	.	.	.	93	157	292	542
Gambusia holbrooki	5,745	.	.	6	12	8	21	2,123	3,575	5,745
Gobiesox strumosus	3	.	.	3	.	.	.	.	.	3
Gobioides broussonetii	.	.	3	.	.	.	2	1	.	3
Gobiomorus dormitor	1	.	.	.	.	.	.	.	1	1
Gobionellus oceanicus	11	.	14	.	.	3	13	8	1	25
Gobiosoma bosc	46	.	8	3	3	8	13	15	12	54
Gobiosoma robustum	6	.	1	.	.	2	1	2	2	7
Gobiosoma spp.	97	.	24	1	.	6	22	24	68	121
Gymnura micrura	.	47	19	41	21	4	.	.	.	66
Harengula jaguana	1	1	.	1	.	1	.	.	.	2
Heterandria formosa	123	.	.	.	.	.	.	80	43	123
Hippocampus erectus	.	.	2	1	1	.	.	.	.	2
Hypsoblennius hentz	1	.	1	.	.	2	.	.	.	2
Ictalurus punctatus	.	3	87	.	.	.	6	38	46	90
Jordanella floridae	2	.	.	.	.	.	.	.	2	2
Labidesthes sicculus	238	.	.	.	.	.	32	15	191	238
Lagodon rhomboides	2,172	816	39	88	79	851	1,612	385	12	3,027
Larimus fasciatus	.	.	27	24	2	1	.	.	.	27
Leiostomus xanthurus	7,542	417	952	668	524	5,557	1,702	421	39	8,911
Lepisosteus osseus	4	24	7	12	3	1	12	3	4	35
Lepisosteus platyrhincus	7	17	.	.	.	.	18	4	2	24
Lepomis auritus	133	15	5	.	.	.	39	24	90	153
Lepomis gulosus	6	.	1	.	.	.	2	4	1	7
Lepomis macrochirus	2,567	63	33	1	.	.	223	677	1,762	2,663
Lepomis microlophus	579	27	20	.	.	.	54	342	230	626
Lepomis punctatus	27	.	.	.	.	.	.	16	11	27
Lepomis spp.	888	.	.	.	.	.	38	355	495	888

Appendix JX13-02. (Continued)

Species	Gear and Strata			Zone						Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	D	E	F	
	E=576	E=192	E=588	E=204	E=204	E=276	E=288	E=192	E=192	E=1,356
Limulus polyphemus	.	3	3	5	1	.	.	.	.	6
Litopenaeus setiferus	1,552	110	1,697	579	545	698	965	269	303	3,359
Lobotes surinamensis	.	1	.	.	1	.	.	.	.	1
Lucania goodei	1,414	.	.	.	.	.	2	305	1,107	1,414
Lucania parva	4,102	.	.	.	.	.	291	2,111	1,700	4,102
Lutjanus griseus	14	13	3	10	4	8	7	.	1	30
Lutjanus synagris	8	.	.	1	4	3	.	.	.	8
Membras martinica	92	.	.	26	32	1	31	.	2	92
Menidia menidia	22,235	.	.	4,197	3,817	14,017	168	11	25	22,235
Menidia spp.	9,301	.	11	69	75	33	1,404	2,888	4,843	9,312
Menippe sp.	.	.	1	.	.	1	.	.	.	1
Menticirrhus americanus	65	18	103	71	74	38	3	.	.	186
Menticirrhus saxatilis	9	.	.	6	1	1	1	.	.	9
Microgobius gulosus	500	.	1,901	.	.	.	261	586	1,554	2,401
Microgobius thalassinus	.	.	4	2	.	.	2	.	.	4
Micropogonias undulatus	902	113	21,976	1,051	1,829	329	4,407	5,040	10,335	22,991
Micropterus salmoides	319	15	1	.	1	.	40	170	124	335
Morone saxatilis	1	.	.	1	.	.	.	.	.	1
Mugil cephalus	1,526	1,847	4	395	580	996	1,313	74	19	3,377
Mugil curema	498	697	.	79	269	709	132	2	4	1,195
Myrophis punctatus	.	.	1	.	.	.	.	.	1	1
Notemigonus crysoleucas	1,018	4	.	.	.	.	7	150	865	1,022
Notropis maculatus	23	.	.	.	.	.	4	.	19	23
Ogcocephalus cubifrons	.	1	1	.	.	2	.	.	.	2
Oligoplites saurus	28	.	.	8	6	13	1	.	.	28
Ophidion holbrookii	.	.	4	.	4	.	.	.	.	4
Ophidion marginatum	.	.	1	1	.	.	.	.	.	1
Opisthonema oglinum	34	23	1	22	19	17	.	.	.	58
Opsanus tau	1	5	30	8	3	20	5	.	.	36
Oreochromis spp.	17	5	.	.	.	.	7	7	8	22
Oreochromis/Sarotherodon spp.	26	.	.	.	.	.	.	9	17	26
Orthopristis chrysoptera	195	.	8	1	23	173	6	.	.	203

Appendix JX13-02. (Continued)

Species	Gear and Strata			Zone						Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	D	E	F	
	E=576	E=192	E=588	E=204	E=204	E=276	E=288	E=192	E=192	E=1,356
Paralichthys albigutta	29	17	10	18	17	18	3	.	.	56
Paralichthys dentatus	12	5	10	11	10	6	.	.	.	27
Paralichthys lethostigma	41	85	94	38	21	48	55	25	33	220
Paralichthys squamilentus	1	.	.	.	.	1	.	.	.	1
Peprilus paru	1	26	8	25	7	3	.	.	.	35
Poecilia latipinna	153	.	.	3	9	1	4	23	113	153
Pogonias cromis	7	11	15	7	5	3	17	1	.	33
Pomatomus saltatrix	5	33	1	11	19	9	.	.	.	39
Pomoxis nigromaculatus	7	1	5	.	.	.	5	1	7	13
Portunus spp.	52	6	42	90	8	2	.	.	.	100
Prionotus carolinus	2	.	4	2	3	1	.	.	.	6
Prionotus scitulus	12	.	14	18	3	5	.	.	.	26
Prionotus tribulus	14	4	99	31	59	21	6	.	.	117
Pteronotropis metallicus	1	.	.	.	.	.	.	.	1	1
Pterygoplichthys spp.	3	.	1	.	.	.	1	.	3	4
Raja eglanteria	.	.	1	.	1	.	.	.	.	1
Rhinoptera bonasus	.	1	.	1	.	.	.	.	.	1
Rhizoprionodon terraenovae	.	1	.	.	1	.	.	.	.	1
Rimapenaeus constrictus	86	.	290	129	236	11	.	.	.	376
Sciaenops ocellatus	93	71	32	9	11	30	95	17	34	196
Scomberomorus maculatus	.	2	.	.	.	2	.	.	.	2
Scomberomorus sp.	1	.	.	.	.	.	1	.	.	1
Selene setapinnis	.	.	4	4	.	.	.	.	.	4
Selene vomer	2	16	4	14	3	4	1	.	.	22
Sphoeroides nephelus	8	19	10	5	4	27	1	.	.	37
Sphoeroides spengleri	.	1	.	.	.	1	.	.	.	1
Sphyraena borealis	2	.	.	.	.	2	.	.	.	2
Sphyraena guachancho	1	.	1	1	.	1	.	.	.	2
Sphyrna tiburo	.	11	.	2	9	.	.	.	.	11
Stellifer lanceolatus	1	.	6,936	6,528	300	12	97	.	.	6,937
Stephanolepis hispidus	5	.	5	5	3	2	.	.	.	10
Stomolophus meleagris	7	92	37	7	1	128	.	.	.	136

Appendix JX13-02. (Continued)

Species	Gear and Strata			Zone						Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	A	B	C	D	E	F	
	E=576	E=192	E=588	E=204	E=204	E=276	E=288	E=192	E=192	E=1,356
Strongylura marina	47	29	.	8	7	17	10	13	21	76
Strongylura spp.	80	.	.	1	1	14	12	27	25	80
Symphurus plagiusa	63	.	52	29	64	6	16	.	.	115
Syngnathus louisianae	13	.	14	9	13	4	1	.	.	27
Syngnathus scovelli	58	.	5	.	5	3	26	11	18	63
Synodus foetens	39	3	11	19	14	17	3	.	.	53
Trachinotus carolinus	34	3	.	25	6	6	.	.	.	37
Trachinotus falcatus	117	10	.	5	19	49	54	.	.	127
Trichiurus lepturus	.	.	1	.	.	1	.	.	.	1
Trinectes maculatus	44	9	1,703	346	141	15	288	820	146	1,756
Tylosurus crocodilus	.	1	.	.	.	1	.	.	.	1
Urophycis spp.	.	.	2	2	.	.	.	.	.	2
Xiphopenaeus kroyeri	.	.	12	11	.	1	.	.	.	12
Totals	**120,693**	**7,777**	**59,680**	**39,777**	**26,309**	**41,580**	**19,337**	**21,496**	**39,651**	**188,150**

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Fish Health Monitoring

Introduction

Long-term multi-gear and multi-habitat sampling programs, such as the Fisheries-Independent Monitoring (FIM) program, not only provide fish population information to fisheries managers, but also help to document changes and evaluate the effects of natural and anthropogenic disturbances to ecosystems (Wolfe et al. 1987). Increased urban development in coastal areas has made adjacent aquatic ecosystems (estuaries, bays, and tidal rivers) some of the most intensively fertilized environments on earth (Cloern et al. 1995). The influx of nutrients and other materials commonly associated with urban development and industry has led to concerns about the concomitant eutrophication and degradation of water quality in Florida's coastal systems. Evidence of a correlation between environmental degradation and the occurrence of certain fish diseases continues to accumulate (Sinderman 1979). The incidence of gross external abnormalities (GEAs) in marine species, defined as those illnesses or deformations easily observed in the field, provides valuable information on the level of environmental stress placed upon species in estuarine and coastal waters (Fournie et al. 1996). Baseline information on the frequency of occurrence of GEAs is necessary to identify changes in the ecological health of Florida's estuaries.

The Fish and Wildlife Research Institute's (FWRI) FIM program began to document visually observed GEAs (including parasites) on fish and select invertebrates in Florida's estuaries in April 1998. The main objectives of the fish health monitoring component of the FIM program are to categorize prominent types of GEAs observed, document which species are most susceptible, and document normal background levels of fish health problems. This report summarizes the occurrence of GEAs observed on larger fish (≥ 75 mm SL) and selected invertebrates collected during routine stratified-random sampling (SRS) in select Florida estuaries in 2013.

Methods

Fish health monitoring was conducted in all Florida estuarine areas sampled by the FIM program. All fish (≥ 75 mm SL) and selected invertebrates were visually examined for GEAs. Abnormalities that were opportunistically observed on specimens < 75 mm SL were also recorded; however, they are not presented in this report. Specimens with external abnormalities were assigned a “Health Code” in the field by FIM staff, packed on ice and returned to the lab. These specimens were sent to the FWRI’s Fish and Wildlife Health (FWH) group in St. Petersburg, Florida for detailed diagnosis. Specimens collected from estuaries outside the Tampa Bay region were either fixed in 10% formalin or shipped on ice to the FWH group. After evaluating each specimen, the FWH group assigned a health code to each specimen and provided these data to the FIM program for input into a database. Health codes assigned by fish pathologists in the FWH group took priority over those assigned in the field. For specimens that were assigned a health code and released in the field (i.e., fish with scoliosis or gill isopods) the health codes were not changed. Nine health codes were used:

B	Red or bloody areas (no scale loss)
E	Erosion or scale loss (only epidermis or dermis involved, muscle tissue not affected)
F	Fin rot (inflamed or frayed fins)
S	Skeletal abnormalities (vertebral, opercular, or fin deformities)
T	Tumor, cyst (raised area)
U	Ulcer or lesion (muscle tissue affected)
P	Parasitic infestation
D	Dead prior to collection
O	Other (i.e., emaciated fish, healing wound, eye discoloration, missing parts, and mechanical damage)

Results and Discussion

Of the 231,830 fish (≥ 75 mm SL) and selected invertebrates that were collected during 2013 FIM SRS, 2,108 (48 taxa, 0.9%) were observed to have a GEA (Table FH13-01). The northern Indian River Lagoon had the highest incidence of GEAs (3.9%), followed by northeast Florida (0.4%) and Tampa Bay (0.1%). Apalachicola Bay, Cedar Key, Charlotte Harbor, and the southern Indian River Lagoon all had very low incidence of GEAs (all <0.1%). Statewide, all nine types of GEAs were observed. The most often identified GEAs were parasitic infestation (n=1,767), followed by bloody areas (n=164; Table FH13-02). Five taxa of recreational or commercial importance (i.e., Selected Taxa) were among the top 10 taxa observed with a GEA (Table FH13-02). *Mugil curema and Mugil cephalus* were the most common species collected with a GEA. The majority (96.8%) of the affected *M. curema* and *M. cephalus* collected had parasitic infestation. Selected invertebrates that were collected with a GEA during routine monitoring in 2013 included one *Callinectes sapidus* in Cedar Key with a parasitic infestation and one *C. sapidus* in Tampa Bay that was dead prior to collection.

Incidence by Lab

Apalachicola Bay: Apalachicola Bay staff examined 25,333 specimens for GEAs. Twenty-two individuals (<0.1%) from 12 taxa, seven of which were Selected Taxa, had a GEA (Table FH12-03). Parasitic infestation (n=6) was the most common GEA observed and occurred on five taxa.

Cedar Key: Cedar Key staff examined 19,597 specimens and two individuals were found to have a GEA (Table FH13-04). One individual was a Selected Taxon (*C. sapidus*) and had a parasitic infestation. Cedar Key had the lowest occurrence of GEAs (<0.1%).

Charlotte Harbor: Charlotte Harbor staff examined 36,153 specimens for GEAs. Seventeen individuals from 12 taxa, three of which were Selected Taxa, had a GEA (Table FH13-05). Dead prior to collection (n=6) was the most common GEA observed and occurred on six taxa.

Northern Indian River Lagoon: Northern Indian River Lagoon staff examined 49,707 specimens for GEAs. One thousand nine hundred thirty-seven individuals

(3.9%) from 19 taxa, five of which were Selected Taxa, had a GEA (Table FH13-06). Northern Indian River Lagoon had the highest occurrence of GEAs (3.9%). Fish collected in the northern Indian River Lagoon and observed with either parasitic infestation or bloody areas accounted for 97.8% of the affected specimens within that system. Parasitic infestation was primarily observed on *M. cephalus* (n=894) and *M. curema* (n=840), while bloody areas were primarily observed on *Ariopsis felis* (n=137).

Northeast Florida: Northeast Florida staff examined 12,299 specimens for GEAs. Forty-six individuals (0.4%) from 16 taxa, eight of which were Selected Taxa, had a GEA (Table FH13-07). Fish collected in northeast Florida and observed with ulcers/lesions accounted for 73.9% of affected specimens within that system. Ulcers/lesions were observed on 10 of the taxa, with the majority occurring in *Brevoortia* spp. (n=15) and *M. cephalus* (n=8).

Tampa Bay: Tampa Bay staff examined 71,160 specimens for GEAs. Seventy-three individuals (0.1%) from 20 taxa, nine of which were Selected Taxa, had a GEA (Table FH13-08). Other (n=23), parasitic infestation (n=14), and skeletal abnormalities (n=13) comprised 68.5% of the GEAs observed in Tampa Bay. *Stongylura notata* was the most common taxon with a GEA of other (n=19).

Southern Indian River Lagoon: Southern Indian River Lagoon staff examined 17,581 specimens for GEAs. Eleven individuals (<0.1%) from four taxa, three of which were Selected Taxa, had a GEA (Table FH13-09). Bloody fins (n=3), fin rot (n=3), ulcers/lesions (n=3), and other (n=2) were the only GEAs observed in the southern Indian River Lagoon during routine monitoring in 2013.

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Table FH13-01. Incidence of external abnormalities in fish and selected invertebrates collected during stratified-random sampling at each FIM field lab during 2013. Data are based only on fish ≥ 75 mm SL and include total number collected, number affected by abnormalities, and percentage affected by abnormalities.

Field Laboratory	**Number Collected**	**Number Affected**	**Percent Affected**
Apalachicola Bay	25,333	22	<0.10
Cedar Key	19,597	2	<0.10
Charlotte Harbor	36,153	17	<0.10
N. Indian River Lagoon	49,707	1,937	3.90
Northeast Florida	12,299	46	0.37
Tampa Bay	71,160	73	0.10
S. Indian River Lagoon	17,581	11	<0.10
Totals	**231,830**	**2,108**	**0.91**

Table FH13-02. Top 10 taxa having gross external abnormalities, sorted by Percent Affected, collected from all estuaries sampled by the Fisheries-Independent Monitoring program during stratified-random sampling, 2013. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = (number affected / number collected) ∗ 100.

Scientific Name	Number Collected (≥ 75-mm SL)	Number Affected (≥ 75-mm SL)	Health Code P	B	F	U	E	S	T	O	D	Percent Affected
Mugil curema	8,369	863	840	2	15	2	.	2	.	2	.	10.31
Mugil cephalus	10,131	930	895	10	10	11	2	.	.	2	.	9.18
Ariopsis felis	3,610	147	2	143	.	1	.	.	.	1	.	4.07
Brevoortia spp.	905	19	2	.	.	15	1	.	1	.	.	2.10
Strongylura notata	1,875	27	.	.	.	.	.	7	1	19	.	1.44
Sciaenops ocellatus	1,584	8	4	2	.	.	.	1	.	1	.	0.51
Centropomus undecimalis	2,713	11	.	.	.	7	.	2	.	2	.	0.41
Archosargus probatocephalus	4,199	14	2	.	1	2	.	6	.	2	1	0.33
Dasyatis sabina	2,942	8	5	1	.	.	.	.	.	1	1	0.27
Lagodon rhomboides	56,450	15	2	.	1	4	4	2	.	1	1	<0.10
Subtotal (top 10 taxa with GEAs)	**92,778**	**2,042**	**1,752**	**158**	**27**	**42**	**7**	**20**	**2**	**31**	**3**	**2.20**
Totals (all taxa)	**231,830**	**2,108**	**1,767**	**164**	**38**	**57**	**8**	**25**	**4**	**37**	**8**	**0.91**

P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D = dead. **Bold species are Selected Taxa**.

Table FH13-03. List of taxa, sorted by Percent Affected, having gross external abnormalities collected in Apalachicola Bay during stratified-random sampling, 2013. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = (number affected / number collected) ∗ 100.

Scientific Name	Number Collected (≥ 75-mm SL)	Number Affected (≥ 75-mm SL)	Health Code P	B	F	U	E	S	T	O	D	Percent Affected
Menticirrhus littoralis	33	1	.	.	1	.	.	.	.	.	.	3.03
Chaetodipterus faber	51	1	.	1	.	.	.	.	.	.	.	1.96
Gymnura micrura	68	1	1	.	.	.	.	.	.	.	.	1.47
Archosargus probatocephalus	164	2	.	.	.	.	.	1	.	1	.	1.22
Ariopsis felis	455	3	2	.	.	1	.	.	.	.	.	0.66
Paralichthys albigutta	174	1	.	.	.	.	.	1	.	.	.	0.57
Pogonias cromis	347	1	.	.	.	1	.	.	.	.	.	0.29
Mugil cephalus	2,072	5	1	.	1	.	2	.	.	1	.	0.24
Sciaenops ocellatus	642	1	1	.	.	.	.	.	.	.	.	0.16
Leiostomus xanthurus	1,515	2	.	.	2	.	.	.	.	.	.	0.13
Bairdiella chrysoura	3,806	2	1	.	.	1	.	.	.	.	.	<0.10
Lagodon rhomboides	8,097	2	.	.	.	1	1	.	.	.	.	<0.10
Totals (all taxa)	**25,333**	**22**	**6**	**1**	**4**	**4**	**3**	**2**	**.**	**2**	**.**	**<0.10**

P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D = dead. **Bold species are Selected Taxa**.

Table FH13-04. List of taxa, sorted by Percent Affected, having gross external abnormalities collected in Cedar Key during stratified-random sampling, 2013. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = (number affected / number collected) ∗ 100.

Scientific Name	Number Collected (≥ 75-mm SL)	Number Affected (≥ 75-mm SL)	Health Code P	B	F	U	E	S	T	O	D	Percent Affected
Callinectes sapidus	103	1	1	.	.	.	.	.	.	.	.	0.97
Dasyatis sabina	1,566	1	.	.	.	.	.	.	.	1	.	<0.10
Totals (all taxa)	**19,597**	**2**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**<0.10**

P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D = dead. **Bold species are Selected Taxa**.

Table FH13-05. List of taxa, sorted by Percent Affected, having gross external abnormalities collected in Charlotte Harbor during stratified-random sampling, 2013. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = (number affected / number collected) ∗ 100.

Scientific Name	Number Collected (≥ 75-mm SL)	Number Affected (≥ 75-mm SL)	Health Code P	B	F	U	E	S	T	O	D	Percent Affected
Opisthonema oglinum	18	1	.	.	.	.	.	.	.	.	1	5.56
Bagre marinus	52	2	.	.	.	.	.	.	.	2	.	3.85
Oligoplites saurus	31	1	.	.	.	1	.	.	.	.	.	3.23
Cynoscion arenarius	123	1	.	.	.	.	.	.	.	.	1	0.81
Chilomycterus schoepfii	550	2	.	.	1	1	.	.	.	.	.	0.36
Prionotus scitulus	310	1	.	.	.	.	.	.	1	.	.	0.32
Centropomus undecimalis	739	2	.	.	.	1	.	1	.	.	.	0.27
Harengula jaguana	533	1	.	.	1	.	.	.	.	.	.	0.19
Archosargus probatocephalus	648	1	.	.	.	.	.	.	.	.	1	0.15
Eucinostomus gula	1,573	1	.	.	.	.	.	.	.	.	1	<0.10
Orthopristis chrysoptera	2,474	1	.	.	.	.	.	.	.	.	1	<0.10
Lagodon rhomboides	17,220	3	.	.	.	.	.	1	.	1	1	<0.10
Totals (all taxa)	**36,153**	**17**	**.**	**.**	**2**	**3**	**.**	**2**	**1**	**3**	**6**	**<0.10**

P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D = dead. **Bold species are Selected Taxa**.

Table FH13-06. List of taxa, sorted by Percent Affected, having gross external abnormalities collected in the northern Indian River Lagoon during stratified-random sampling, 2013. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = (number affected / number collected) ∗ 100.

Scientific Name	Number Collected (≥ 75-mm SL)	Number Affected (≥ 75-mm SL)	Health Code									Percent Affected
			P	B	F	U	E	S	T	O	D	
Fundulus grandis	6	2	.	1	.	.	.	.	1	.	.	33.33
Sphyrna tiburo	3	1	.	.	.	.	.	.	.	1	.	33.33
Mugil cephalus	4,452	907	894	5	8	.	.	.	.	.	.	20.37
Mugil curema	6,913	857	840	2	12	1	.	2	.	.	.	12.40
Ariopsis felis	1,549	138	.	137	.	.	.	.	.	1	.	8.91
Hyporhamphus meeki	39	1	1	.	.	.	.	.	.	.	.	2.56
Eugerres plumieri	40	1	.	.	.	.	.	1	.	.	.	2.50
Sciaenops ocellatus	480	5	3	2	.	.	.	.	.	.	.	1.04
Cynoscion nebulosus	98	1	.	.	1	.	.	.	.	.	.	1.02
Oligoplites saurus	129	1	.	1	.	.	.	.	.	.	.	0.78
Chilomycterus schoepfii	132	1	.	.	.	.	.	.	.	1	.	0.76
Orthopristis chrysoptera	622	3	1	.	2	.	.	.	.	.	.	0.48
Sphoeroides nephelus	689	3	1	1	.	.	.	.	.	1	.	0.44
Strongylura notata	462	2	.	.	.	.	.	1	1	.	.	0.43
Archosargus probatocephalus	2,420	8	2	.	1	2	.	3	.	.	.	0.33
Caranx hippos	765	2	1	.	.	.	.	1	.	.	.	0.26
Dasyatis sabina	808	2	2	.	.	.	.	.	.	.	.	0.25
Brevoortia spp.	584	1	.	.	.	.	.	.	1	.	.	0.17
Lagodon rhomboides	4,335	1	.	.	1	.	.	.	.	.	.	<0.10
Totals (all taxa)	**49,707**	**1,937**	**1,745**	**149**	**25**	**3**	**.**	**8**	**3**	**4**	**.**	**3.90**

P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D = dead. **Bold species are Selected Taxa**.

Table FH13-07. List of taxa, sorted by Percent Affected, having gross external abnormalities collected in northeast Florida during stratified-random sampling, 2013. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = (number affected / number collected) ∗ 100.

	Number Collected	Number Affected	Health Code									Percent Affected
Scientific Name	**(≥ 75-mm SL)**	**(≥ 75-mm SL)**	**P**	**B**	**F**	**U**	**E**	**S**	**T**	**O**	**D**	
Brevoortia spp.	217	16	.	.	.	15	1	.	.	.	.	7.37
Achirus lineatus	19	1	.	1	.	.	.	.	.	.	.	5.26
Pogonias cromis	32	1	.	.	.	1	.	.	.	.	.	3.13
Pomatomus saltatrix	33	1	.	.	.	.	1	.	.	.	.	3.03
Dorosoma cepedianum	40	1	.	.	.	1	.	.	.	.	.	2.50
Ictalurus punctatus	57	1	.	1	.	.	.	.	.	.	.	1.75
Paralichthys lethostigma	186	2	.	.	.	2	.	.	.	.	.	1.08
Sciaenops ocellatus	102	1	.	.	.	.	.	.	.	1	.	0.98
Lagodon rhomboides	906	6	.	.	.	3	3	.	.	.	.	0.66
Mugil cephalus	1,924	10	.	1	.	8	.	.	.	1	.	0.52
Ameiurus catus	214	1	.	.	.	1	.	.	.	.	.	0.47
Elops saurus	270	1	.	.	.	1	.	.	.	.	.	0.37
Lepomis macrochirus	356	1	.	.	.	1	.	.	.	.	.	0.28
Leiostomus xanthurus	641	1	1	.	.	.	.	.	.	.	.	0.16
Bairdiella chrysoura	870	1	.	.	.	1	.	.	.	.	.	0.11
Micropogonias undulatus	1,302	1	.	.	1	.	.	.	.	.	.	<0.10
Totals (all taxa)	**12,299**	**46**	**1**	**3**	**1**	**34**	**5**	**.**	**.**	**2**	**.**	**0.37**

P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D = dead. **Bold species are Selected Taxa**.

Table FH13-08. List of taxa, sorted by Percent Affected, having gross external abnormalities collected in Tampa Bay during stratified-random sampling, 2013. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = (number affected / number collected) ∗ 100.

Scientific Name	Number Collected (≥ 75-mm SL)	Number Affected (≥ 75-mm SL)	Health Code P	B	F	U	E	S	T	O	D	Percent Affected
Lepisosteus osseus	18	6	6	.	.	.	.	.	.	.	.	33.33
Brevoortia spp.	104	2	2	.	.	.	.	.	.	.	.	1.92
Strongylura notata	1,413	25	.	.	.	.	.	6	.	19	.	1.77
Calamus arctifrons	65	1	.	.	1	.	.	.	.	.	.	1.54
Mugil curema	192	2	.	.	1	1	.	.	.	.	.	1.04
Dasyatis sabina	568	5	3	1	.	.	.	.	.	.	1	0.88
Strongylura marina	133	1	.	.	.	.	.	1	.	.	.	0.75
Mugil trichodon	167	1	.	.	1	.	.	.	.	.	.	0.60
Centropomus undecimalis	1,481	8	.	.	.	5	.	1	.	2	.	0.54
Sphoeroides nephelus	218	1	.	.	.	1	.	.	.	.	.	0.46
Ariopsis felis	1,606	6	.	6	.	.	.	.	.	.	.	0.37
Mugil cephalus	948	3	.	1	.	2	.	.	.	.	.	0.32
Archosargus probatocephalus	967	3	.	.	.	.	.	2	.	1	.	0.31
Sciaenops ocellatus	360	1	.	.	.	.	.	1	.	.	.	0.28
Callinectes sapidus	751	1	.	.	.	.	.	.	.	.	1	0.13
Leiostomus xanthurus	987	1	.	.	.	1	.	.	.	.	.	0.10
Elops saurus	2,560	1	.	.	.	.	.	1	.	.	.	<0.10
Eucinostomus gula	3,547	1	1	.	.	.	.	.	.	.	.	<0.10
Eucinostomus harengulus	2,973	1	.	.	.	.	.	.	.	1	.	<0.10
Lagodon rhomboides	25,892	3	2	.	.	.	.	1	.	.	.	<0.10
Totals (all taxa)	**71,160**	**73**	**14**	**8**	**3**	**10**	**.**	**13**	**.**	**23**	**2**	**0.10**

P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D = dead. **Bold species are Selected Taxa**.

Table FH13-09. List of taxa, sorted by Percent Affected, having gross external abnormalities collected in southern Indian River Lagoon during stratified-random sampling, 2013. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = (number affected / number collected) ∗ 100.

Scientific Name	Number Collected (≥ 75-mm SL)	Number Affected (≥ 75-mm SL)	Health Code									Percent Affected
			P	**B**	**F**	**U**	**E**	**S**	**T**	**O**	**D**	
Mugil cephalus	735	5	.	3	1	1	.	.	.	.	.	0.68
Eucinostomus harengulus	244	1	.	.	.	1	.	.	.	.	.	0.41
Mugil curema	1,264	4	.	.	2	.	.	.	.	2	.	0.32
Centropomus undecimalis	493	1	.	.	.	1	.	.	.	.	.	0.20
Totals (all taxa)	**17,581**	**11**	**.**	**3**	**3**	**3**	**.**	**.**	**.**	**2**	**.**	**<0.10**

P = parasitic infestation; B = red or bloody areas; F = fin rot; U = ulcer or lesion; E = erosion or scale loss; S = skeletal abnormalities; T = tumor/cysts; O = other; D = dead. **Bold species are Selected Taxa**.

Species Profiles

Introduction

An important use of Fisheries-Independent Monitoring (FIM) program data is to track relative abundance of fish stocks and provide information for species management plans, including information on the abundance of juvenile fish. Juvenile indices of abundance (IOAs) measure the relative abundance of newly-recruited or young-of-the-year (YOY) fish and may be used to describe recruitment processes and forecast population trends. Adult IOAs measure the relative abundance of larger, older fish and may be used to describe the sexually mature portion of a population and also help forecast future population trends. When combined, these two pieces of information can provide a comprehensive picture of the relative condition of a fish population. This section provides profiles of species that are routinely collected in FIM program sampling and are of recreational or commercial importance in Florida (e.g., Red Drum, Spotted Seatrout, Sheepshead, Striped Mullet, Pinfish, Common Snook, and Blue Crab).

Similar analyses were used to develop recruitment indices for each species examined. Data from stratified-random sampling (SRS) were used to create IOAs for YOY and adults of target species. Starting in 2013, only monthly SRS data (1996 to present) were used for IOAs as opposed to previous reporting years that included seasonal sampling (1989-1995). Study areas (i.e., estuarine systems) included in the analyses were selected based upon adequate sample sizes of the target species or years of available data, and separate IOAs were calculated for each study area. The specific time periods and sizes of specimens included in the analyses varied among species based upon their individual patterns of recruitment and growth. Length-frequency histograms were examined to determine the time period and size at which the target species fully recruited to the sampling gears. In general, only months of peak abundance were included in the analyses. Larger sizes of fish were omitted from the YOY analyses because they were considered to be sub-adult or adult. Such fish were analyzed separately from YOYs for select species.

The IOAs representing either annual recruitment (YOY IOAs) or the sexually mature portion of the population (Adult IOAs) were computed using generalized linear models to reduce spatial and temporal variability between sets. The FIM program's SRS design generates count data, the distribution of which is bounded by zero. Often, the frequency distribution of these counts is highly non-normal. Therefore, a Poisson or negative binomial distribution was used to create IOAs instead of log-transformed counts as in years prior to 2009. Location, time, and environmental variables were treated as either classification variables (zone, year, month, gear, deployment technique, shore type, sediment type, and presence / absence of bottom vegetation) or covariates (water temperature, salinity, and depth) in the analyses. The GLIMMIX procedure (SAS Institute Inc. 2006) was used to complete all analyses. In order to normalize the data, water temperature, salinity, and depth were natural log transformed [ln (X+1)] prior to analysis. With the exception of year, all variables that were not significant ($P>0.05$) and did not improve the fit of the model were dropped and the analysis was repeated.

Relative abundance was calculated as the median annual number of fish per set. Median values were determined from the least-squares adjusted means by multiplying the standard error by a random normal deviate ($\mu=0$, $\sigma=1$) and adding it to the least-squares mean. These data were then back-transformed (e^x). The process was repeated 500 times for each year to create a sampling distribution of back-transformed values and summary statistics (25 and 75 percentiles) were then calculated and plotted to view annual trends in IOAs (Sokal and Rohlf 1981).

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Red Drum, *Sciaenops ocellatus*

The Red Drum, *Sciaenops ocellatus*, is an estuarine-dependent species inhabiting coastal waters from Massachusetts to northern Mexico (Yokel 1966; Reagan 1985). This species supports important recreational fisheries throughout the U.S. south Atlantic and Gulf of Mexico coasts. In Florida, dramatic stock reductions in the mid 1980s resulted in a 1986 moratorium on commercial and recreational Red Drum fisheries. In 1989, the fishery was reopened with strict size and bag limits, as well as a no-sale provision that effectively eliminated the commercial Red Drum fishery in Florida. Since that time, Red Drum stocks have shown signs of recovery, and in 1994 abundances were equal to or slightly greater than those observed in the early to mid 1980s (Muller and Murphy 1994). Although fishing mortality estimates have steadily increased since the early 1990s, the most recent model predictions for age-specific indices of Red Drum indicated that populations in Florida exceeded the Florida Fish and Wildlife Conservation Commission's management target of at least a 30% escapement rate on both coasts (Murphy and Munyandorero 2009). In addition, continued improvement of escapement rates within the northeast and northwest management regions of the state led to an increase of the daily bag limit from one to two fish in early 2012 and a renewed interest in opening up coastal Red Drum to harvest in the Gulf. However, bag limits within the southern management areas of the state have remained at one fish per person per day.

In Florida, adult Red Drum spawn from mid-August through late November (Yokel 1966). Spawning occurs primarily near bay mouths, inlets, or over nearshore continental shelf waters (Mercer 1984; Murphy and Taylor 1990), and in some locations inside estuaries (Murphy and Taylor 1990; Johnson and Funicelli 1991). In Florida estuaries, recruitment of juveniles begins in September and continues through February, with peaks occurring in October and November (Reagan 1985; Peters and McMichael 1987; Daniel 1988). Settlement of young-of-the-year (YOY) Red Drum typically occurs in the middle to upper reaches of estuaries, away from ocean inlets or passes, and can be strongly influenced by the availability of low to moderate salinity habitats (FDEP-FMRI 1997). On both coasts, large juvenile Red Drum enter the fishery at approximately 15 – 18 months of age, and are fully recruited at the beginning of their third year (age-2) (FWC-FMRI 2004). The legal recreational slot limit (457-686 mm total length [TL]; 18-27 inch TL) includes predominantly age-1 and age-2 fish. Red drum greater than 700 mm standard length (SL) are uncommon in the FIM program samples from west Florida estuaries, but are occasionally collected on the east coast in the Indian River Lagoon (IRL) (FWC-FMRI 2004).

In an effort to monitor year-class strength and to improve the ability to predict future adult Red Drum abundances, the FIM program developed indices of relative abundance (IOAs) of YOY recruitment into selected Florida estuaries. Abundance indices were calculated separately for bay and river habitats in each estuary. Abundance data for YOY Red Drum ≤ 40 mm SL that were collected in stratified-random 21.3-m seine samples were examined to assess recruitment into six Florida estuaries: (in order of sampling inception): Tampa Bay, Charlotte Harbor, northern IRL, Cedar Key, Apalachicola Bay, and northeast Florida. Young-of-the-year Red Drum recruited to habitats sampled with our 21.3-m seines primarily from September – December, although in some bays the onset of recruitment was delayed until October (Tampa Bay and Apalachicola), and extended into January (Charlotte Harbor and Cedar Key) or February (northern IRL). Therefore, these bay-specific months were used to define the respective recruitment seasons for each estuary in subsequent analyses. Indices of abundance for YOY Red Drum were not calculated for the southern IRL (21.3-m seines were not included as a sampling gear), for bay habitats in northeast Florida (only river habitats were sampled), or for river habitats in Charlotte Harbor and Apalachicola Bay (insufficient sample sizes). Annual IOAs were also developed for legal-size Red Drum that fall within the permitted recreational harvest size range (457-686 mm TL; 374-565 mm SL; Murphy and Taylor 1990) in each estuary, including the southern IRL. These IOAs included all legal-size Red Drum collected in stratified-random 183-m haul seines during each calendar year (January – December).

Annual IOAs for YOY Red Drum showed similar recruitment patterns in Tampa Bay and Charlotte Harbor (Figure SP13-01). Annual IOAs for YOY Red Drum in Tampa Bay indicated that recruitment was strong during 2002 and 2003 in riverine and bay habitats, but otherwise relatively stable over the time series. Annual IOAs for legal-size fish in Tampa Bay have been relatively stable since 1996 with the highest abundance occurring in 2013. The IOAs for YOY Red Drum in Charlotte Harbor riverine habitats have been relatively low, but stable since 1996 with peaks of abundances in 2002, 2003, and 2010. In Charlotte Harbor bay habitats, annual IOAs for YOY Red Drum have been relatively stable since 1996 with a strong year class evident in 2013. In Charlotte Harbor, abundance of legal-size fish has varied little and without trend since 1996.

Indices of abundance for YOY Red Drum varied without trend on Florida's northwest coast (Figure SP13-01). The IOAs for YOY Red Drum in Apalachicola Bay indicated one strong year class in 2002; otherwise recruitment was relatively low, but stable. The IOAs for legal-size Red Drum in Apalachicola Bay indicated a general increase in abundance over time with peaks in 2001, 2003, 2007, and 2013. Young-of-the-year IOAs in Cedar Key river habitats indicated relatively strong year classes in 1996 and 1997; otherwise, YOY Red Drum IOAs remained fairly low and stable. In Cedar Key bay habitats, YOY IOAs indicated the presence of a relatively strong year class in 2003 and 2013. The IOAs for legal-size Red Drum in Cedar Key show one peak in abundance in 1998 with a steady decline through 2002; after which, abundances have remained consistently low through 2013. The similarity in the patterns of YOY abundance observed over the past 20 years in Florida's Gulf of Mexico estuarine systems suggests that YOY Red Drum recruitment along Florida's west coast may be influenced by factors which operate over regional scales.

Red drum IOAs varied substantially between estuaries on Florida's Atlantic coast (Figure SP13-01). Indices of abundance for YOY Red Drum in northeast Florida estuaries varied without trend from 2001 through 2013 with stronger year classes in 2003, 2006, and 2012. Annual IOAs for legal-size Red Drum in northeast Florida indicated peaks in abundance in 2004-2006 and 2009-2010. In the northern IRL, strong year classes were observed for YOY Red Drum in 2003, 2004, 2008, and 2013 in river habitats; otherwise, recruitment was relatively low, but stable. In northern IRL bay habitats, increases in YOY Red Drum IOAs were observed during 1999, 2002-2004, 2008-2009, and 2012. All other years had low but stable recruitment. Annual IOAs for legal-size Red Drum in the northern IRL have generally increased from 1997 to 2013. In the southern IRL, legal-size Red Drum abundances have been stable with peaks in abundance in 1997 and 2009.

Length-frequency data collected with 183-m haul seines provides valuable information on larger juvenile and adult Red Drum (Figure SP13-02). In most estuaries, the length-frequency distributions were tri-modal with one cohort between ~100-200 mm SL, a second cohort from ~300-400 mm SL, and a third from ~450-600 mm SL. The 183-m haul seines were able to capture large YOY (100-200 mm SL), age-1 (300-400 mm SL), and age-2-3 (450-600 mm SL) Red Drum. In Tampa Bay, Charlotte Harbor, and the northern IRL, the length-frequency distributions showed abundances of individuals within the legal slot-limit were roughly equivalent to the abundance of individuals approaching the minimum slot-limit length. In contrast, in Apalachicola Bay, Cedar Key, northeast Florida, and the southern IRL, the abundances of Red Drum within the legal slot-limit dropped off sharply from the abundances of individuals available just prior to attaining the legal harvestable size range. This disparity could have been a result of differential behavior of the fish (i.e., these fish leave the estuary system at smaller sizes in Apalachicola Bay, Cedar Key, northeast Florida, and southern IRL), as a result of angler behavior (i.e., more catch-and-release activities in Tampa Bay, Charlotte Harbor and the northern IRL), or recent changes in bag limits in the northeast and northwest. Legal-size Red Drum were likely age-1 and age-2 individuals, and the length-frequency distributions dropped off sharply after the upper slot limit. This may have been due to the fact that older Red Drum (age-4 and older), once sexually mature, typically leave the estuaries and move to coastal areas to join schools of other reproductively mature individuals and become unavailable to routine FIM sampling gears.

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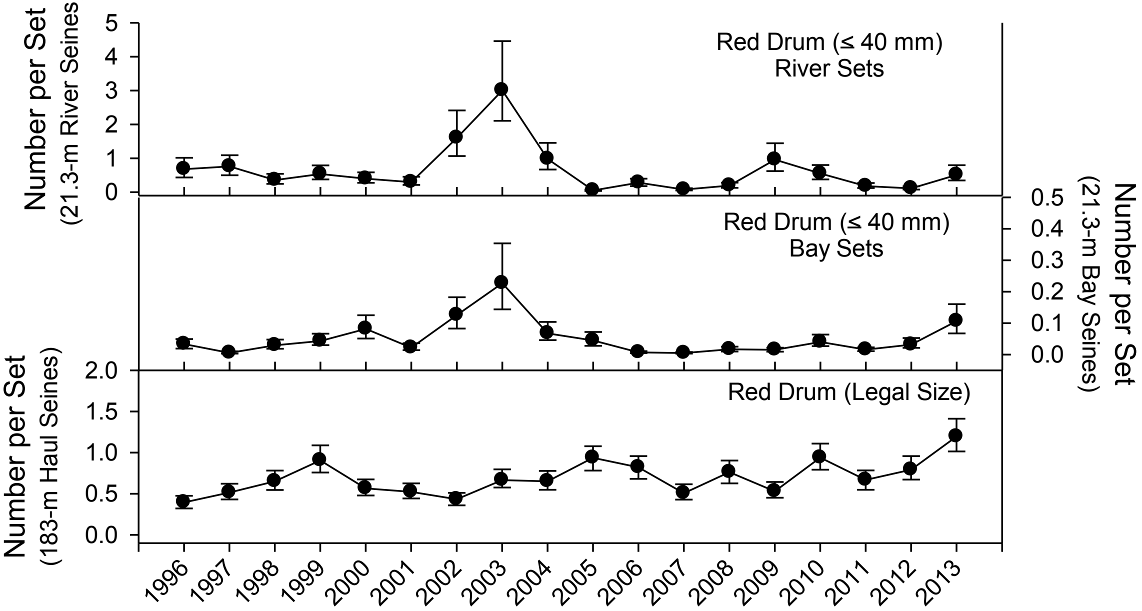
Tampa Bay



Charlotte Harbor

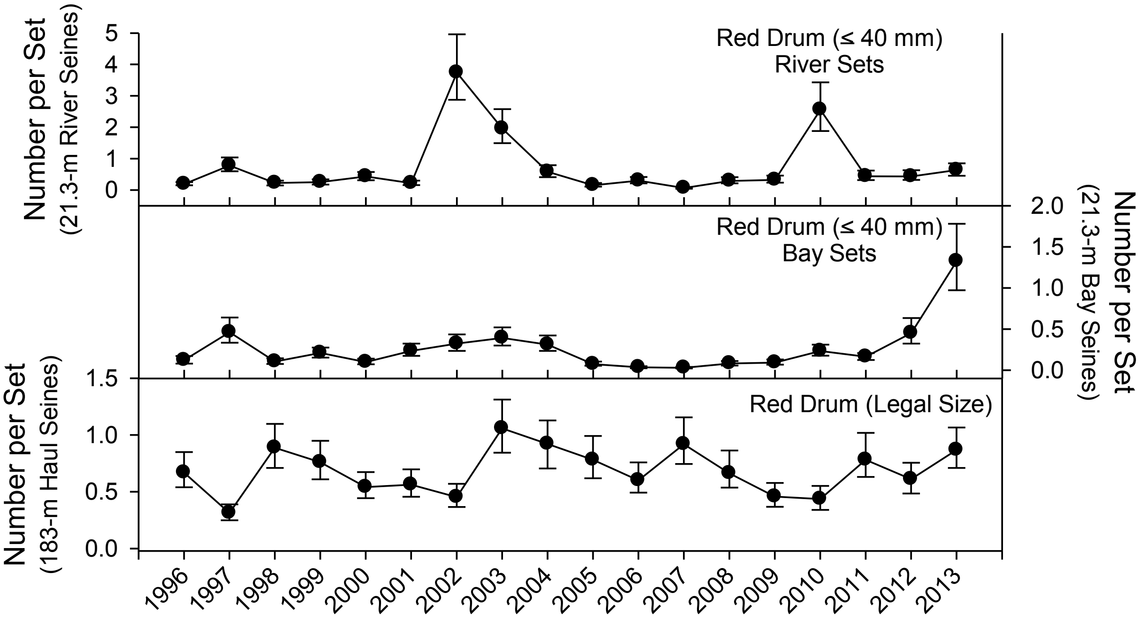
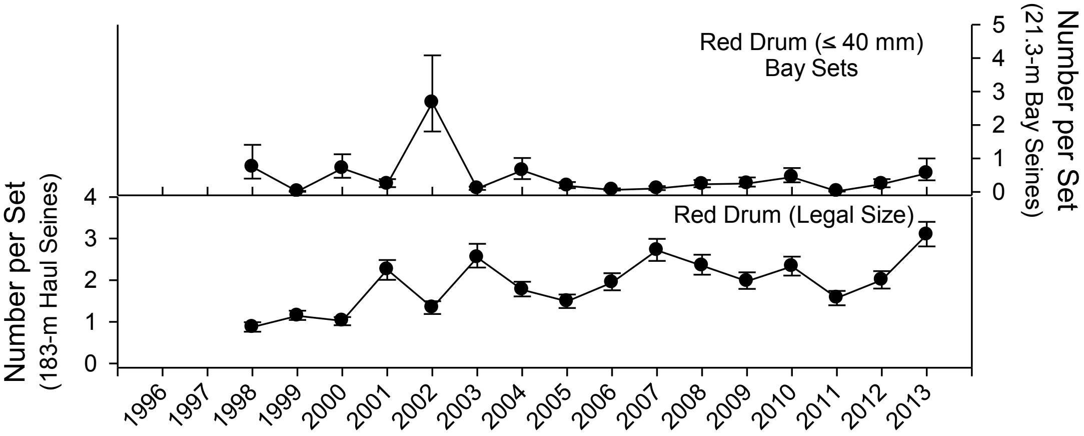


Figure SP13-01. Relative abundance of young-of-the-year Red Drum (≤ 40 mm SL) collected in 21.3-m seines and of legal-size Red Drum (374-565 mm SL) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems. In some instances, where sufficient numbers of individuals were captured, separate plots for river and bay sets were created to examine differences in YOY recruitment between the two habitats. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gears and estuaries.

Apalachicola Bay



Cedar Key

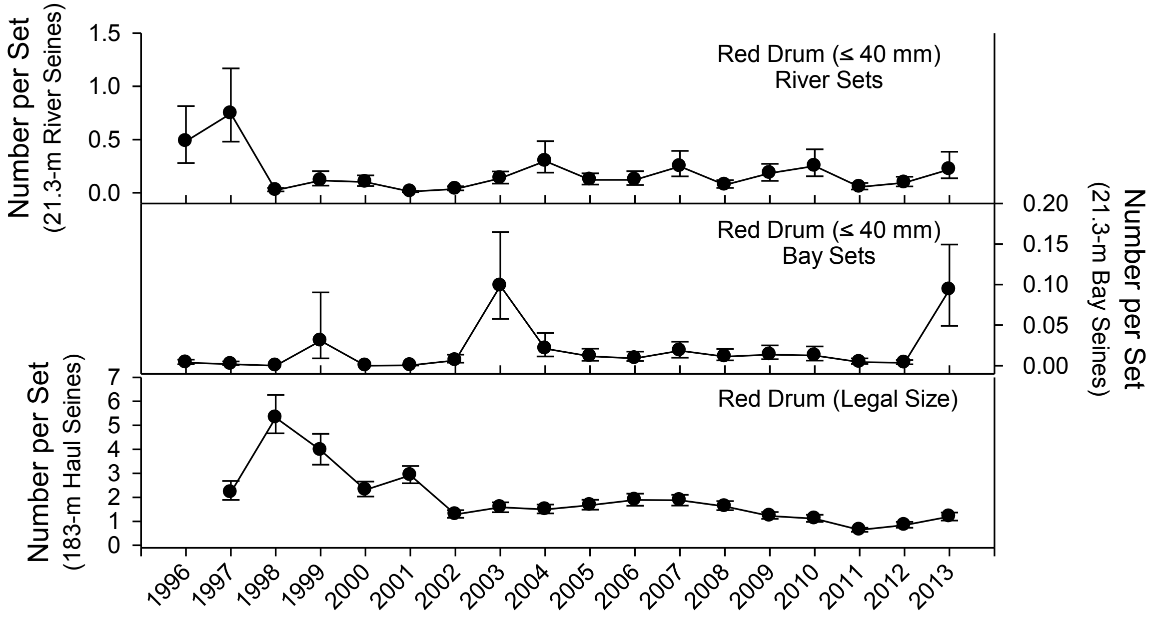
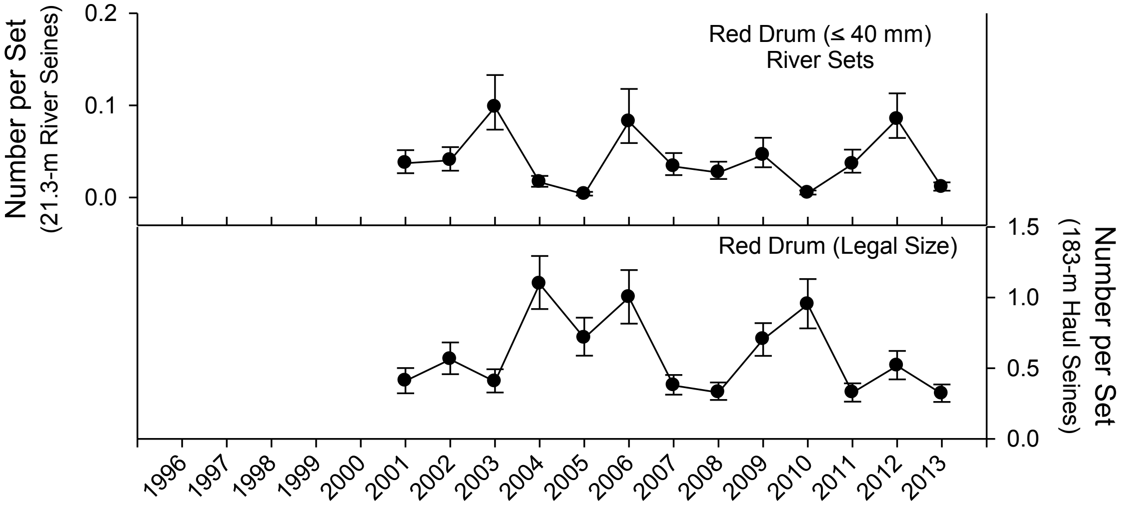


Figure SP13-01. (Continued) Relative abundance of young-of-the-year Red Drum (≤ 40 mm SL) collected in 21.3-m seines and of legal-size Red Drum (374-565 mm SL) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems.

Northeast Florida



Indian River Lagoon

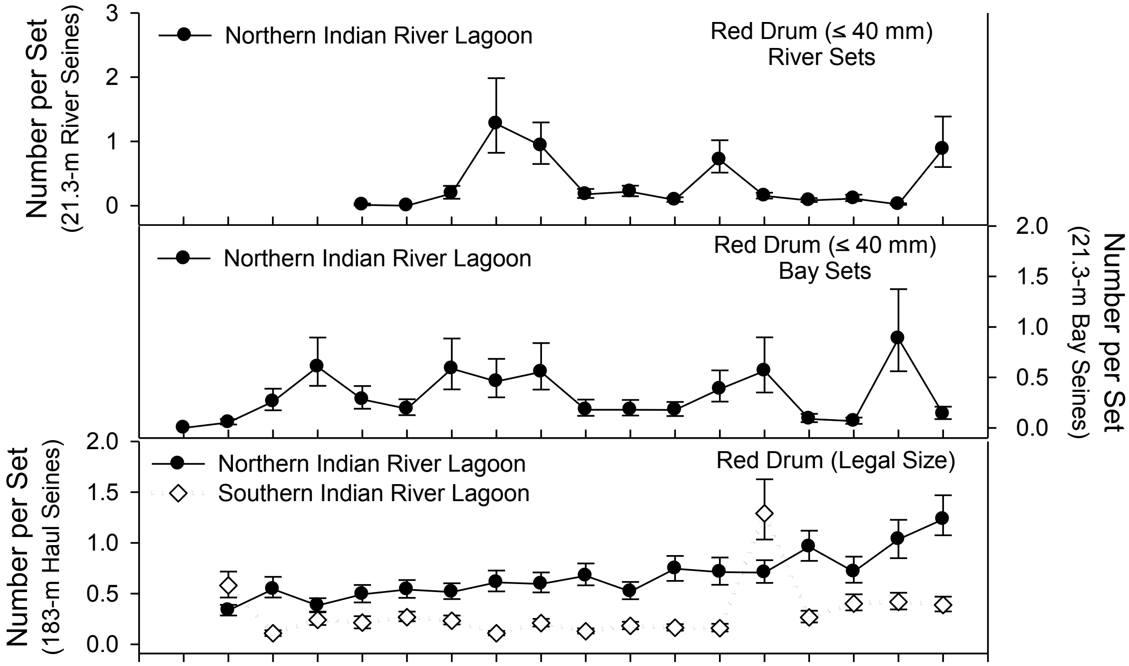
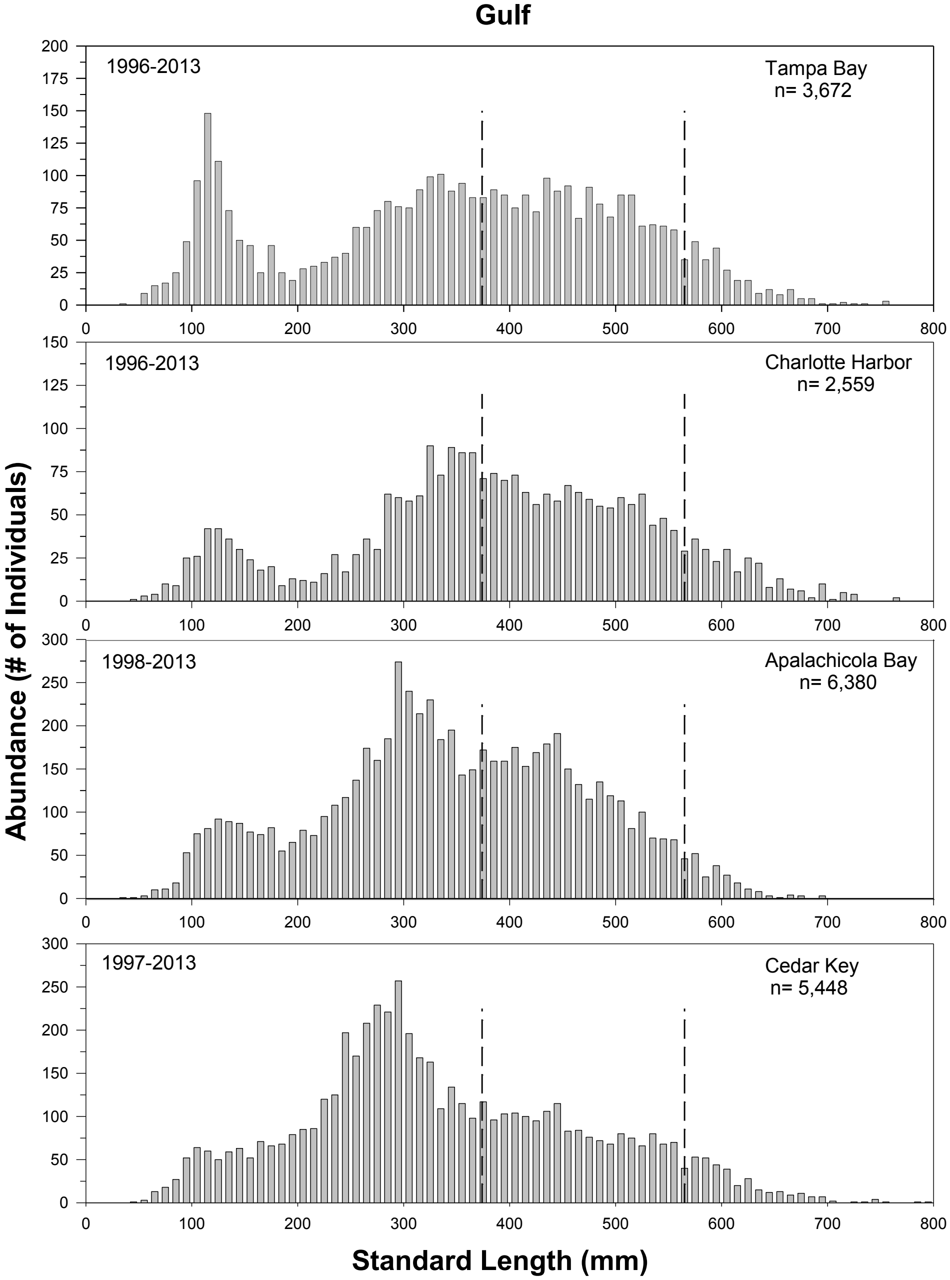
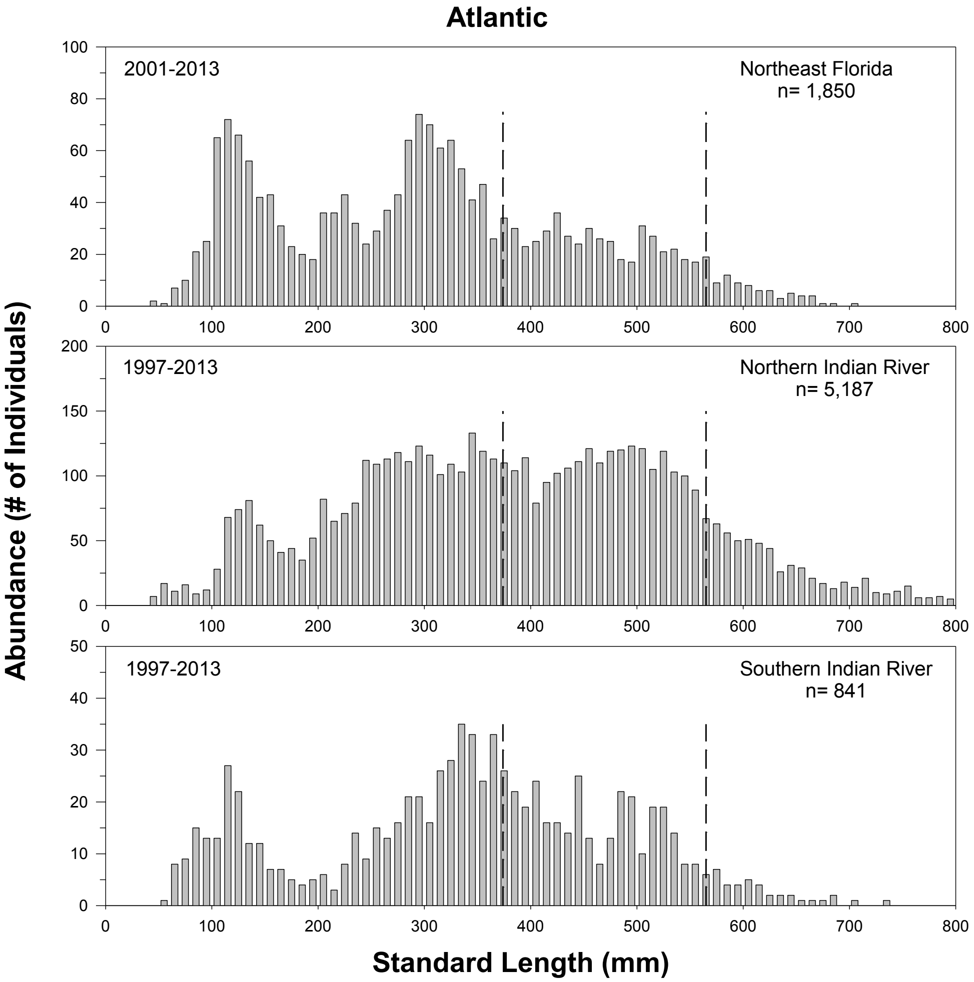


Figure SP13-01. (Continued) Relative abundance of young-of-the-year Red Drum (≤ 40 mm SL) collected in 21.3-m seines and of legal-size Red Drum (374-565 mm SL) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems.



SP13-02. Length frequency diagrams of Red Drum collected in 183-m haul seines from six Florida estuarine systems. Area between dashed lines (- - -) indicates permitted recreational harvest size range. All lengths are standard length (SL). Note different scales and years of collection among plots.



SP13-02. (Continued) Length frequency diagrams of Red Drum collected in 183-m haul seines from six Florida estuarine systems. Area between dashed lines (- - -) indicates permitted recreational harvest size range. All lengths are standard length (SL). Note different scales and years of collection among plots.

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Spotted Seatrout, *Cynoscion nebulosus*

Spotted Seatrout, *Cynoscion nebulosus*, occur in temperate to tropical estuarine and coastal waters on the Atlantic and Gulf of Mexico (Gulf) coasts of the United States (Bortone 2003). In Florida, Spotted Seatrout have historically supported economically-important recreational and commercial fisheries. Overall, annual commercial landings of Spotted Seatrout in Florida declined quite slowly during the period 1950 through the 1970s. During the 1980s, the decline accelerated, especially in the Southwest region (Murphy et al. 2011). Statewide commercial landings never exceeded much more than 500,000 fish during the early 1990s and dropped drastically to fewer than 50,000 fish after implementation of the constitutional amendment banning the use of entangling gear in 1995 and the establishment of a 3-month open season in 1996 (Murphy et al. 2010). Declines in the number of commercial trips from the mid-1980s to more recent years were over 90% on the Atlantic coast and nearly 99% on the Gulf coast (Murphy et al. 2010). Commercial effort levels continue to be significantly less than the recreational sector (Murphy et al. 2011). Since the mid-1990s various commercial and recreational fishing regulations have been adopted in an effort to support the rebuilding of Spotted Seatrout stocks (Murphy et al. 1999). With these regulatory changes, the Spotted Seatrout fishery has moved from a mixed–sector fishery, with about 20% of the landings made by commercial fishers, to an almost exclusive recreational fishery (Chagaris et al. 2008). Total estimated landings for this species in Florida during 2009 were 1,589,030 fish, with 98% of this total from the recreational fishery (Murphy et al. 2011).

Adult Spotted Seatrout begin to spawn in March or April in southwest and west-central Florida estuaries (i.e., Tampa Bay and Charlotte Harbor; McMichael and Peters 1989) and in April or May in the more northerly Florida estuaries (i.e., northern Indian River Lagoon (IRL): Tabb 1961, Crabtree and Adams 1998; Cedar Key: Moody 1950; and Apalachicola Bay: Devries et al. 2002). Spotted Seatrout are generally reproductively mature at age 2 (males > 200 mm standard length [SL]; females > 235 mm SL; Murphy et al. 2006). Protracted spawning of Spotted Seatrout continues throughout the summer and into late September or October, depending upon location (Murphy et al. 1999). Spawning generally occurs during the evening hours in deep channels and depressions near grass flats in estuarine areas with water temperatures >21°C (Tabb 1966; Helser et al. 1993). Estuarine water temperatures below 20°C may reduce hatching success for Spotted Seatrout (Gray et al. 1991).

In an effort to monitor year-class strength and to improve the ability to predict future adult Spotted Seatrout abundances, relative indices of abundance (IOAs) were developed for young-of-the-year (YOY) Spotted Seatrout recruitment into selected Florida estuaries. Abundance data for YOY Spotted Seatrout (≤ 100 mm SL) collected from stratified-random 21.3-m seine samples were examined to assess recruitment in six Florida estuaries: (in order of inception) Tampa Bay, Charlotte Harbor, northern IRL, Cedar Key, Apalachicola Bay, and northeast Florida. Young-of-the-year Spotted Seatrout recruited to habitats sampled with 21.3-m seines primarily from April through October in Tampa Bay and Charlotte Harbor, and from May through November in the northern IRL, northeast Florida, and Cedar Key. In Apalachicola Bay, recruitment of YOY Spotted Seatrout was evident from June through October. These recruitment periods coincide with published recruitment and spawning periods of Spotted Seatrout throughout Florida (Moody 1950; Nelson and Leffler 2001; Devries et al. 2002; Walters et al. 2007). Therefore, these bay-specific months were used to define the respective recruitment seasons for each estuary in subsequent analyses. Indices of abundance for YOY Spotted Seatrout were not calculated for the southern IRL where 21.3-m seines were not included as a sampling gear. Data from stratified-random 183-m haul seines collected within these same Florida estuarine systems (including the southern IRL) were used to develop IOAs for adult Spotted Seatrout (≥200 mm SL). These IOAs were derived by including all Spotted Seatrout ≥200 mm SL collected between January and December from 1996 to 2013.

Trends in relative abundance of juvenile Spotted Seatrout in Tampa Bay have remained relatively stable since the mid 1990s, but do exhibit an overall downward trend (Figure SP13-03). With the exception of strong year classes evident in 1996 and 1997, recruitment of YOY Spotted Seatrout in riverine habitats has been stable, but low. In bay habitats, peaks in abundance were observed in 1996 and 2004; a noticeably lower, but stable trend was observed from 2005 through 2013. Abundance of YOY Spotted Seatrout in Charlotte Harbor riverine habitats has remained stable since 1996, with one strong year class in 1997. In Charlotte Harbor bay habitats, after strong year classes in 1996 and 1997, abundance has remained stable, but low through 2013. Patterns of relative abundance for adult Spotted Seatrout in Tampa Bay and Charlotte Harbor have been variable, but relatively stable since 1996 (Figure SP13-03). Periods of greater abundance occurred in 2003, 2008, and 2010-2011 in Tampa Bay, and in 2002 and 2004 in Charlotte Harbor. Overall adult catches in these systems was low and as such, the magnitude of peaks in abundance was also small.

Indices of abundance for YOY Spotted Seatrout on Florida's northwest coast have been variable, but relatively stable since 1996 (Figure SP13-03). The IOAs of YOY Spotted Seatrout in Apalachicola Bay varied without trend with stronger year classes in 2001 and 2011 (Figure SP13-03). In Cedar Key, strong year classes were evident in riverine habitats during 1996-1998 and 2002 and have otherwise remained relatively stable at lower levels. In Cedar Key bay habitats, strong year classes were evident from 1999-2000 and to a lesser degree in 2012. The IOAs for adult Spotted Seatrout in Apalachicola Bay indicated a general increase in abundance since 2003. In Cedar Key, a strong year class was observed in adult Spotted Seatrout in 1998 and subsequent abundances have remained low, but stable through 2013 (Figure SP13-03).

Trends in YOY Spotted Seatrout abundance on Florida's Atlantic coast have been relatively stable with periodic small fluctuations in recruitment (Figure SP13-03). In northeast Florida, IOAs for YOY Spotted Seatrout varied without trend. Indices of abundance for adult Spotted Seatrout in northeast FL have been relatively stable since 2001, with the exception of noticeable decreases in 2004 and 2013. In the northern IRL, IOAs for YOY Spotted Seatrout peaked in 1996 and then decreased to lower, but relatively stable, levels through 2013. Adult Spotted Seatrout IOAs in the northern IRL have generally fluctuated without trend with the exception of one increase in abundance seen in 2011. In the southern IRL, relative abundance of adult Spotted Seatrout has remained low, but stable since 1997; however, due to the comparatively small sample size in this area, results should be interpreted with caution.

The 183-m haul seines provides valuable length-frequency data on sub-adult and adult Spotted Seatrout over 100 mm SL and up to 600 mm SL (Figure SP13-04).Two or three distinct peaks in size frequency were evident from the 183-m haul seine data collected within the Gulf coast estuaries. The smaller peak primarily consisted of fish ~100-200 mm SL, while the larger peak(s) consisted of adults >200 mm SL. The size distributions of Spotted Seatrout collected with 183-m haul seines in the Atlantic coast estuaries indicated two distinct peaks in northeast Florida, but was unimodal in the northern IRL. In all sampling areas, abundance dropped off sharply as the permitted recreational harvest size (325 mm SL) was reached.

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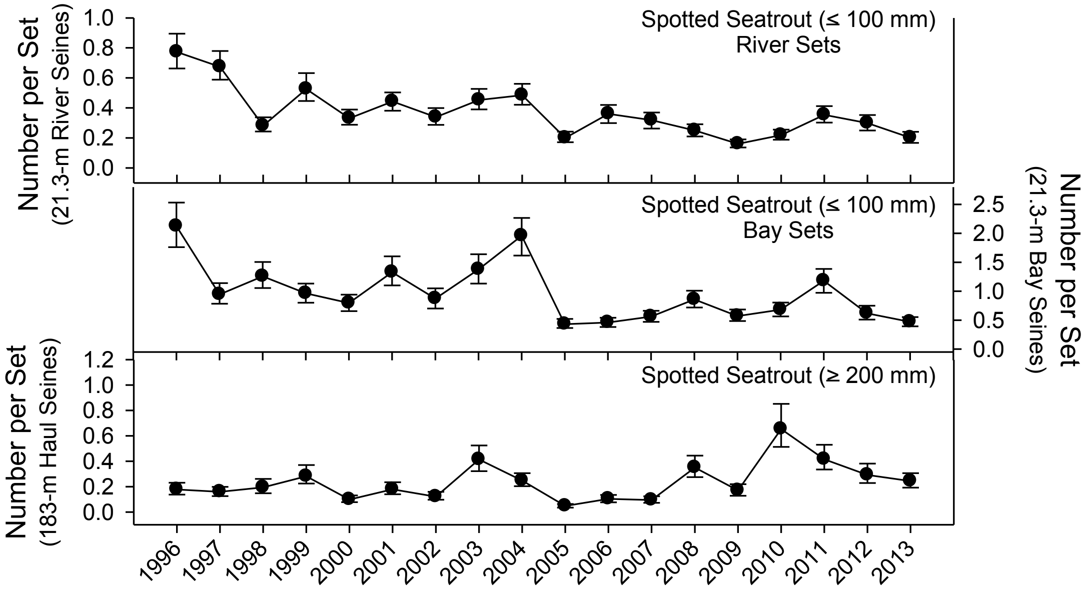
Tampa Bay



Charlotte Harbor

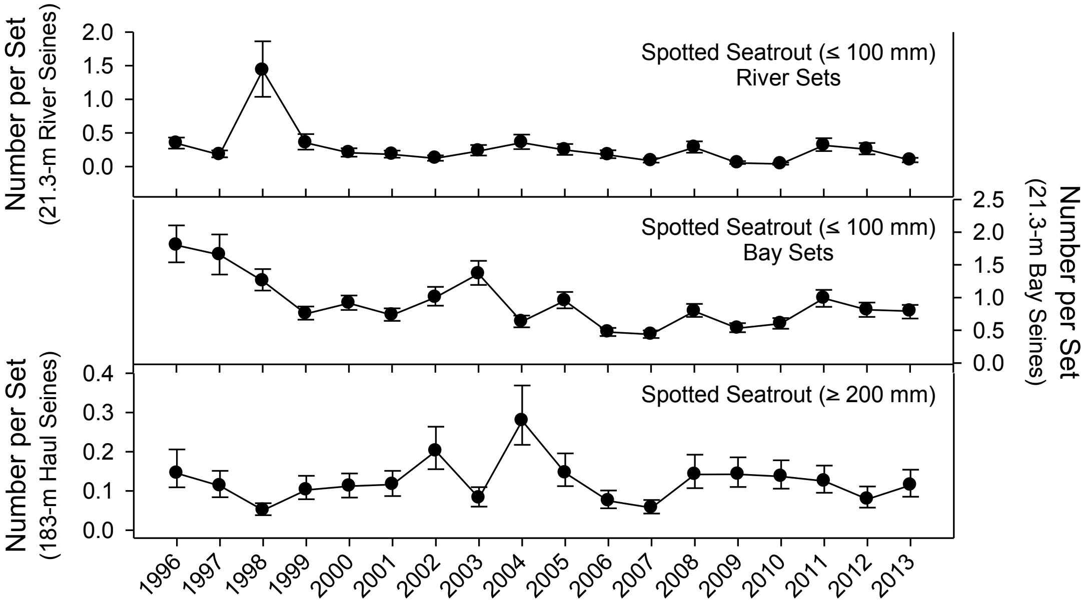
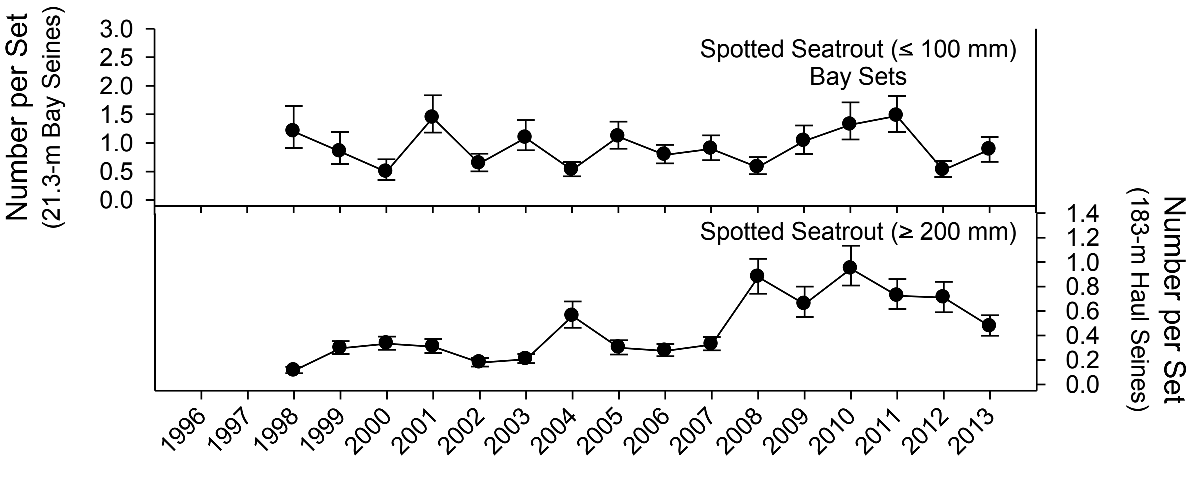


Figure SP13-03. Relative abundance of young-of-the-year Spotted Seatrout (≤ 100 mm SL) collected in 21.3-m seines and of reproductively mature Spotted Seatrout (≥ 200 mm SL) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems. In some instances, where sufficient numbers of individuals were captured, separate plots for river and bay sets were created to examine differences in YOY recruitment between the two habitats. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gears and estuaries.

Apalachicola Bay



Cedar Key

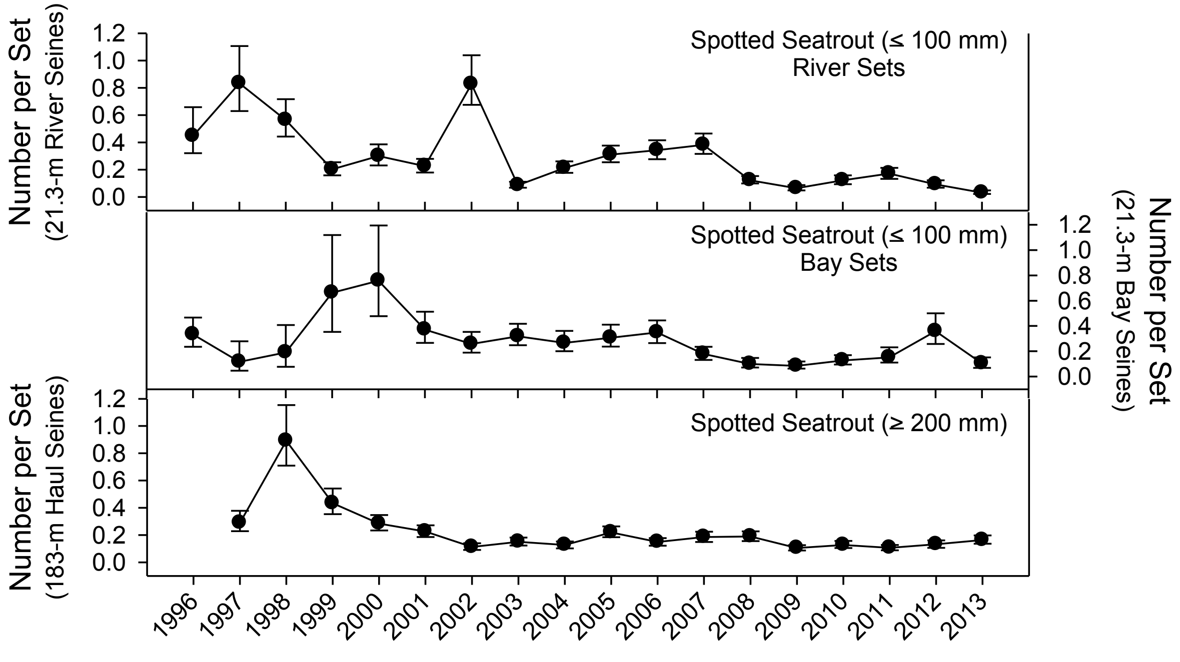
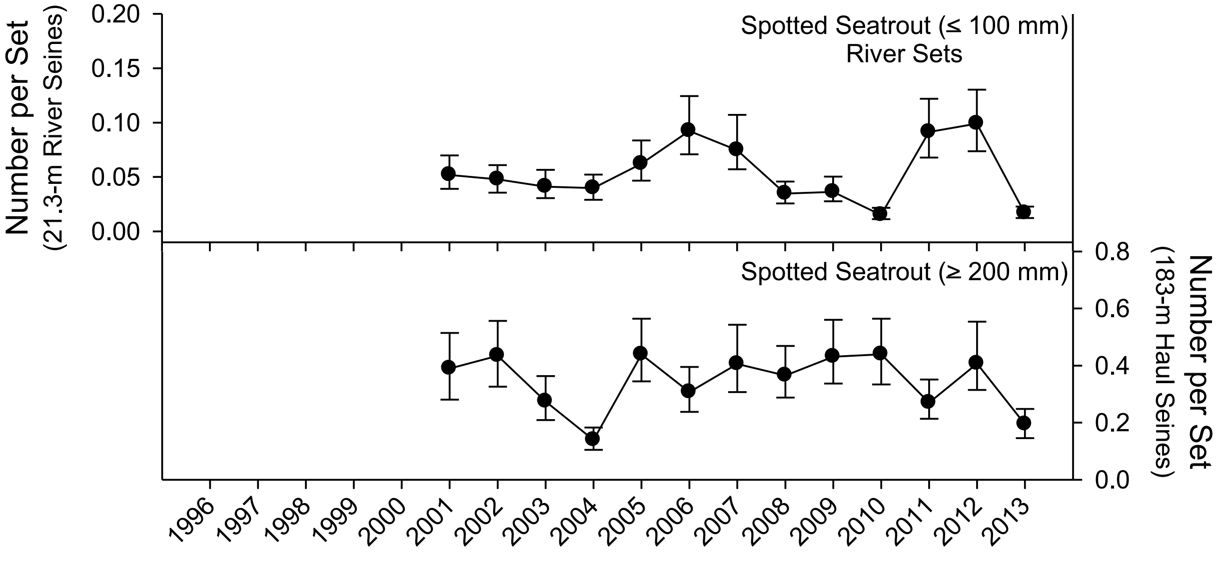


Figure SP13-03. Relative abundance of young-of-the-year Spotted Seatrout (≤ 100 mm SL) collected in 21.3-m seines and of reproductively mature Spotted Seatrout (≥ 200 mm SL) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems.

Northeast Florida



Indian River Lagoon

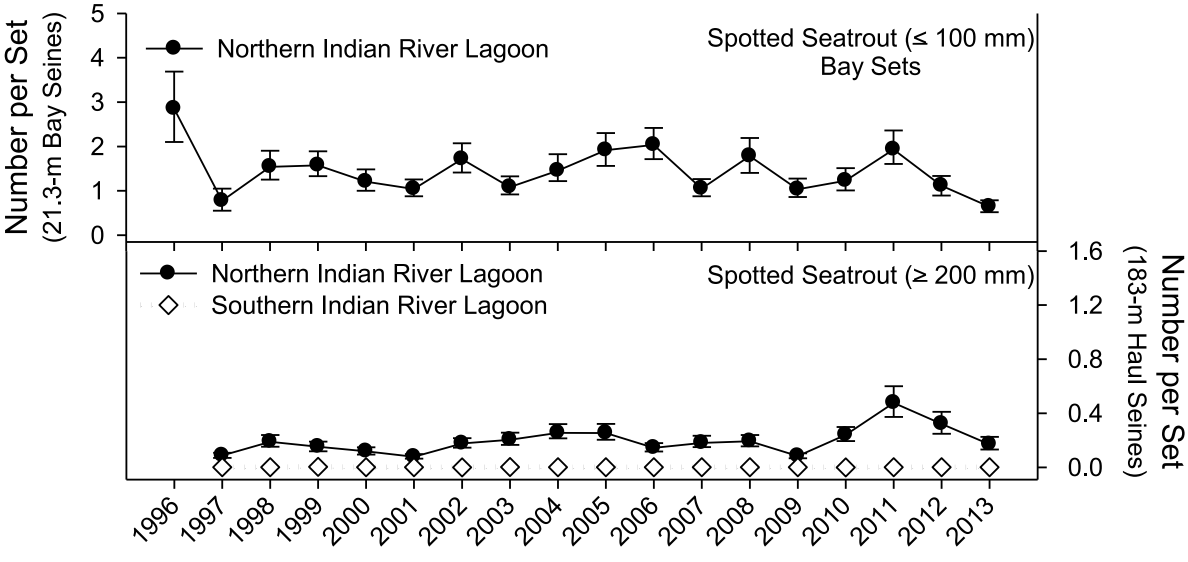


Figure SP13-03. Relative abundance of young-of-the-year Spotted Seatrout (≤ 100 mm SL) collected in 21.3-m seines and of reproductively mature Spotted Seatrout (≥ 200 mm SL) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems.

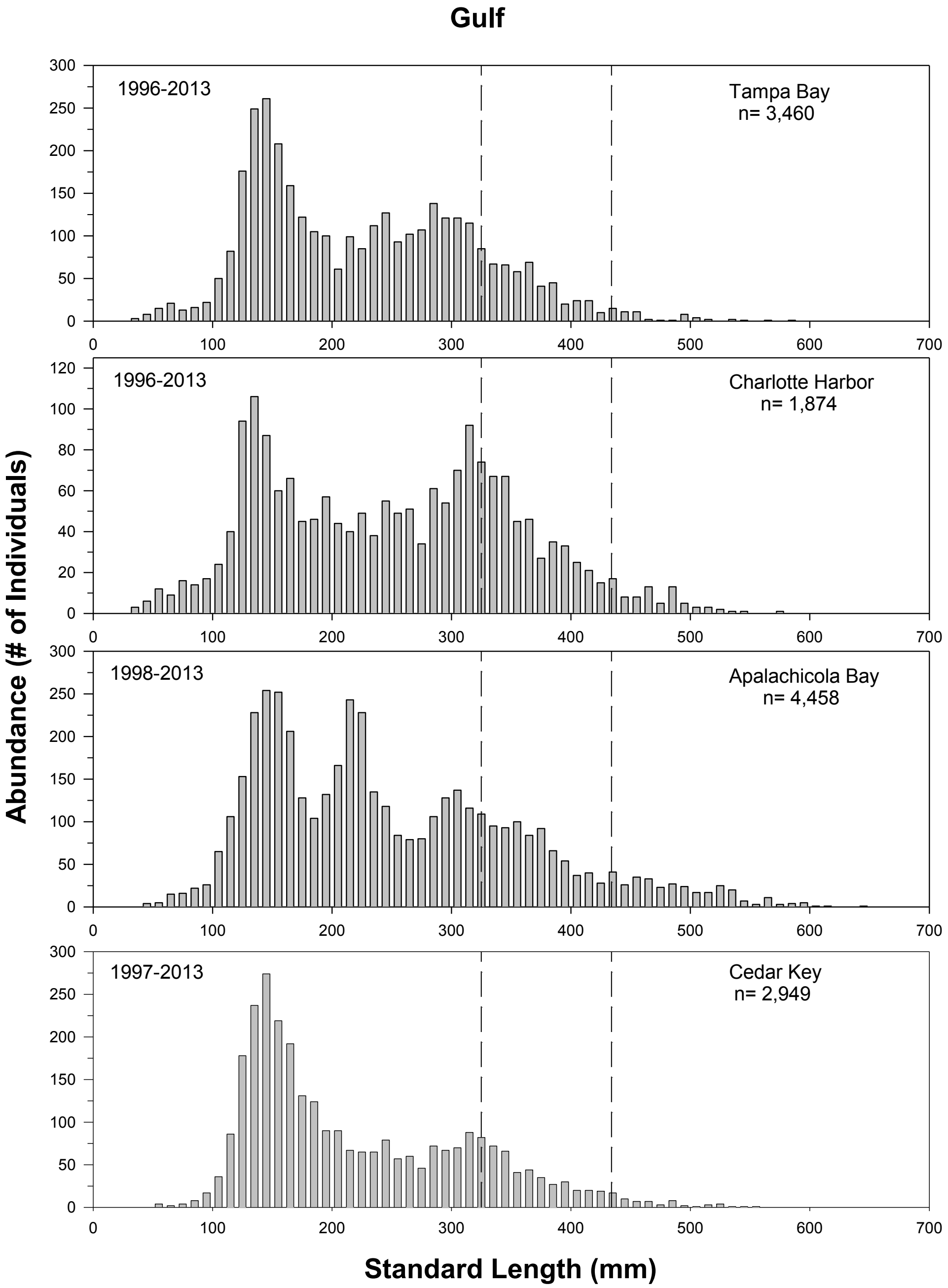


Figure SP13-04. Length frequency diagrams of Spotted Seatrout collected in 183-m haul seines from six Florida estuarine systems. Area between dashed lines (- - -) indicates permitted recreational harvest size range (325 to 434 mm SL). Current Florida regulations allow anglers to keep one fish greater than the maximum slot limit size. All lengths are standard length (SL). Note different scales and years of collection among plots.

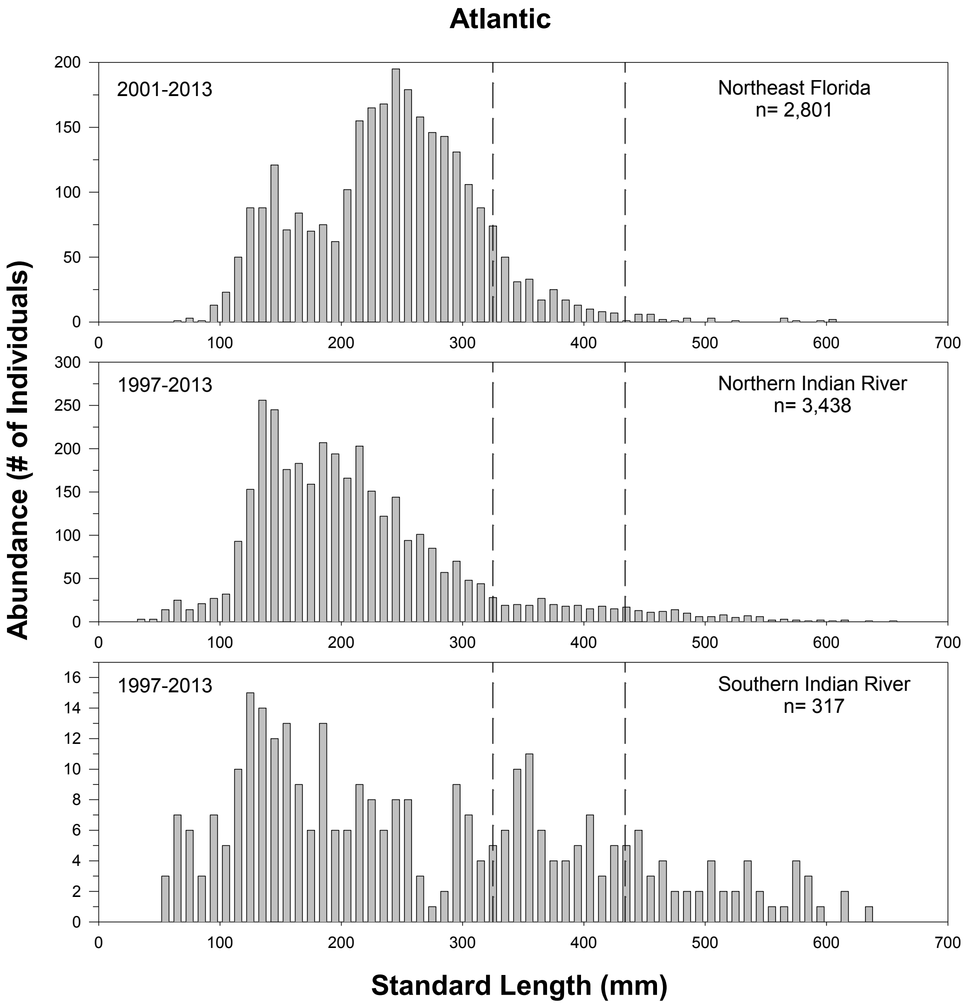


Figure SP13-04. (Continued) Length frequency diagrams of Spotted Seatrout collected in 183-m haul seines from six Florida estuarine systems. Area between dashed lines (- - -) indicates permitted recreational harvest size range (325 to 434 mm SL). Current Florida regulations allow anglers to keep one fish greater than the maximum slot limit size. All lengths are standard length (SL). Note different scales and years of collection among plots.

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Sheepshead, *Archosargus probatocephalus*

The Sheepshead, *Archosargus probatocephalus*, is common in coastal estuarine and inner- to mid-shelf waters from Cape Cod to Brazil (Jennings 1985). Recreational and commercial fishermen commonly harvest Sheepshead, with the recreational fishery accounting for almost 90% of the total pounds landed in recent years (Munyandorero et al*.* 2006). Sheepshead in Florida waters are currently regulated by minimum size (305-mm total length) and a bag limit (15 fish/day). The most recent stock assessment for Sheepshead used Fisheries-Independent Monitoring (FIM) program data to derive annual indices of abundance (IOAs) during different life history stages to guide coast-specific catch-at-age models (Munyandorero et al. 2006). This stock assessment determined that Sheepshead stocks on the Gulf and Atlantic coasts appeared abundant enough to supply adequate numbers of new recruits while maintaining current harvest rates.

Adult Sheepshead reproduce between February and April in Florida waters and the newly recruited young-of-the-year (YOY) are most abundant in shallow estuarine areas between April and June. Young-of-the-year Sheepshead grow approximately 0.32 mm per day (FWC-FMRI 2001) and typically reach 40 mm standard length (SL) at two months and 130 mm SL at one year of age. Sheepshead in Florida waters enter the fishery at 268 mm SL, which typically corresponds to an age of 3 - 6 years (Dutka-Gianelli and Murie 2001).

To monitor year-class strength and improve the ability to predict future adult Sheepshead abundance, the FIM program developed annual IOAs for three life history stages: YOY, pre-fishery, and fully-recruited. Abundance data for YOY ($\leq$40 mm SL) collected in stratified-random 21.3-m seines were examined to assess recruitment into three Florida estuaries: (in order of FIM program inception) Tampa Bay, Charlotte Harbor, and the northern Indian River Lagoon (IRL). This life history stage was not examined for Apalachicola Bay, Cedar Key, or northeast Florida due to small sample sizes. Indices of abundance of YOY Sheepshead were not calculated for southern IRL where 21.3-m seines were not included as a sampling gear. Young-of-the-year Sheepshead recruited to habitats sampled with 21.3-m seines primarily from April through June. These months were used to define the respective recruitment seasons for each estuary in subsequent analyses. Abundance indices were calculated for pre-fishery Sheepshead (131-267 mm SL) and those fully recruited to the fishery (≥268 mm SL) for seven Florida estuarine areas: Tampa Bay, Charlotte Harbor, northern Indian River Lagoon, southern Indian River Lagoon, Cedar Key, Apalachicola Bay, and northeast Florida. Data from stratified-random 183-m haul seines were used to develop IOAs for pre-fishery and fully-recruited Sheepshead from January through December of each year.

Annual trends in YOY Sheepshead IOAs were variable between the two southwest Florida estuaries, Tampa Bay and Charlotte Harbor. Young-of-the-year IOAs for both estuaries have been relatively stable since 1996 with infrequent strong year classes evident (Figure SP13-05). In Tampa Bay, stronger year classes occurred in 1997, 2000, and 2008 in the bay habitats, with slight abundance peaks in 2000 and 2012 in the river habitats. In Charlotte Harbor, YOY Sheepshead IOAs were relatively stable from 1996-2013, with a strong year class in 2008, similar to what was observed in Tampa Bay. Annual IOAs of pre-fishery Sheepshead exhibited a general cyclical pattern in Tampa Bay with slight peaks in 1999, 2004, and 2012, followed by a large peak in abundance in 2013. Annual IOAs of pre-fishery Sheepshead in Charlotte Harbor remained relatively stable from 1996-2013, with peaks in 2010 and 2013. Annual IOAs of fully-recruited Sheepshead in Tampa Bay have remained relatively stable through 2013. Abundance of fully-recruited Sheepshead in Charlotte Harbor varied only slightly from 1996-2012, with slight peaks in 1998, 2002, and 2008. The abundance of fully-recruited Sheepshead in Charlotte Harbor increased dramatically in 2013.

Annual IOAs were only calculated for pre-fishery and fully-recruited Sheepshead in the two northwest Florida estuaries of Apalachicola Bay and Cedar Key (Figure SP13-05). Trends in abundance for pre-fishery Sheepshead in Apalachicola Bay have been low, but relatively stable, with a peak in 2013. Pre-fishery IOAs have been variable but relatively stable in Cedar Key since 1997 with lower abundance during 2005, and peaks in abundance in 1999, 2003, 2008, and 2012. Annual IOAs for fully-recruited Sheepshead in Apalachicola Bay gradually increased from 1998-2002, and have remained relatively consistent since then. Abundance of fully-recruited Sheepshead in Cedar Key have exhibited a general decreasing trend since 1997.

Abundance estimates of pre-fishery Sheepshead in northeast Florida declined from 2002-2006, and have been relatively stable at lower abundances since (Figure SP13-05). Abundance estimates for fully recruited Sheepshead in northeast Florida increased from 2001-2004, followed by a general decreasing trend through 2013 (Figure SP13-05). Young-of-the-year IOAs for northern IRL riverine habitats were quite variable with strong year classes evident in 2001, 2003-2004, and 2008. Extremely low abundances were seen in 2002 and 2010 (Figure SP13-05). Young-of-the-year IOAs in northern IRL bay habitats were stable at low abundances from 1998-2003 and have been more variable since with peaks in abundance occurring in 2004, 2007, 2009, and 2012-2013. Pre-fishery IOAs for the northern IRL were low but relatively stable from 1997 through 2009. A slight increase was seen in 2010 and 2011, followed by a dramatic increase in abundance during 2012 and 2013. Pre fishery IOAs for the southern IRL have been relatively stable over the time series with a slight peak in abundance in 2013. Annual IOAs of fully-recruited Sheepshead in the southern IRL varied without trend from 1997 through 2013. Northern IRL IOAs of fully-recruited Sheepshead were lower than the Southern IRL. Abundance estimates were relatively stable from 1997-2011, with slight increases in 2012 and 2013.

Length-frequency data collected with 183-m haul seines provides valuable information on late YOY, pre-fishery, and fully-recruited Sheepshead (Figure SP13-06). The length frequency indices generally indicated multiple cohorts captured in the 183-m seines. The first cohort occurred between 60-100 mm, a second slightly larger cohort occurred between 100-200 mm SL. This ‘fully-recruited’ mode was generally shifted to the right in the northern Florida estuaries (>300 mm SL; Apalachicola Bay, Cedar Key, northeast Florida, and northern IRL) and was slightly smaller in the southern Florida estuaries (~ 250 mm SL, Tampa Bay, Charlotte Harbor, and southern IRL). Modal peaks in length frequencies did not appear to be truncated above the legal minimum size.

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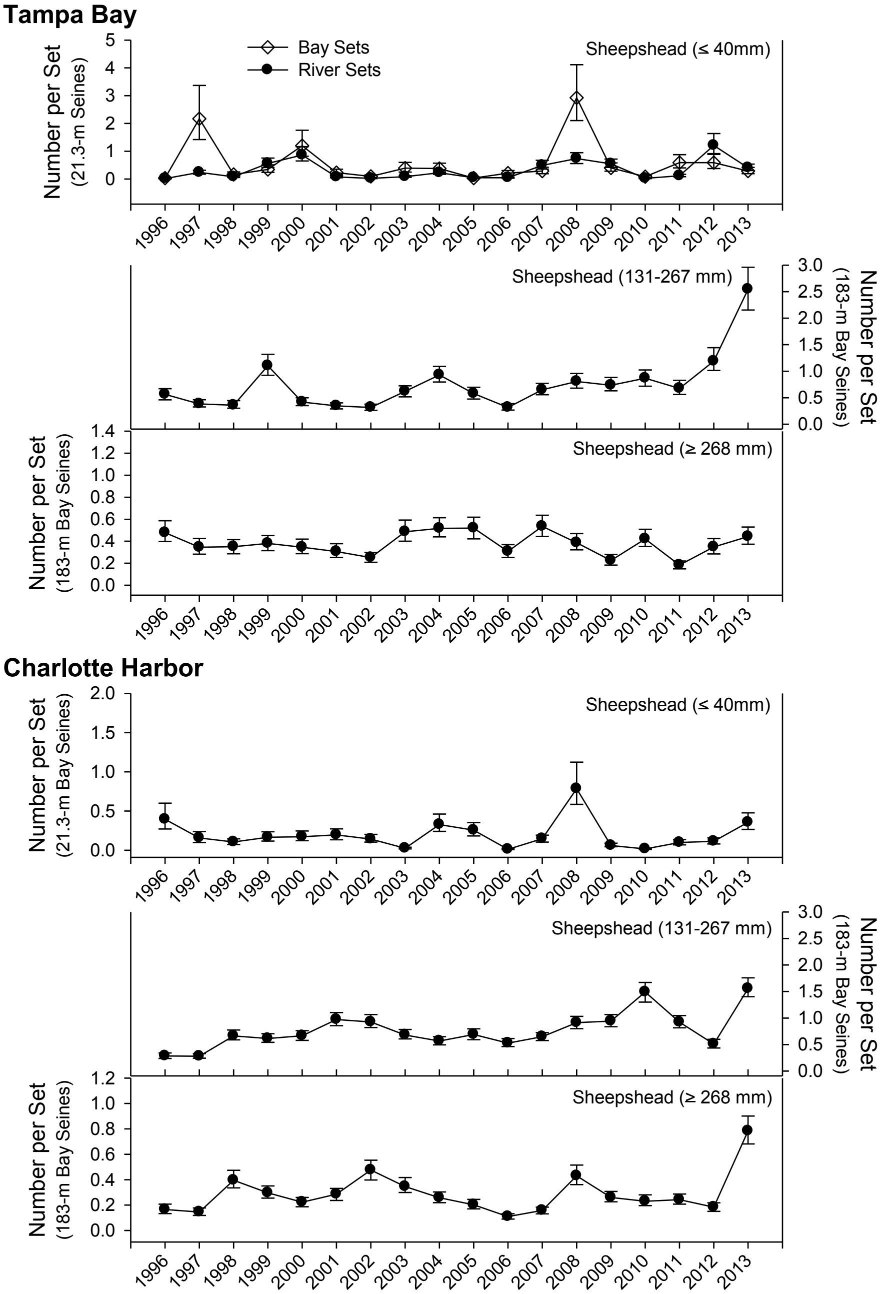


Figure SP13-05. Relative abundance of young-of-the-year Sheepshead (≤ 40 mm SL) collected in 21.3-m seines between 1996 and 2013 and pre-fisherey (131-267 mm SL) and fully-recruited Sheepshead (≥ 268 mm SL) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems. In some instances, where sufficient numbers of individuals were captured, separate plots for river and bay sets were created to examine differences in recruitment. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gears and estuaries.

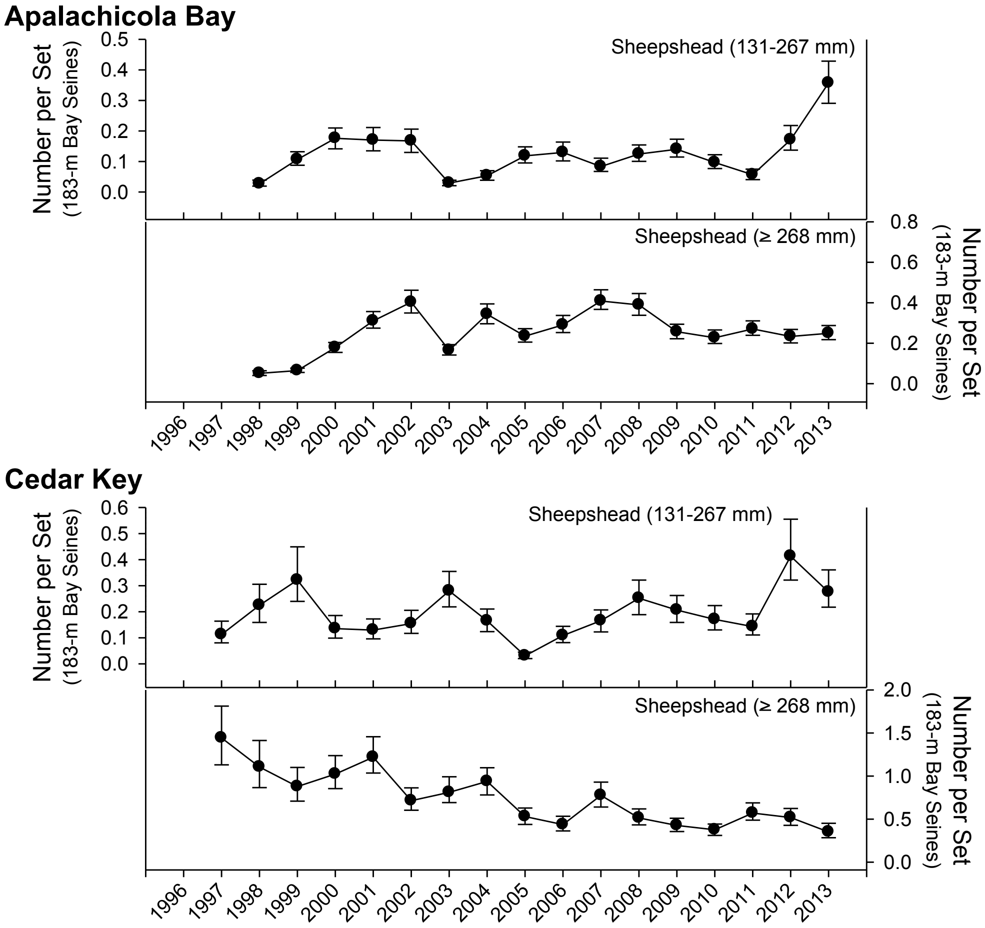
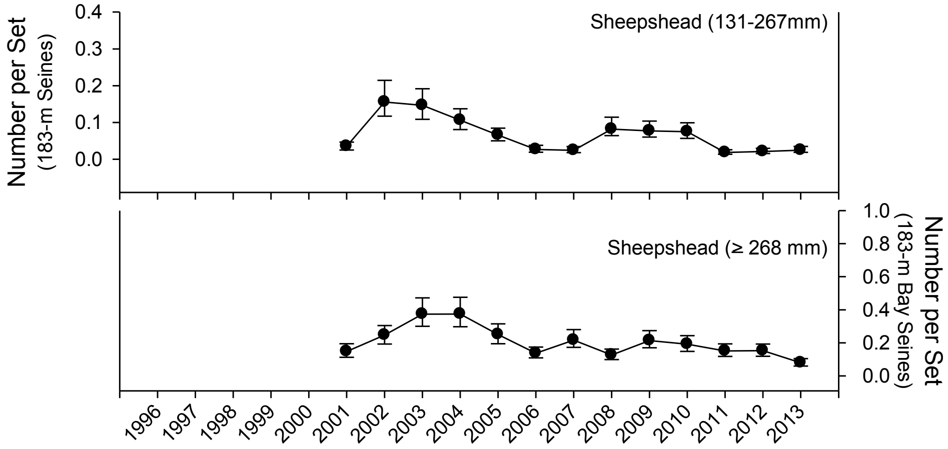


Figure SP13-05. (Continued) Relative abundance of young-of-the-year Sheepshead (≤ 40 mm SL) collected in 21.3-m seines between 1996 and 2013 and pre-fisherey (131-267 mm SL) and fully-recruited Sheepshead (≥ 268 mm SL) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems.

Northeast Florida



Indian River Lagoon

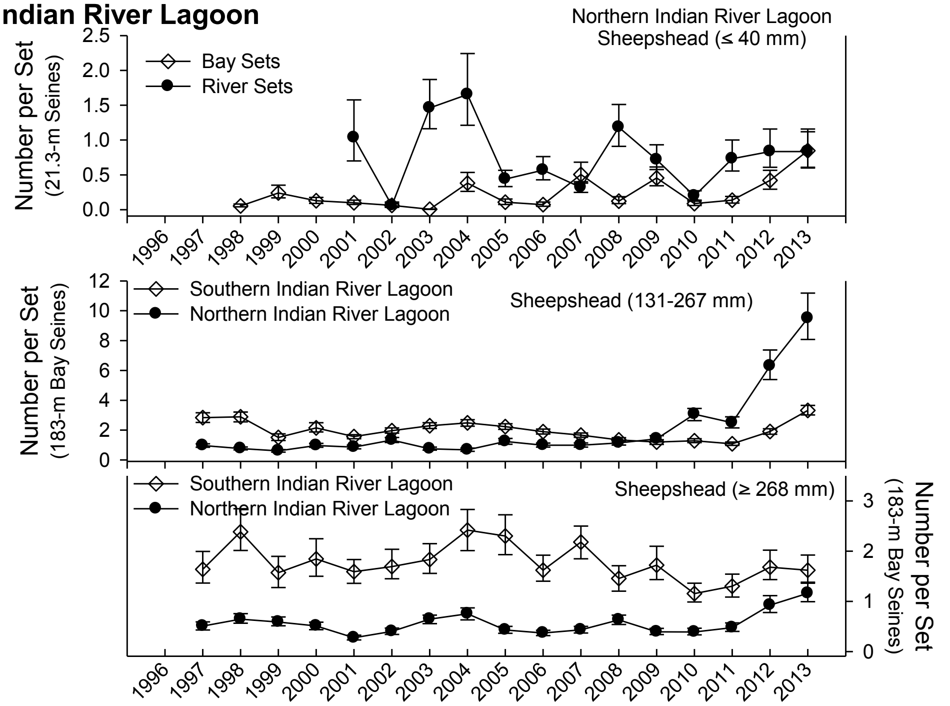


Figure SP13-05. (Continued) Relative abundance of young-of-the-year Sheepshead (≤ 40 mm SL) collected in 21.3-m seines between 1996 and 2013 and pre-fisherey (131-267 mm SL) and fully-recruited Sheepshead (≥ 268 mm SL) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems.

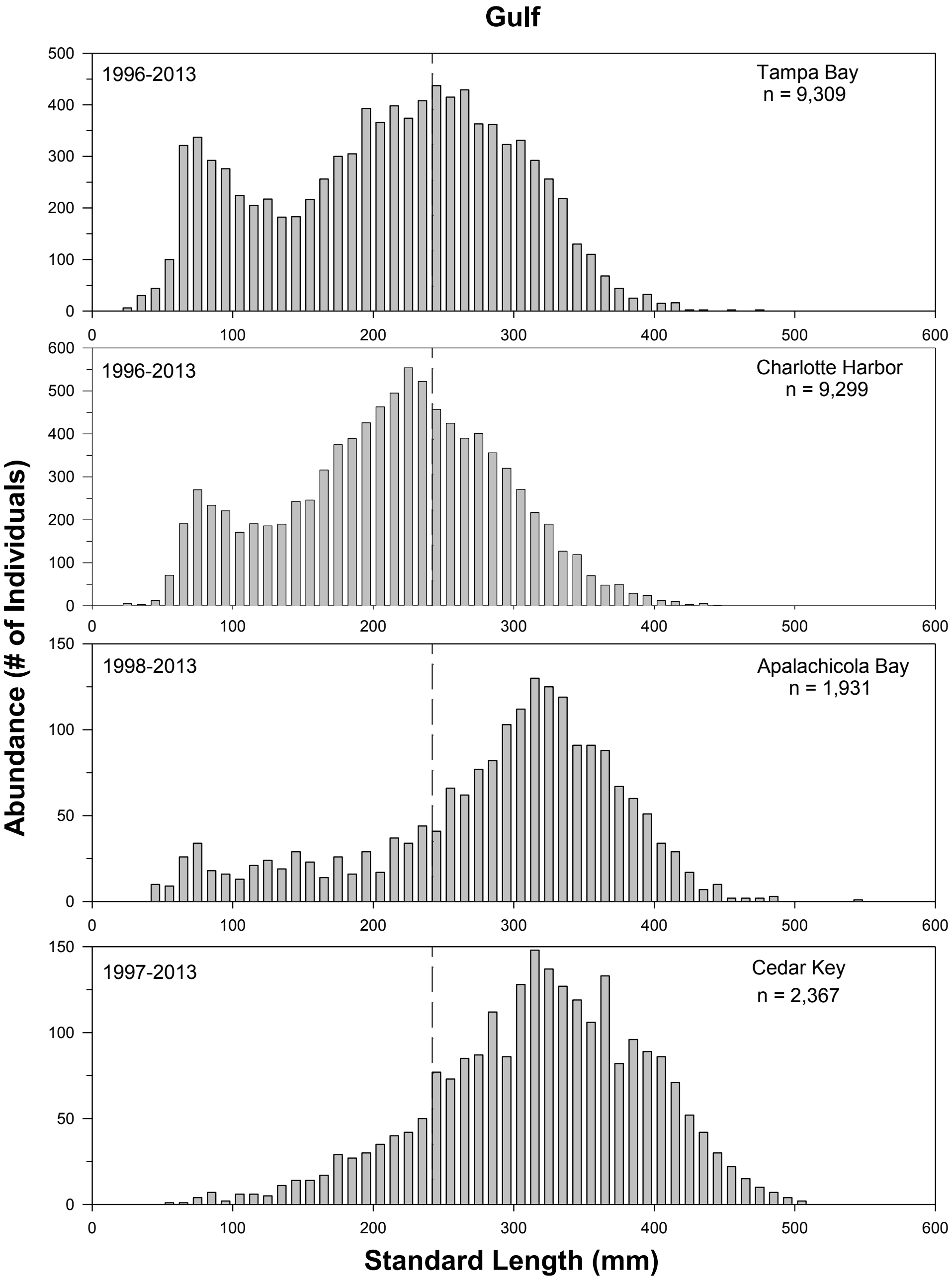


Figure SP13-06. Length frequency diagrams of Sheepshead collected in 183-m haul seines from six Florida estuarine systems. Area after dashed line (- - -) indicates permitted recreational minimum harvest length (242 mm SL). All lengths are standard length (SL). Note different scales and years of collection among plots.

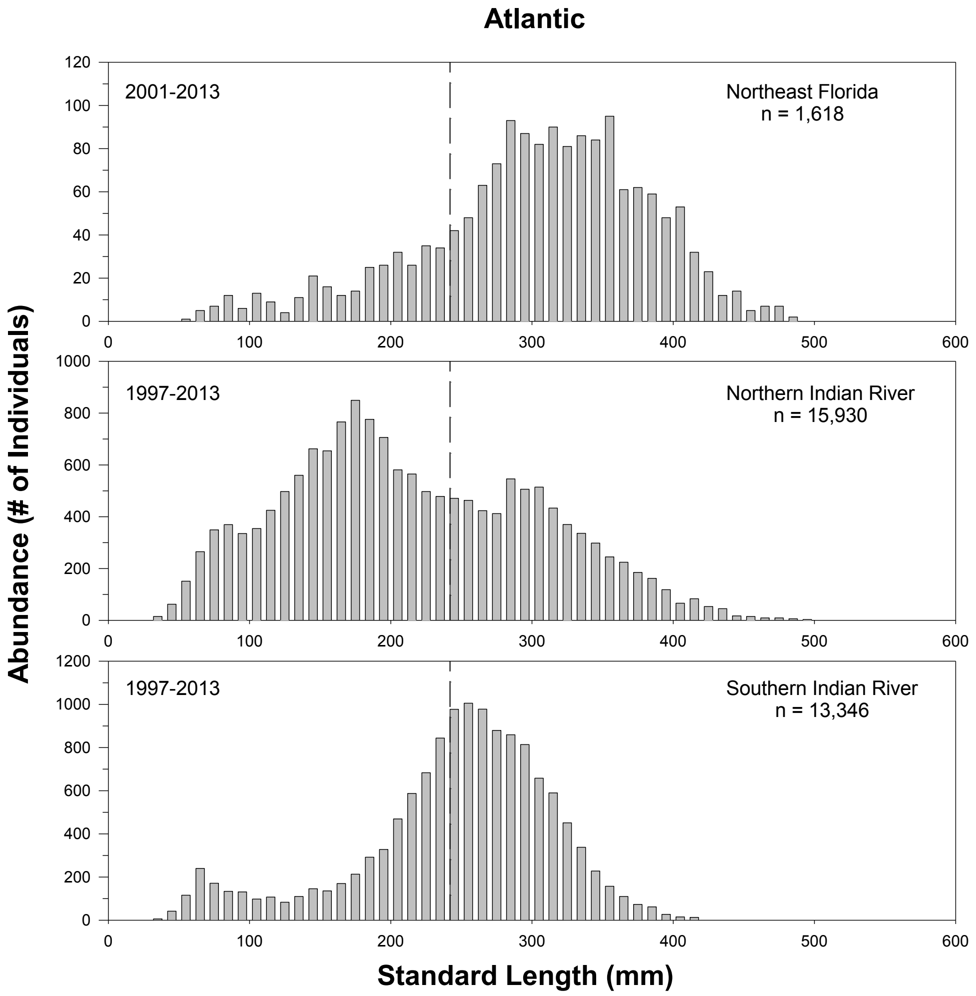


Figure SP13-06. (Continued) Length frequency diagrams of Sheepshead collected in 183-m haul seines from six Florida estuarine systems. Area after dashed line (- - -) indicates permitted recreational minimum harvest length (242 mm SL). All lengths are standard length (SL). Note different scales and years of collection among plots.

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Striped Mullet, *Mugil cephalus*

Striped Mullet, *Mugil cephalus*, are one of Florida's most abundant and widespread estuarine-dependent fishes (Odum 1970; Leard et al. 1995). Striped Mullet supported a valuable commercial fishery from the early 1960s through the late 1980s, with approximately 90% of all U.S. landings occurring in the Gulf of Mexico (Gulf) and over 80% of all commercial landings occurring in Florida waters (Rivas 1980; Leard et al. 1995). Changes were documented from 1991 to 1994 when commercial Striped Mullet landings in Florida severely declined from 79% to 46% of the total Gulf production (Leard et al. 1995). Following the implementation of the Florida net limitation referendum (July 1, 1995), which eliminated the use of entangling nets within three miles of the Atlantic coast and nine miles of the Gulf coast, Striped Mullet commercial landings were further reduced to about 5.1 million pounds (Mahmoudi 1997). After an initial decline in fishing effort and landings following the net limitation ban, fishing effort and landings have gradually increased to about 8.1 million pounds annually (Mahmoudi 2000; Mahmoudi 2005). Despite these increases, overall fishing mortality rates have declined substantially since the net limitation ban, resulting in a significant increase in overall stock size and spawning stock biomass in recent years. Stocks throughout the state of Florida are healthy, and current levels of fishing effort appear to be sustainable (Mahmoudi 2005). Currently, cast nets are used in both the recreational and commercial fisheries.

Striped Mullet form large schools in estuarine and nearshore waters from October to December, prior to their migration offshore. These schools migrate to offshore spawning areas over the outer continental shelf and slope during the passage of weather fronts from October through February. Typically, young-of-the-year (YOY) Striped Mullet recruit to Florida's estuaries at 20 to 35 mm standard length (Kilby 1949; Futch 1966). Recruitment usually begins in January and continues through April, with peaks in abundance during February and March; however, previous analysis of length-frequency data indicated that recruitment has occurred in Florida's estuaries as early as the end of December.

In an effort to monitor year class strength and to improve the ability to predict future adult Striped Mullet abundances, relative indices of abundance (IOAs) were developed for YOY Striped Mullet recruitment into selected Florida estuaries. Abundance data for YOY Striped Mullet ≤ 35 mm standard length (SL) that were collected in stratified-random 21.3-m seine samples were examined to assess recruitment into six Florida estuaries: (in order of sampling inception) Tampa Bay, Charlotte Harbor, northern Indian River Lagoon (IRL), Cedar Key, Apalachicola Bay, and northeast Florida. Young-of-the-year Striped Mullet recruited to habitats sampled with 21.3-m seines primarily from January to March. Therefore, these specific months were used to define the respective recruitment seasons for each estuary in subsequent analyses. Indices of abundance for YOY Striped Mullet were not calculated for the southern IRL where 21.3-m seines were not included as a sampling gear. All zones not sampled consistently throughout the time period being analyzed were excluded from the analyses.

In Tampa Bay, IOAs for YOY Striped Mullet have varied without trend in both riverine and bay habitats. Increases in abundance were evident in 2001, 2006, and 2010 for riverine habitats and in 1998, 2006, and 2010 for bay habitats (Figure SP13-07). In Charlotte Harbor, IOAs for YOY Striped Mullet have also varied without trend in riverine and bay habitats. In riverine habitats, increased abundance was evident in 2000-2002, 2004, 2006, and 2010-2011. In bay habitats, two distinct peaks in IOAs for YOY for Striped Mullet were observed; one in 1997 and a second from 2009-2010.

Indices of abundance for YOY Striped Mullet on Florida’s northwest coast were variable. In Apalachicola Bay, IOAs for YOY for Striped Mullet revealed strong year classes in 2001, 2006, and 2013 for riverine habitats and 2002 and 2006 for bay habitats (Figure SP13-07). In Cedar Key, IOAs for YOY Striped Mullet indicated one strong year class in 2011 for riverine habitats and strong year classes in 1998, 2006, and 2008 for bay habitats.

Annual IOAs of YOY Striped Mullet in northeast Florida show highly variable catch rates with peaks in abundance in 2006, 2008, and 2010-2011. Exceptionally low abundances were seen in 2012 and 2013. Annual IOAs of YOY Striped Mullet in the northern IRL riverine habitats revealed strong year classes in 2001 and 2010 (Figure SP13-07). Northern IRL bay habitats followed a similar pattern as observed in riverine habitats – generally low abundances with the exceptions of the outstanding year classes evident in 2001 and 2010.

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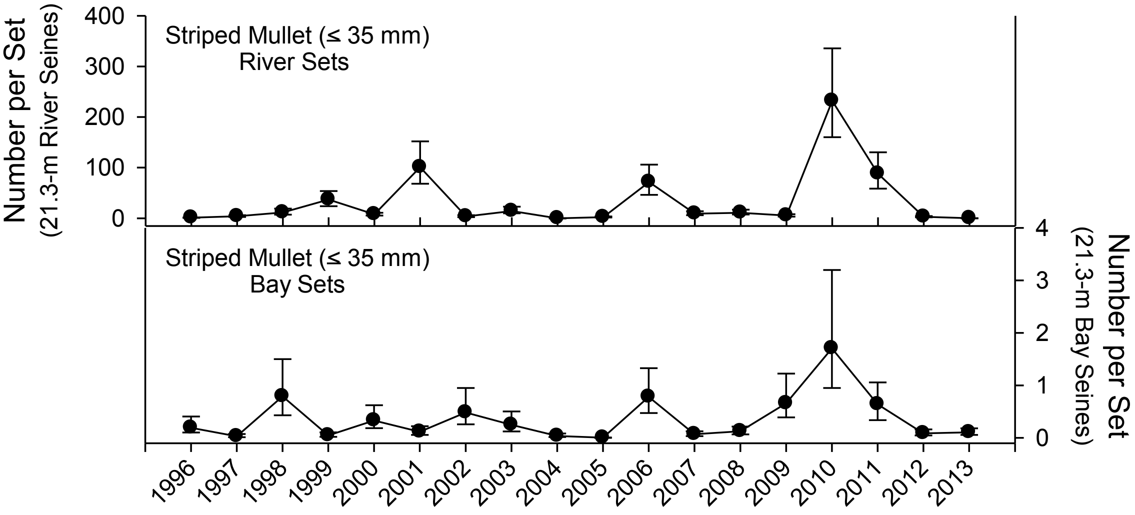
Tampa Bay



Charlotte Harbor

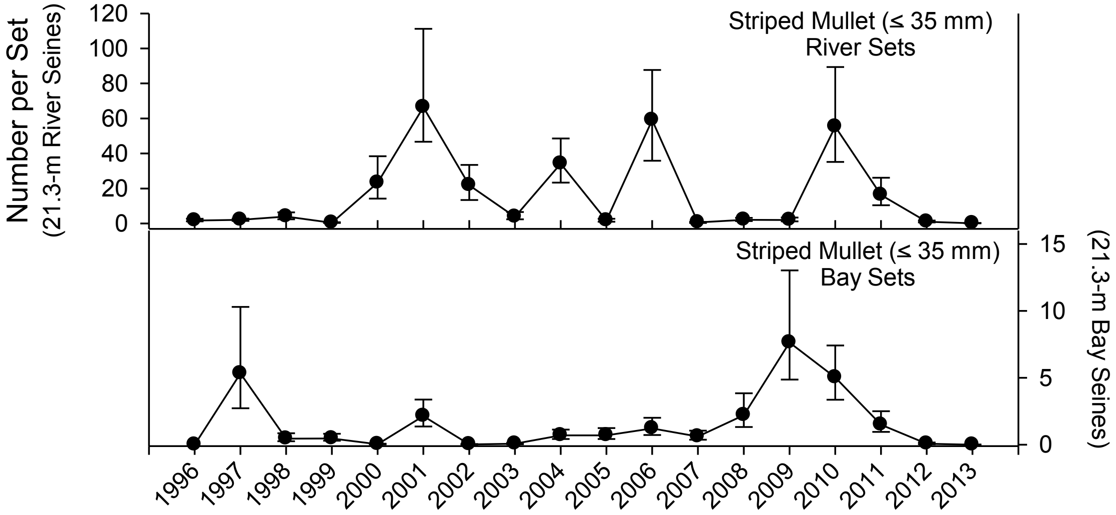
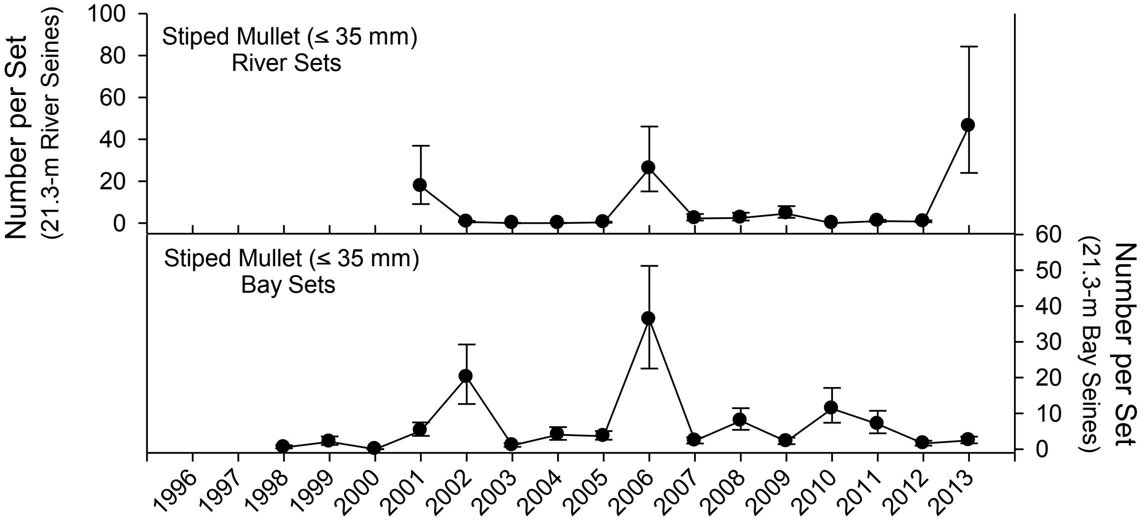


Figure SP13-07. Relative abundance of young-of-the-year Striped Mullet (≤ 35 mm SL) collected in 21.3-m seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems. In some instances, where sufficient numbers of individuals were captured, separate plots for river and bay sets were created to examine differences in recruitment between the two habitats. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gears and estuaries.

Apalachicola Bay



Cedar Key

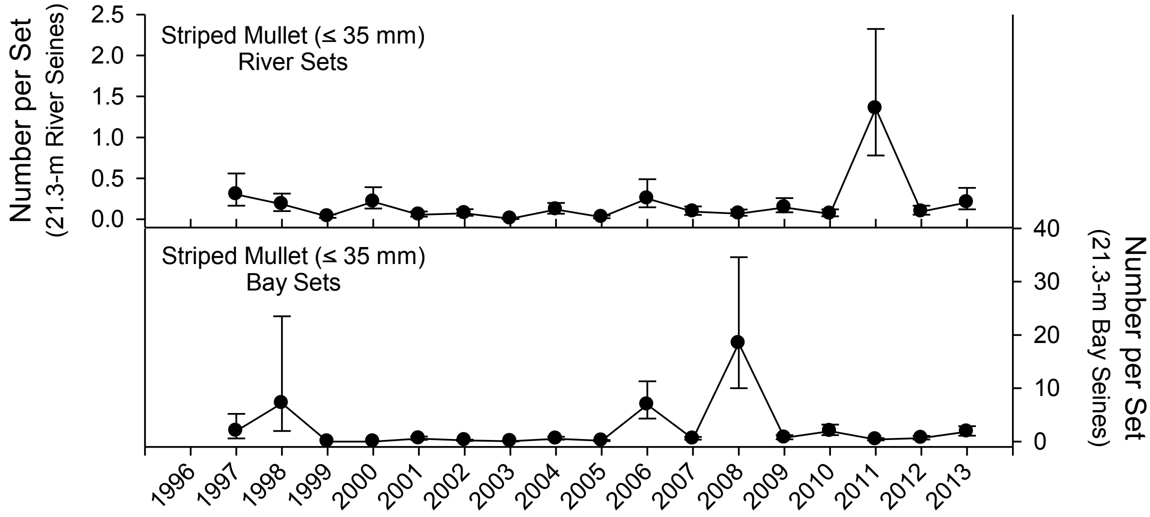
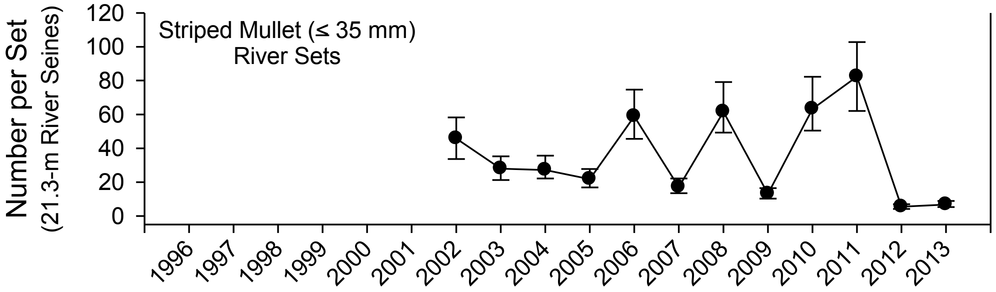


Figure SP13-07. (Continued) Relative abundance of young-of-the-year Striped Mullet (≤ 35 mm SL) collected in 21.3-m seines between 1997 and 2013 during stratified-random sampling from six Florida estuarine systems.

Northeast Florida



Indian River Lagoon

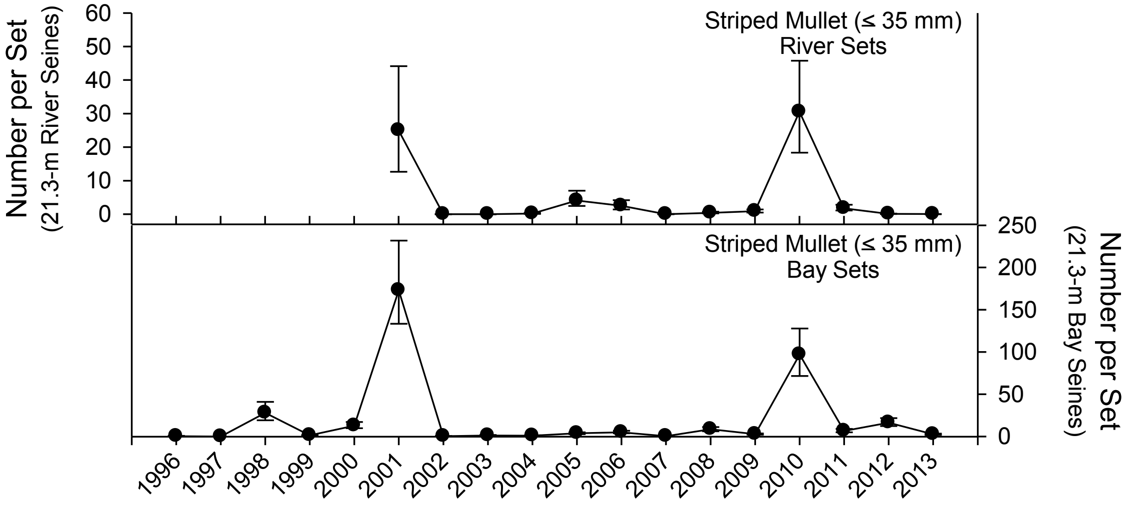


Figure SP13-07. (Continued) Relative abundance of young-of-the-year Striped Mullet (≤ 35 mm SL) collected in 21.3-m seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems.

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Pinfish, *Lagodon rhomboides*

Pinfish, *Lagodon rhomboides*, is an ecologically and recreationally important sparid found in marine and estuarine waters from Massachusetts to Texas (Bigelow and Schroeder 1953; Caldwell 1957). It is one of the most abundant resident species in estuaries of the northeastern Gulf of Mexico (Hoese and Jones 1963; Hansen 1970; Ogren and Brusher 1977). Densities of Pinfish have been found to be positively correlated to seagrass and drift algae cover (Rydene and Matheson 2003). Studies have shown that predation by Pinfish plays a role in the organization of seagrass macro benthic faunal assemblages (Young et al. 1976; Young and Young 1977). The Pinfish is also a major link between primary and secondary production as individuals >60 mm standard length (SL) consume and digest seagrasses and encrusting epiphytes (Stoner 1980; Weinstein et al. 1982; Montgomery and Targett 1992). Pinfish of all sizes are commonly targeted by anglers for use as bait when fishing for recreationally important species such as Sailfish (*Istiophorus platypterus*), Red Drum (*Sciaenops ocellatus*), Spotted Seatrout (*Cynoscion nebulosus*), Southern Flounder (*Paralichthys lethostigma*), Common Snook (*Centropomus undecimalis*), and Gag (*Mycteroperca microlepis*).

To monitor year-class strength and improve the ability to predict future Pinfish abundances, relative indices of abundance (IOAs) were developed for young-of-the-year (YOY) Pinfish recruitment into selected Florida estuaries. Abundance data for YOY Pinfish ≤ 80 mm SL that were collected in stratified-random 21.3-m seine samples were examined to assess recruitment into six Florida estuaries: (in order of sampling inception) Tampa Bay, Charlotte Harbor, northern Indian River Lagoon (IRL), Cedar Key, Apalachicola Bay, and northeast Florida. Young-of-the-year Pinfish recruited to habitats sampled with 21.3-m seines primarily from January through June and IOAs were calculated using catch data from these months only. This time period coincides with the published recruitment period for this species (Nelson 1998). The maximum size that individuals of YOY cohorts attain by June is 80 mm SL (Nelson 1998). Indices of abundance for YOY Pinfish were not calculated for the southern IRL where 21.3-m seines were not included as a sampling gear. Due to historical changes in sampling design, only consistently-sampled zones in each estuary were included to generate annual IOAs. The FIM program also monitored the abundance of larger Pinfish within these same Florida estuarine systems (including the southern IRL). Data from stratified-random 183-m haul seines were used to develop IOAs for subadult and adult fish (≥100 mm SL) collected between January and December. All IOAs were calculated using data beginning in 1996, however estuaries varied in the specific time period sampled.

Annual IOAs of YOY Pinfish in Tampa Bay and Charlotte Harbor generally had similar trends, although relative abundance was higher in Charlotte Harbor (Figure SP13-08). In Tampa Bay, IOAs of YOY Pinfish in riverine and bay habitats indicated similar patterns of recruitment. In each habitat strong year classes occurred in 2001 and 2010 and poor year classes occurred in 2005, 2006, and 2012. In Charlotte Harbor, a pattern similar to what was observed in Tampa Bay was evident with stronger year classes in 2001, 2004, 2010, and 2011, and poor year classes during 2005, 2006, and 2012. In general, sub-adult and adult Pinfish showed an increase in abundance beginning in 2007 and peaking in 2012. A similar pattern was observed in sub-adult and adult Pinfish in Charlotte Harbor, although there was more year to year variability in the IOAs.

Annual IOAs of Pinfish on the northwest coast of Florida (Apalachicola Bay and Cedar Key) have had similar trends over time (Figure SP13-08). Annual IOAs of YOY Pinfish in bay habitats in Apalachicola Bay were low between 1998 and 1999 and have remained at higher but variable levels since. Strong year classes were evident in 2001, 2002, 2007, and 2009 followed by a general downward trend through 2013. In Cedar Key, annual IOAs were low in 1999 and 1998 followed by an increase in 2000. Subsequent to 2000, strong year classes were evident during a period of variable recruitment through 2009 followed by a general downward trend in both habitats with the exception of a strong year class in 2011 in riverine habitats. The trend of annual IOAs of sub-adult and adult Pinfish in Apalachicola Bay remained stable from 1997-2013, but with peaks occurring in 2003, 2007, and 2010. In Cedar Key, annual IOAs for sub-adult and adult Pinfish were variable, indicating an overall declining trend for the entire time series (1997-2013), however large abundances were observed in 2002, 2004, 2007, and 2011.

Annual IOAs on the east coast of Florida differed by estuary (Figure SP13-08). Annual IOAs of YOY Pinfish in northeast Florida varied without trend from 2001-2009 followed by strong year classes in 2010, 2011, and 2013. Annual IOAs of sub-adult and adult Pinfish in northeast Florida have tracked well with YOY abundances since 2004, except for the most recent years IOA. In the northern IRL, annual IOAs of YOY Pinfish have remained stable at low levels with the exception of strong year classes in 1998, 2004, and 2010. Annual IOAs of sub-adult and adult Pinfish in the northern IRL varied without trend throughout most of the time period with the exception of extremely high abundance in 2004 and 2011. Annual IOAs of sub-adult and adult Pinfish in the southern IRL have remained stable at low levels.

Length-frequency data collected across all years sampled with 183-m haul seines indicate that this gear provides valuable information on sub-adult and adult Pinfish (Figure SP13-09). Length-frequency distributions were generally unimodal in Tampa Bay, Charlotte Harbor, Cedar key, northeast Florida, and the northern IRL, while in Apalachicola Bay and southern IRL distributions were bimodal. Sub-adult and adult Pinfish began to become susceptible to capture in 183-m haul seines at ~50 mm SL. The peak size in most of the length frequency histograms was ~75-80 mm SL, except in northern IRL where the largest proportion of fish captured were ~120-125 mm SL.

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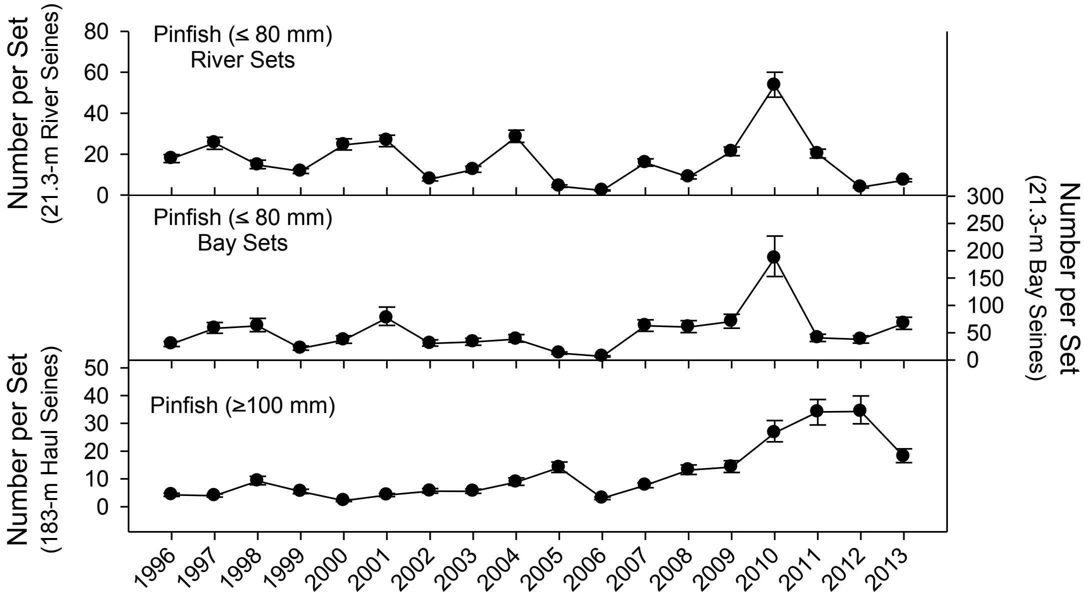
Tampa Bay



Charlotte Harbor

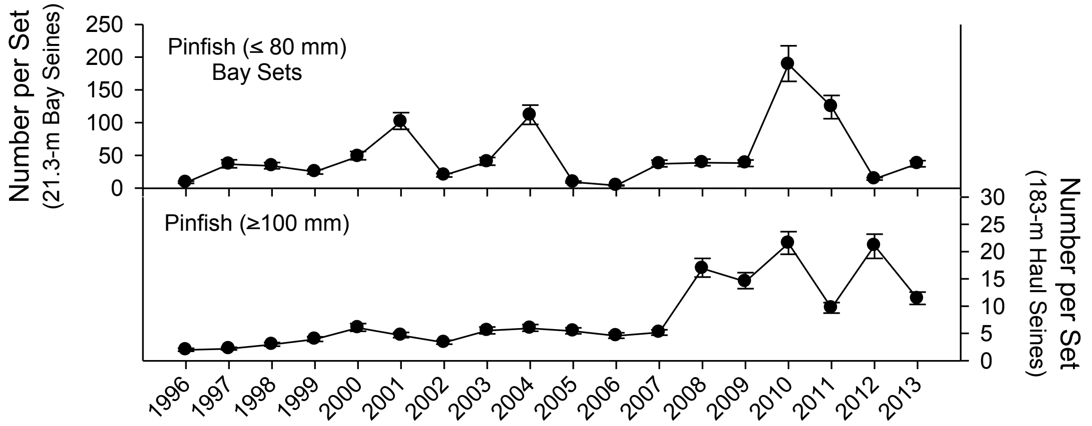
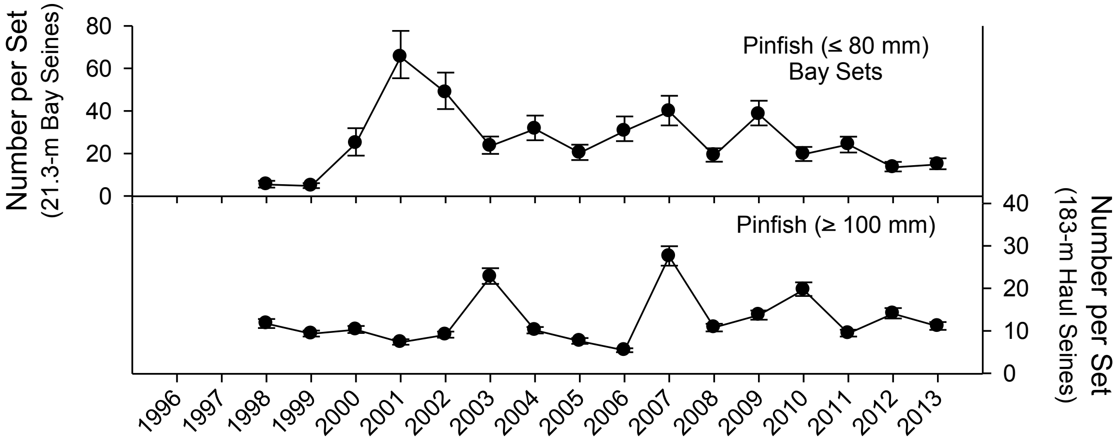


Figure SP13-08. Relative abundance of young-of-the-year Pinfish (≤ 80 mm SL) collected in 21.3-m seines and of sub-adult/adult Pinfish (≥ 100 mm SL) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems. In some instances, where sufficient numbers of individuals were captured, separate plots for riverine and bay habitats were created to examine differences in recruitment. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gears and estuaries.

Apalachicola Bay



Cedar Key

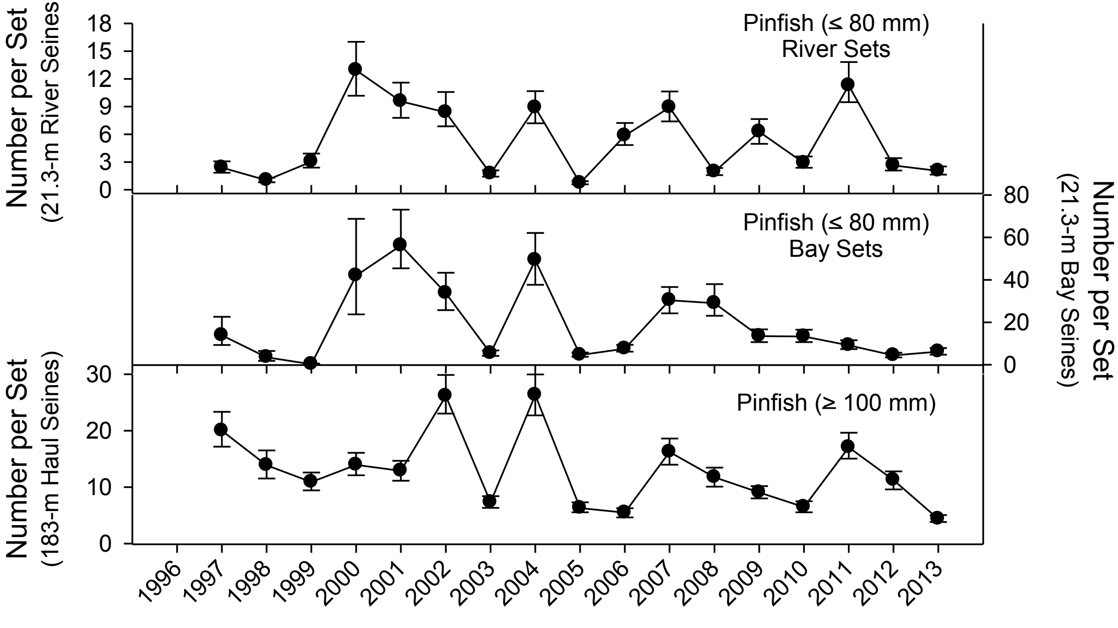
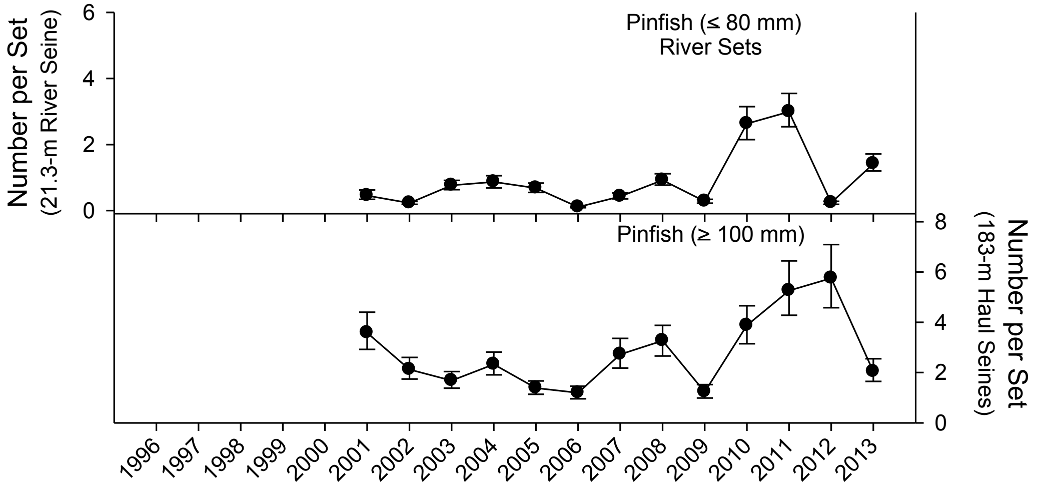


Figure SP13-08. (Continued) Relative abundance of young-of-the-year Pinfish (≤ 80 mm SL) collected in 21.3-m seines and of sub-adult/adult Pinfish (≥ 100 mm SL) collected in 183-m haul seines between 1997 and 2013 during stratified-random sampling from six Florida estuarine systems.

Northeast Florida



Indian River Lagoon

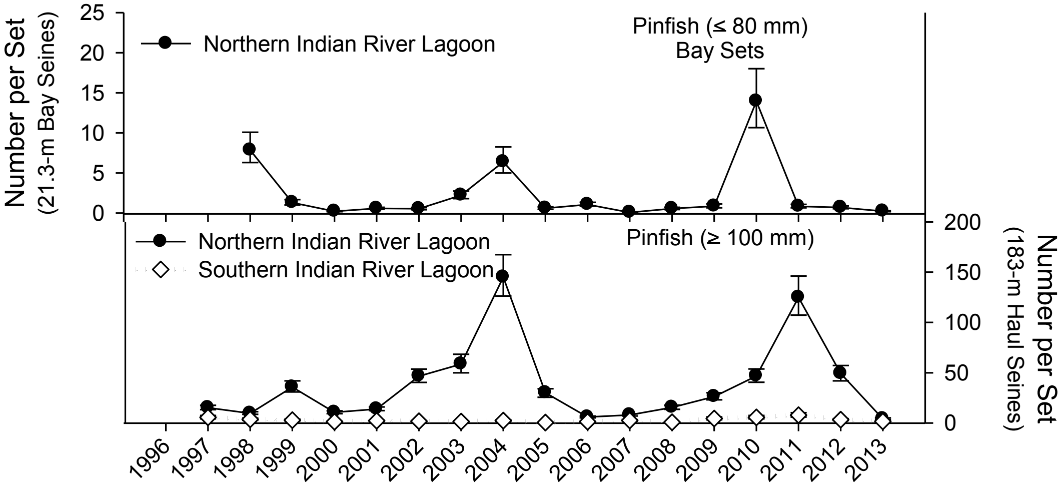


Figure SP13-08. (Continued) Relative abundance of young-of-the-year Pinfish (≤ 80 mm SL) collected in 21.3-m seines and of sub-adult/adult Pinfish (≥ 100 mm SL) collected in 183-m haul seines between 1997 and 2013 during stratified-random sampling from six Florida estuarine systems.

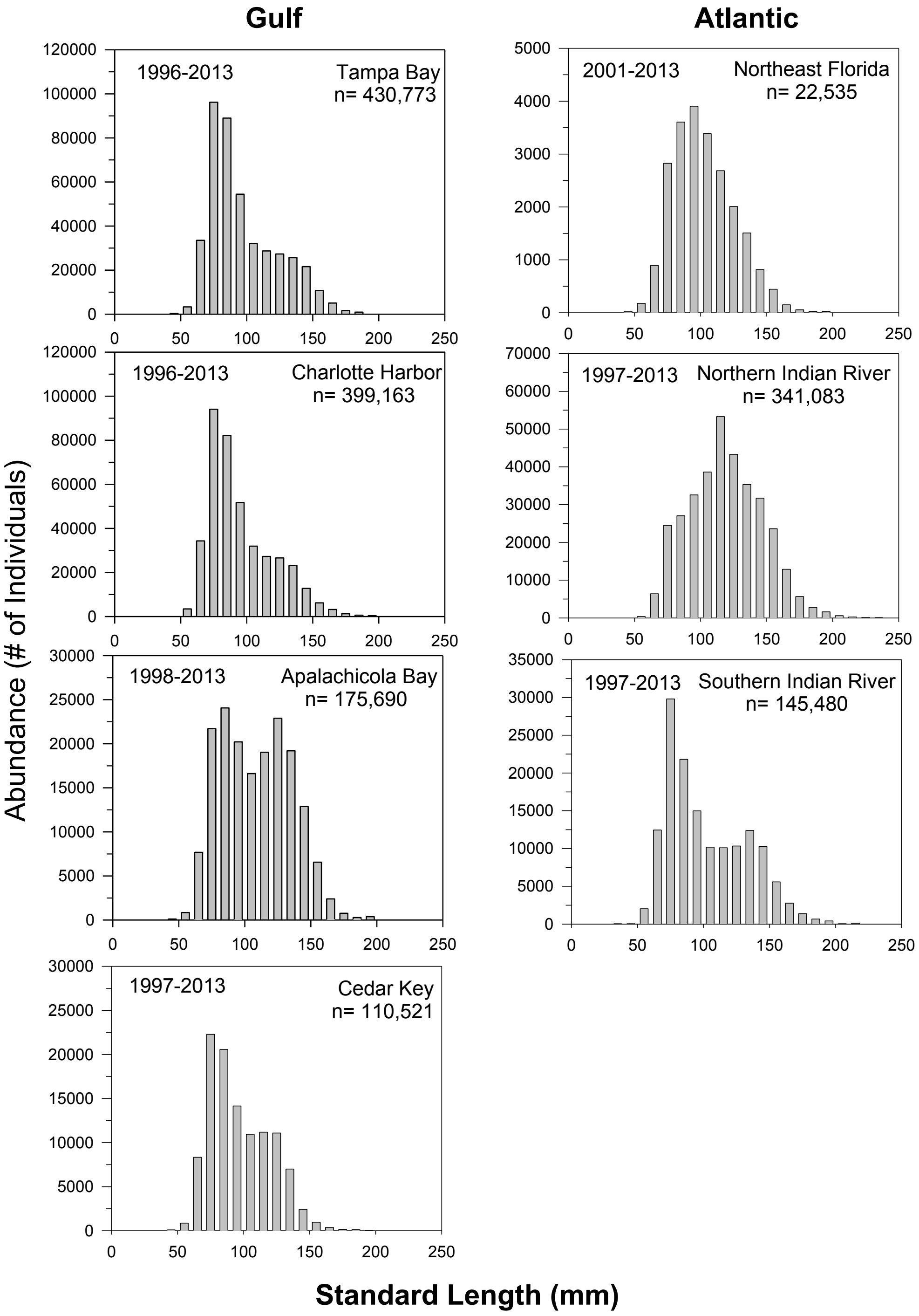


Figure SP13-09. Length frequency diagrams of Pinfish collected in 183-m haul seines. All lengths are standard length (SL). Note different scales and years of collection.

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Common Snook, *Centropomus undecimalis*

Common Snook, *Centropomus undecimalis*, are found in estuaries, adjacent rivers, and in nearshore waters of the tropical and subtropical western Atlantic and Gulf of Mexico (Gilmore et al. 1983; Rivas 1986; Winner et al. 2010). This species supports an important recreational fishery in Florida and is one of the most popular gamefish in state waters. There has been no legal commercial harvest of Common Snook in Florida since the State Legislature declared it a gamefish in 1957 and prohibited its sale. The median total Common Snook harvest on the Atlantic and Gulf of Mexico (Gulf) coasts during the past 20 years has been variable, but generally increasing (Muller and Taylor 2006). Recent estimates of transitional spawning potential ratios were below 40% on both coasts, and Common Snook are therefore considered overfished; if current fishing mortality rates continue, this species will remain overfished. In response to cold-weather fish kills that occurred statewide during 2010, the FWC issued executive orders that prohibited the harvest of Common Snook through August 31, 2010, and subsequent executive orders extended the closure through August 31, 2011 (State of Florida Executive Order No. E0 10-45). At the June 2011 Florida Fish and Wildlife Conservation Commission Meeting, Commissioners concluded that the Atlantic coast stock was less severely impacted by cold weather than the Gulf coast. Based on this information, the Commissioners ruled to reopen Common Snook harvest on September 1, 2011 in Atlantic waters, but Gulf coast waters remained closed through August 31, 2013.

In Florida, Common Snook populations from the Atlantic and Gulf coasts have been genetically identified as separate stocks and are managed separately (Tringali and Bert 1996; Taylor et al. 1993). Histological evidence shows that Common Snook are protandric hermaphrodites, i.e., they begin life as males and some become females after maturation (Taylor et al. 2000). Males typically become sexually mature at ~200 mm standard length (SL) and females at ~680 mm SL. The reproductive season for Common Snook extends at least six months; April through September on the Gulf coast and April through October on the Atlantic coast (Taylor et al. 1998).

In an effort to monitor year-class strength and to improve the ability to predict future adult Common Snook abundances, the FIM program developed relative indices of abundance (IOAs) of young-of-the-year (YOY) Common Snook recruitment into selected Florida estuaries. Indices were not calculated for estuaries where 21.3-m seines were not deployed or where limited data were available. Abundance data for YOY Common Snook ≤ 50 mm SL collected in stratified-random 21.3-m seine samples were examined to assess recruitment into two Florida estuaries: Tampa Bay on the Gulf coast and the northern Indian River Lagoon (IRL) on the Atlantic coast. Although collected in limited numbers throughout the year, YOY Common Snook were primarily captured in riverine habitats sampled with 21.3-m seines from August through November in Tampa Bay and July through February in the northern IRL. Only data from this habitat and these primary time periods were used in developing IOAs for YOY Common Snook.

The FIM program also monitored the relative abundances of large juvenile and adult Common Snook in Florida estuaries within the range of this species. Individuals between 200 mm and 609 mm SL were included in the IOA since they are considered reproductively mature males and serve as a “pre-recruitment” indicator to the fishery. The upper limit of 609 mm SL used in this IOA corresponds to the lower regulatory minimum size of 711 mm total length (TL). Data from stratified-random 183-m haul seines were used to develop IOAs for reproductively mature Common Snook within Tampa Bay, Charlotte Harbor, northern IRL, and southern IRL. These IOAs were derived by including all Common Snook between 200-609 mm SL collected between January and December from 1996–2013.

Annual IOAs of YOY Common Snook in Tampa Bay have been fairly stable, albeit low, between 1996 and 2013 with strong year classes evident in 1999, 2012, and 2013 (Figure SP13-10). Annual IOAs of pre-fishery adult Common Snook (200-609 mm SL) on Florida’s west coast varied within each estuary. In Tampa Bay Common Snook relative abundance was fairly stable from 1996 through 2007, followed by a slight peak in 2008. A decline in abundance was evident in 2009 with abundance remaining low through 2012 before increasing in 2013. Annual IOAs of pre-fishery adult Common Snook in Charlotte Harbor remained stable from 1996 through 2008, with slight peaks in 2001 and 2005. After a decline in the IOAs of pre-fishery adult Common Snook in 2010, abundances increased from 2011 through 2013 (Figure SP13-10).

Annual IOAs of YOY Common Snook in northern IRL have fluctuated substantially since 2001 (Figure SP13-10). Abundance peaked in 2002 followed by a sharp decline through 2004, substantially lower than any years prior or since. This year of extremely low recruitment may have resulted from displacement due to multiple hurricanes and not an actual decrease in abundance in this estuarine system. Young-of-the-year recruitment increased after 2004 with a strong recruitment peak the following year, followed by three years of average abundance. In 2009 and 2010 there was another sharp decline followed by increasing abundance from 2011 through 2013. Annual IOAs of pre-fishery adult Common Snook (200-609 mm SL) remained stable from 1997 through 2008 in the northern IRL with small peaks in 1998, 2004, and 2008. Abundance in the northern IRL declined sharply from 2009 through 2011 and increased slightly in 2012 and 2013. Annual IOAs of pre-fishery adult Common Snook in the southern IRL were high from 1997-1999, began to decline in 2000, and remained fairly stable from 2002 through 2009; however, as was observed in the other estuaries analyzed, abundance decreased substantially in 2010 (e.g., cold kill event), remained low through 2011, and increased slightly in 2012 and 2013 (Figure SP13-10).

Length-frequency data collected with 183-m haul seines indicate that this gear provides valuable information on larger juvenile and adult Common Snook (Figure SP13-11). Length-frequency distributions were unimodal with a peak in distribution at 380-500 mm SL. There was no indication that the number of individuals declined rapidly upon entering the legal slot-limit (609-699 mm SL on the Gulf coast and 609-677 mm SL on the Atlantic coast).

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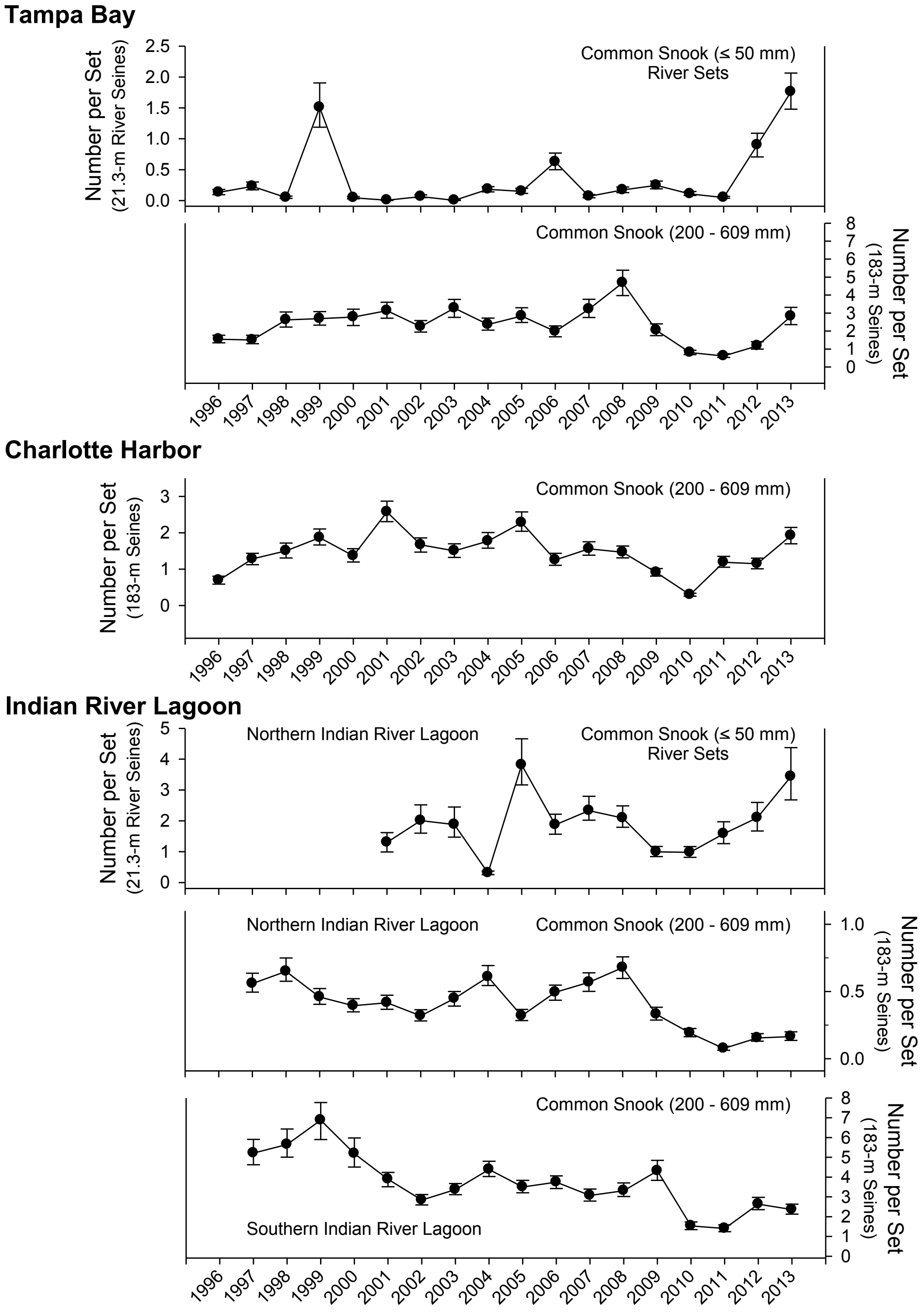

Figure SP13-10. Relative abundance of young-of-the-year Common Snook (≤ 50 mm SL) collected in 21.3-m seines and pre-fishery adult Common Snook (200 - 609 mm SL) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from three Florida estuarine systems. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gears and estuaries.

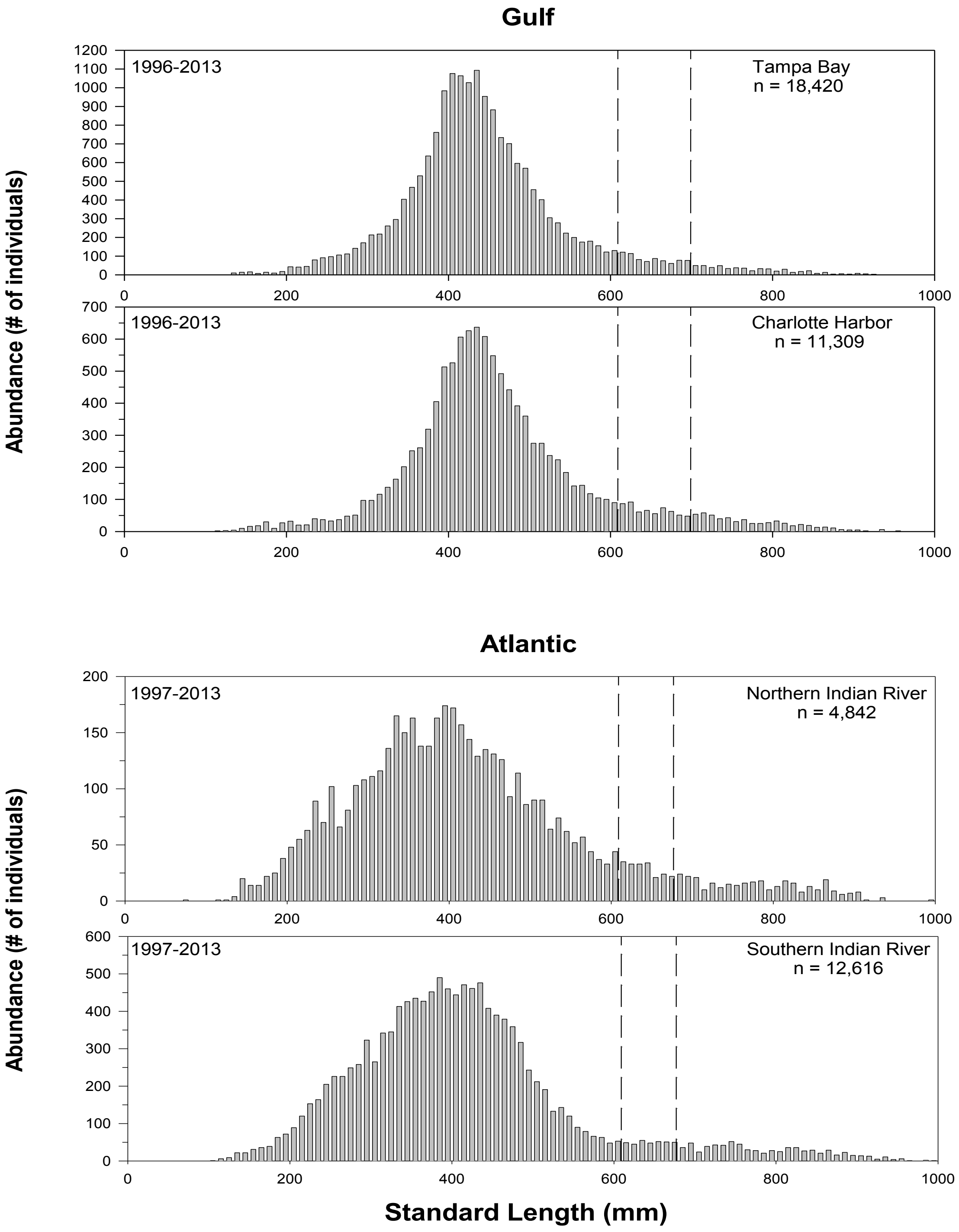

Figure SP13-11. Length frequency diagrams of sub-adult and adult Common Snook collected in 183-m haul seines. All lengths are standard length (SL). Vertical dashed lines denote the recreational slot limit for this species (609 to 699 mm SL on the Gulf coast and 609 to 677 mm SL on the Atlantic coast). Note different scales and years of collection.

Blue Crab, *Callinectes sapidus*

Blue Crab, *Callinectes sapidus*, supports valuable commercial and recreational fisheries along the Gulf of Mexico (Gulf) and Atlantic coasts of Florida. From 1996 to 2012, commercial landings on Florida's Gulf and Atlantic coasts averaged 7.2 and 3.5 million pounds per year and were worth an estimated 6.3 and 3.9 million dollars, respectively (NMFS 2014). Florida legislation banned entanglement nets in 1995, raising the concern that Blue Crab populations might experience increased fishing pressure from former net fishers. Even though annual commercial landings in the Gulf peaked in 1998 at almost 13 million pounds, catch-per-unit effort was already beginning to decline (Steele and Bert 1998). Landings have decreased over the years, with the lowest commercial landings of Blue Crab occurring in 2008 for the Gulf coast and 2009 for the Atlantic coast (NMFS 2014). Commercial fishing effort for Blue Crab has been limited in recent years by restricted species permits although there are no quotas for Blue Crab landings. The annual recreational harvest of Blue Crab is not currently known or surveyed, so the total catch may be much higher than the recorded commercial landings. The most recent Blue Crab stock assessment for Florida shows an increase in abundance in recent years (2003-2005), indicating resiliency to fishing pressure (Murphy et al. 2007).

Blue Crabs are an integral part of estuarine ecosystems in Florida, whether scavenging carrion or preying upon young-of-the-year (YOY) fishes, mollusks, and crustaceans. They play a valuable role in controlling populations of other estuarine species. In areas with depleted Blue Crab populations, mollusks that graze on *Spartina alterniflora* can become overpopulated and contribute to salt marsh die-offs (Sillman and Bertness 2002). Blue Crab are prey for important sportfish species such as Black Drum (Simmons and Breuer 1962), Red Drum (Gunter 1945; Scharf and Schlicht 2000), Common Snook (Blewett et al. 2006), and Cobia (Meyer and Franks 1996). In addition to predation and harvest by humans, Blue Crab populations are affected by a myriad of other factors such as freshwater inflows (Wilber 1994, Flaherty and Guenther 2011), pesticides, disease, and habitat alteration. Spawning in Florida generally occurs from

March through October with some limited spawning reported during winter months (Steele and Bert 1994).

To monitor year-class strength and improve the ability to predict future adult Blue Crab abundances, relative indices of abundance (IOAs) were developed for YOY Blue Crab recruitment from selected Florida estuaries. Abundance data for YOY Blue Crab (≤ 80 mm carapace width [CW]; Archambault et al. 1990; Steele and Bert 1994) collected in stratified-random 21.3-m seine samples were examined to assess recruitment into six Florida estuaries: (in order of inception) Tampa Bay, Charlotte Harbor, northern Indian River Lagoon (IRL), Cedar Key, Apalachicola Bay, and Northeast Florida. Young-of-the-year Blue Crabs were collected with 21.3-m seines during all months, but length-frequency histograms indicate they were primarily collected from August through March. These months were therefore used to define the respective recruitment seasons for each estuary in subsequent analyses. Data collected from August through December of each year were combined with data from January through March of the following year to create a biological year of data. The IOA for 2013 therefore only included data from August through December 2013. Indices of abundance of YOY Blue Crab were not calculated for the southern IRL where 21.3-m seines were not included as a sampling gear. Although sampling with 21.3-m seines began earlier in northern IRL, YOY Blue Crab IOAs were only calculated for data after 1997 for bay seines and 2000 for river seines, at which time Zones H and F were added, respectively, and yielded adequate numbers of YOY Blue Crab for analyses.

The FIM program also monitored the abundance of adult Blue Crab (>80 mm CW) within these same Florida estuaries (including southern IRL) using stratified-random 183-m haul seines. Note, however, that some individuals classified as adults (>80 mm CW) may still have been reproductively immature as a result of individual variation in growth rates and timing of maturity (Archambault et al. 1990; Steele and Bert 1994).

Annual IOAs of YOY Blue Crab in riverine and bay habitats of Tampa Bay have been relatively stable since 1996 with a few pronounced strong year classes (Figure SP13-13). Within Tampa Bay riverine habitats, increases in abundance were evident from 1998-2000, 2006, and 2010. In bay habitats of Tampa Bay, IOAs of YOY Blue Crab were greatest in 1998, 2003, 2010, and 2012. Annual IOAs of YOY Blue Crab in Charlotte Harbor indicated an exceptional year class in 1998 for riverine habitats and strong year classes in 1998 and 2003 in bay habitats. Annual IOAs of adult Blue Crab in Tampa Bay peaked in 1996 and 1998 although slight increases in abundance were apparent in 2006 and 2010-2011. Adult Blue Crab abundance in Charlotte Harbor follows a similar pattern with a large peak in 1998-1999 and increased abundance in 2006 and 2010-2011.

The trends in annual IOAs of Blue Crab on Florida's northwest coast varied between estuaries (Figure SP13-13). Annual IOAs of YOY Blue Crab in riverine habitats of Apalachicola Bay were relatively stable with a peak in abundance occurring in 2000 and 2006. While YOY IOAs from bay habitats in this system were consistently lower than those in riverine habits, within bay habitats higher abundances were evident during the periods between 2003-2006 and 2009-2010. Annual IOAs of adult Blue Crab in Apalachicola Bay decreased from 1998 through 2004, and have remained relatively stable since with the exception of increased abundance in 2006 and 2009-2010. In Cedar Key, IOAs of YOY Blue Crab in riverine habitats increased from 1997 through 1999 and, after declining steadily through 2004, have since returned to lower but stable levels. Young-of-the-year indices from Cedar Key bay habitats increased until 1998, declined steadily through 2005, increased again in 2006 and, like in river habitats, have returned to lower but stable levels. Annual IOAs of adult Blue Crab in Cedar Key were generally low with peaks in abundance in 1998, 2004-2007, and 2010-2011.

Annual IOAs of Blue Crab on Florida's east coast varied by estuary and year (Figure SP13-13). Annual IOAs of YOY Blue Crab in Northeast Florida increased in 2003, declined steadily through 2009, increased to a peak in 2011, and then began a decline that continued though 2013. Annual IOAs of adult Blue Crab while lower in abundance were also variable with a peak in abundance occurring in 2007-2008. Trends in YOY IOAs did not correlate well with adult abundance in Northeast Florida with the exception of 2011. Annual IOAs of YOY Blue Crab in riverine portions of the northern IRL increased throughout the time series, but relatively weak year classes were evident in 2001, 2004, 2012, and 2013. Young-of-the-year IOAs from bay habitats were relatively stable throughout the time series with elevated abundances in 1999 and 2007. Annual IOAs for adult Blue Crab in the southern and northern IRL were relatively low but stable with a peak in abundance occurring in 2005 in the northern IRL and in 2006 in the southern IRL. Trends in YOY abundance did not correlated well with adult abundance in the northern IRL.

Length-frequency data collected with 183-m haul seines indicate that this gear provides valuable information on adult Blue Crab in Florida estuaries (Figure SP13-14). Length-frequency distributions for Tampa Bay, Charlotte Harbor, and northern IRL were unimodal with the primary range of Blue Crab sizes between ~70-150 mm CW, while in Cedar Key, the distribution favored smaller Blue Crab (~50-70 mm CW). The size distributions for Apalachicola Bay, Northeast Florida, and southern IRL were similar but bimodal with modes occurring at ~50-70 mm CW and ~120-150 mm CW.

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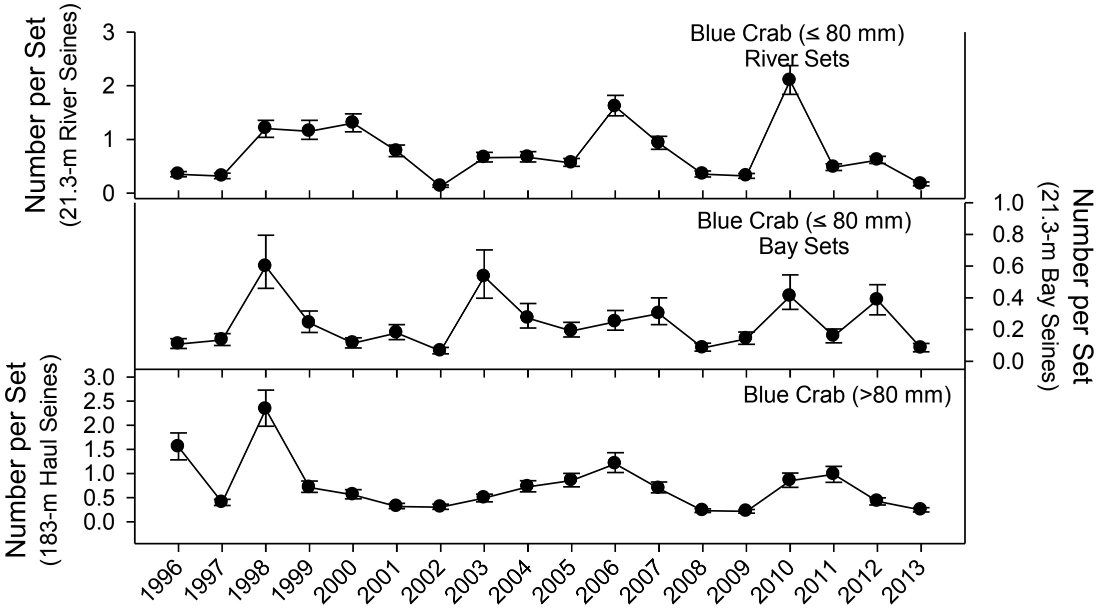
Tampa Bay



Charlotte Harbor

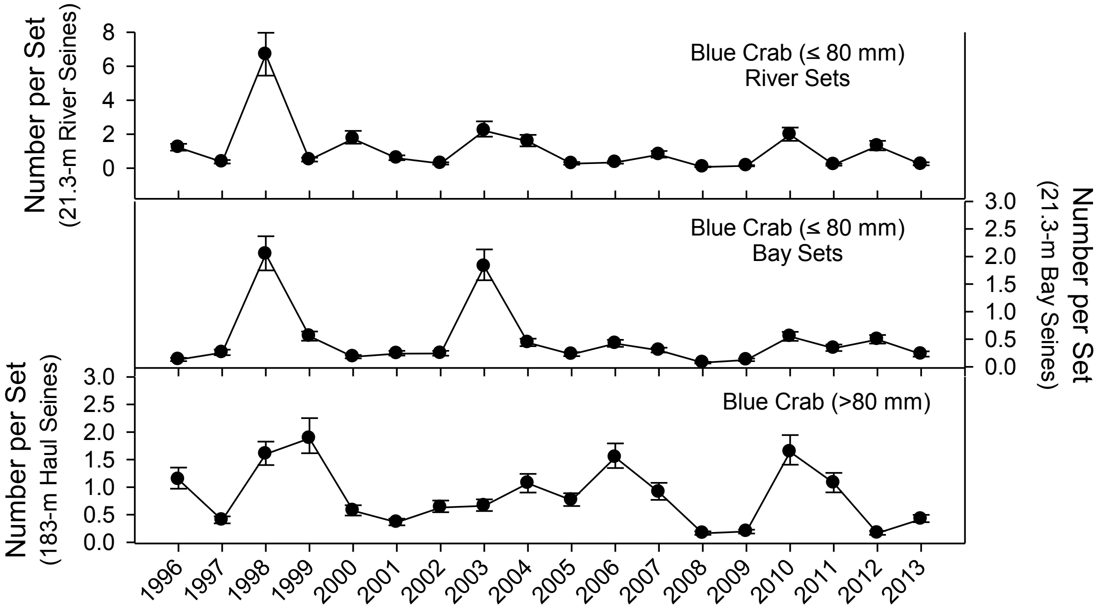
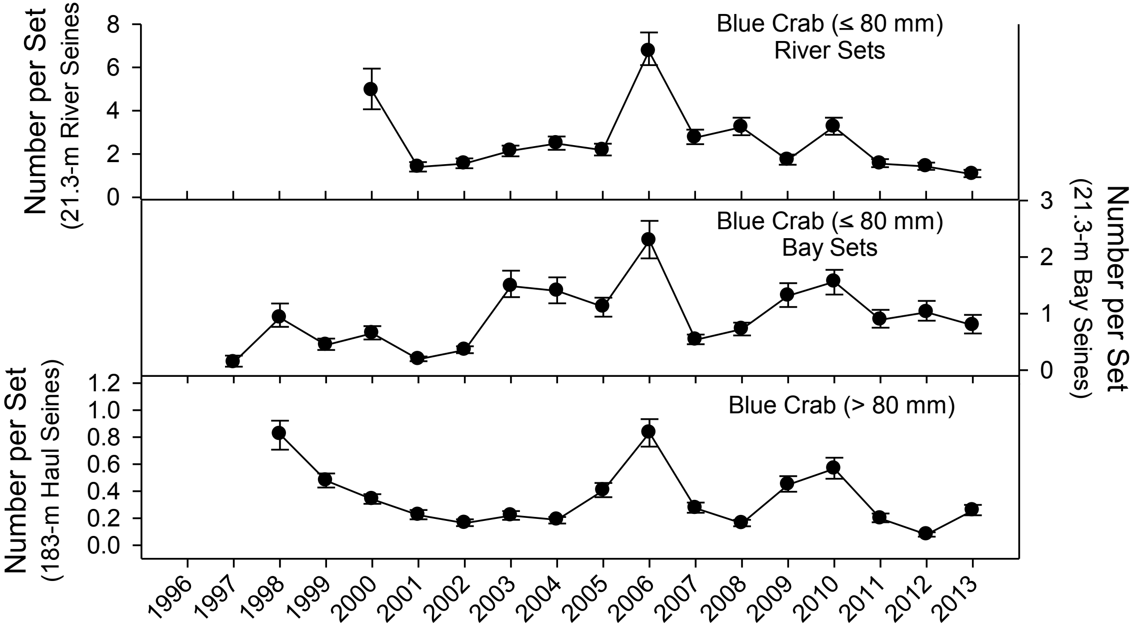


Figure SP13-13. Relative abundance of young-of-the-year Blue Crab (≤ 80 mm CW) collected in 21.3-m seines and of adult Blue Crab (> 80 mm CW) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems. In some instances, where sufficient numbers of individuals were captured, separate plots for river and bay sets were created to examine differences in recruitment between the two habitats. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales in some cases for estimates from 21.3-m and 183-m seines.

Apalachicola Bay



Cedar Key

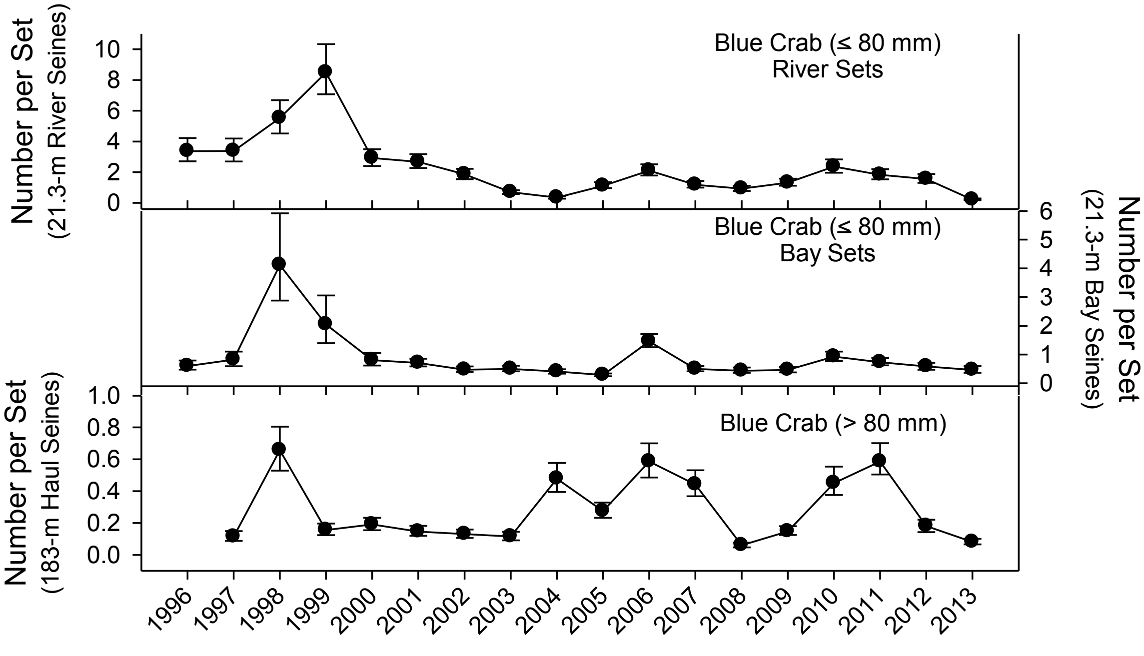
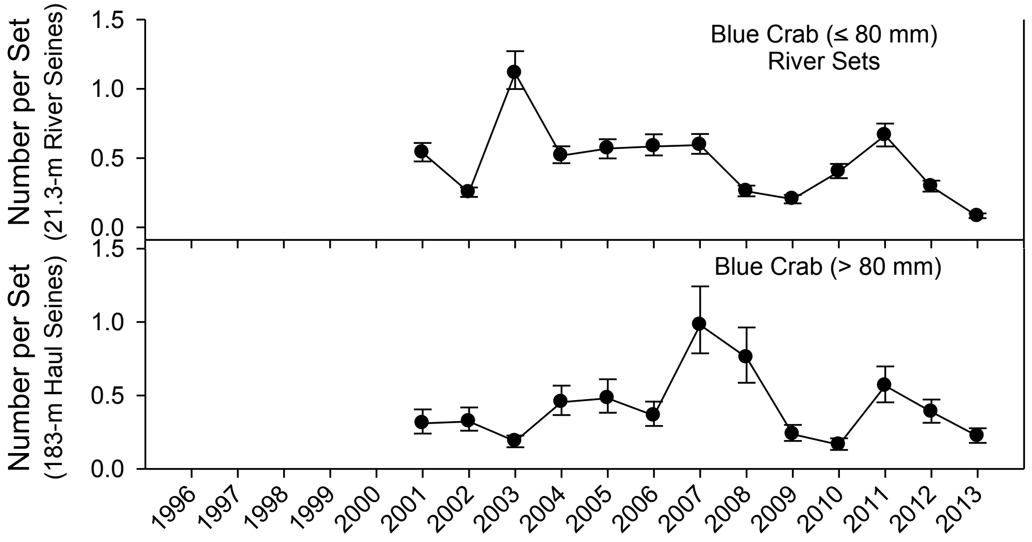


Figure SP13-13. (Continued) Relative abundance of young-of-the-year Blue Crab (≤ 80 mm CW) collected in 21.3-m seines and of adult Blue Crab (> 80 mm CW) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems.

Northeast Florida



Indian River Lagoon

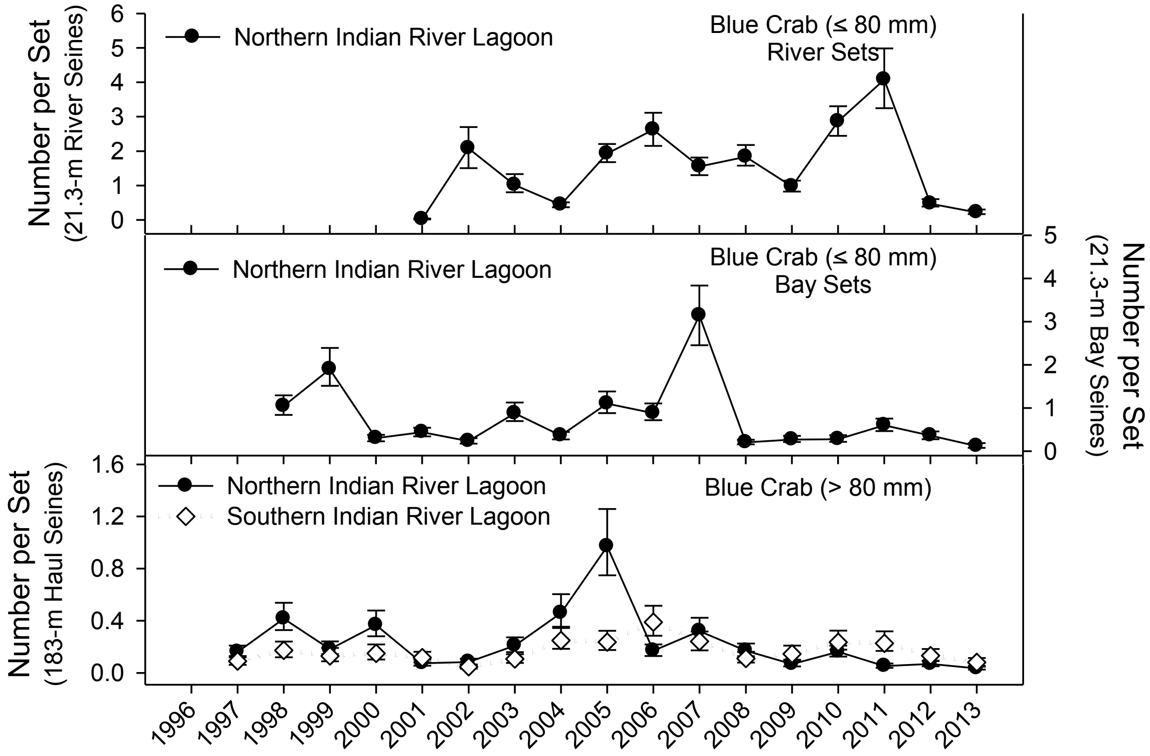


Figure SP13-13. (Continued) Relative abundance of young-of-the-year Blue Crab (≤ 80 mm CW) collected in 21.3-m seines and of adult Blue Crab (> 80 mm CW) collected in 183-m haul seines between 1996 and 2013 during stratified-random sampling from six Florida estuarine systems.

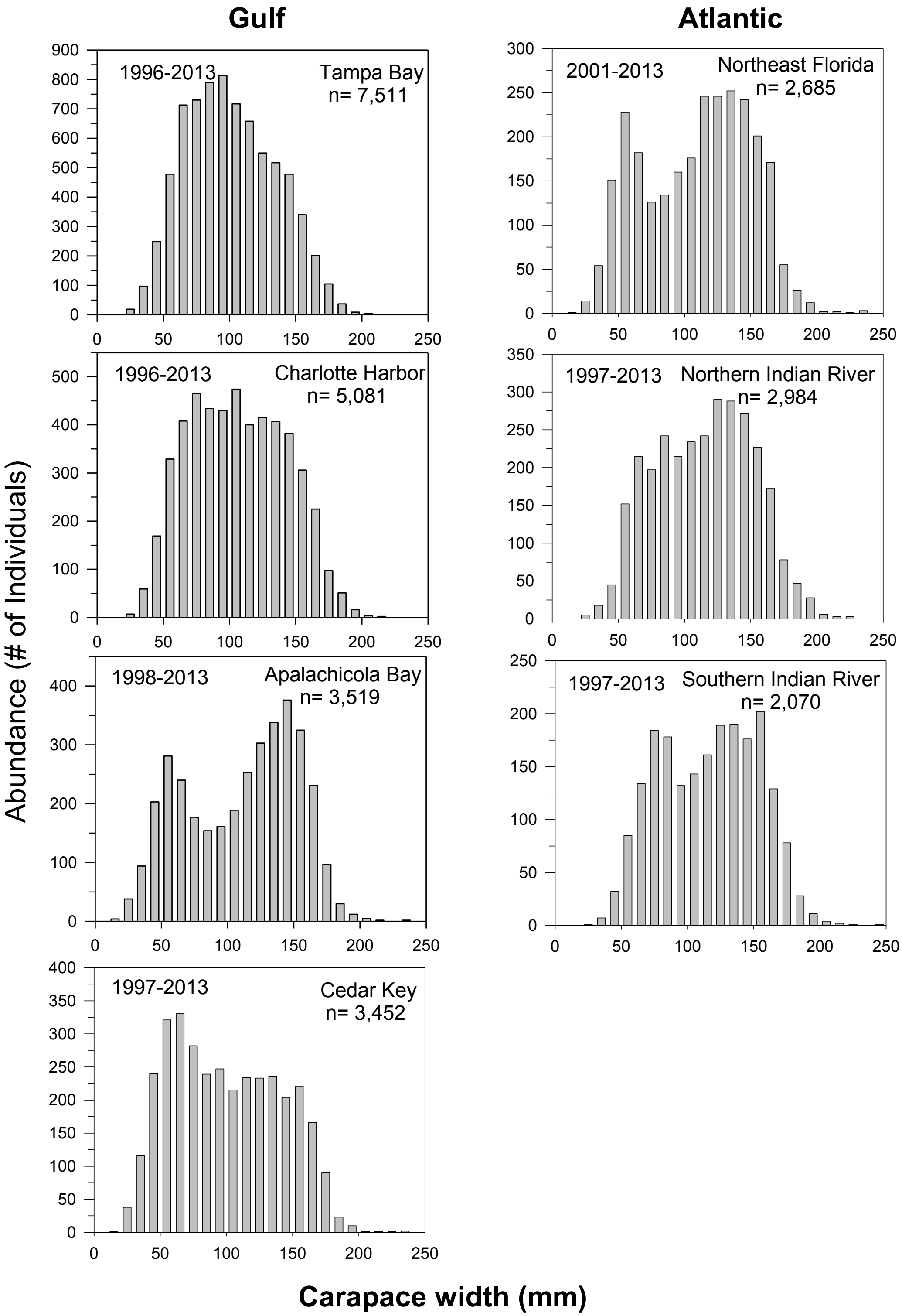


Figure SP13-14. Length frequency diagrams of Blue Crab collected in 183-m haul seines. All lengths are carapace width (CW). Note different scales and years of collection.