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Florida Fish and Wildlife Conservation Commission

Florida Marine Research Institute

Fisheries-Independent Monitoring Program 2002 Annual Data Summary Report

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Overview

This report provides a summary of the data collected in 2002 by the FWC/FMRI Fisheries-Independent Monitoring (FIM) program, which completed its thirteenth year of sampling in Florida waters. Monitoring was conducted monthly using 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, the Florida Keys, and northeast Florida. Gears used for routine monitoring at the various areas included 21.3-m seines, 6.1-m otter trawls, 183-m haul seines, and 183-m purse seines (Table OV02-01). In the Florida Keys, visual surveys were used to sample reeffish. Details of the sampling methods for the Florida Keys are discussed in this report (see Fisheries-Independent Monitoring and the Florida Keys sections).

There were 1,688,004 animals collected in 6,810 samples from all study areas (Figure OV02-01). The majority of animals (n=1,266,266) were collected in 21.3-m seines, which constituted 75.0% of the total catch. The majority of samples were collected with 21.3-m seines (n=2,615), followed by 183-m haul seines (n=1,466), visual surveys (n=1,172), 6.1-m otter trawls (n=1,146), and 183-m purse seines (n=490). Total sampling effort in each study area ranged from 192 to 1,240 samples, and the total number of animals collected within the study areas ranged from 23,371 to 562,055 (Table OV02-02).

In all study areas, net samples were dominated by bait and forage fishes such as *Anchoa mitchilli*, *Lagodon rhomboides*, *Menidia* spp., *Lucania parva*, *Leiostomus xanthurus* and *Eucinostomus* spp. (Table OV02-03). Recreationally and commercially important animals (i.e., Selected Taxa; see Table FIM02-02) accounted for 12.6% (n=216,224) of the overall FIM catch and comprised between 4.1 and 33.3% of the total net catches from each study area (Table OV02-03). Selected Taxa were very common in some areas when compared to dominant taxa—they were also among the ten most abundant taxa in some areas: *Farfantepenaeus duorarum* in Charlotte Harbor; *L. xanthurus* and *Micropogonias undulatus* in the northern Indian River Lagoon; *L. xanthurus* in Cedar Key; *Mugil curema, Archosargus probatocephalus*, *Mugil cephalus*, and *Centropomus undecimalis* in the southern Indian River Lagoon; *L. xanthurus*, *M.*

undulatus, *M. cephalus*, and *Cynoscion arenarius* in Apalachicola; *Lutjanus synagris* and *Lutjanus griseus* in the Florida Keys (trawls); and *M*. *cephalus* and *M*. *undulatus* in northeast Florida (Tables OV02-03 and –04). No selected species were among the ten most abundant taxa in Tampa Bay during 2002.

Seasonal directed sampling targeting *M. cephalus* was conducted during the winter (January-February) and fall (September-December) of 2002. Trammel nets were used to sample *M. cephalus* in Tampa Bay and Charlotte Harbor. During the 2002 season, 3,334 *M. cephalus* were collected (77 net sets) in Tampa Bay and 1,742 *M. cephalus* were collected (36 net sets) in Charlotte Harbor (see Directed Sampling section).

Fish health monitoring indicated that 170 fish (≥ 75 mm SL) were culled for analysis of external abnormalities (including parasites). Numbers of reported abnormalities from each study area ranged from 8 (Cedar Key) to 39 (Tampa Bay and Charlotte Harbor; see Fish Health section).

Species profiles, including indices of relative abundance, were created for several species, including *Sciaenops ocellatus* (red drum), *Cynoscion nebulosus* (spotted seatrout), *A. probatocephalus* (sheepshead), *M. cephalus* (striped mullet), *L. rhomboides* (pinfish), and *Callinectes sapidus* (blue crabs). Abundances were variable from year to year around generally stable long-term means (see Species Profile section).

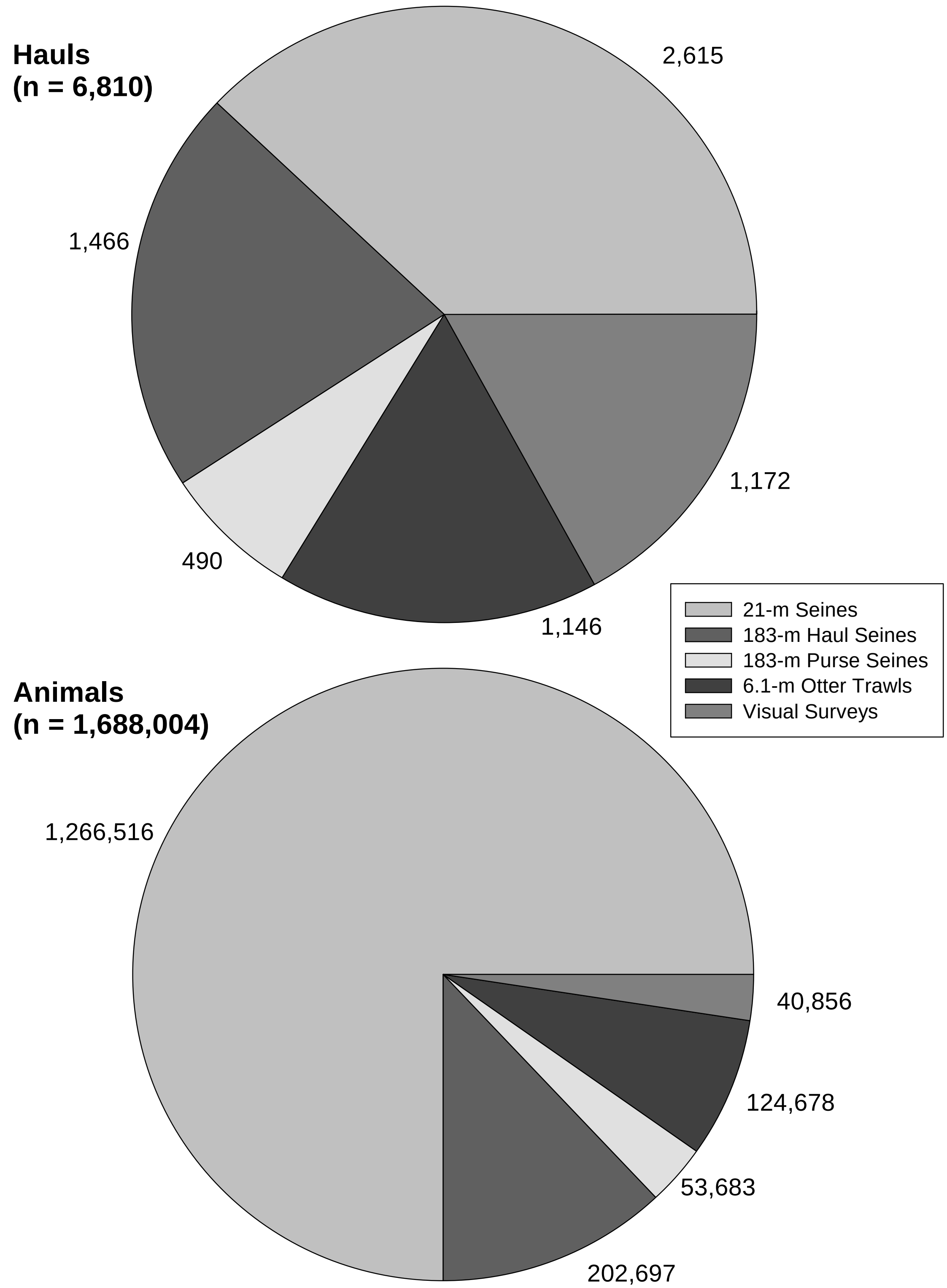

Figure OV02-01. Summary of catch and effort data during FIM program stratified-random sampling, 2002. ‘Hauls’ are the total number of deployments (or observations with visual surveys) by gear, and ‘Animals’ are the total number of animals collected (or observed) by each sampling method.

Table OV02-01. Gear usage by field laboratories for FIM program stratified-random sampling, 2002.

Field Lab	**21.3-m Seines**		**183-m**	**183-m**	**6.1-m**	**Visual**
	Bay	**River**	**Haul Seines**	**Purse Seines**	**Otter Trawls**	**Surveys**
Tampa Bay	X	X	X	X	X	
Charlotte Harbor	X	X	X	X	X	
N. Indian River	X	X	X			
Cedar Key	X	X	X		X	
Apalachicola	X	X	X		X	
S. Indian River			X			
Florida Keys					X[1]	X
Northeast Florida		X	X		X	

[1]Otter trawls were conducted at the Marathon Field Lab only during September and October 2002.

Table OV02-02. Summary of catch and effort data by area for FIM program stratified-random sampling, 2002. 'Hauls' are the total number of net deployments (or point counts with visual surveys) by each gear, and 'Animals' are the total number of animals collected (or observed) by each sampling method.

Gear	Tampa Bay		Charlotte Harbor	
	Hauls	Animals	Hauls	Animals
21.3-m seine	564	469,996	384	154,436
183-m haul seine	240	38,792	204	25,313
183-m purse seine	250	26,161	240	27,528
6.1-m otter trawl	186	27,106	90	10,063
Totals	**1,240**	**562,055**	**918**	**217,340**

Gear	N. Indian River Lagoon		Cedar Key	
	Hauls	Animals	Hauls	Animals
21.3-m seine	455	328,135	420	80,707
183-m haul seine	230	31,793	192	31,095
183-m purse seine	.	.	.	.
6.1-m otter trawl	.	.	180	22,317
Totals	**685**	**359,927**	**792**	**134,119**

Gear	S. Indian River Lagoon		Apalachicola Bay	
	Hauls	Animals	Hauls	Animals
21.3-m seine	.	.	408	85,023
183-m haul seine	192	23,371	216	34,657
183-m purse seine	.	.	.	.
6.1-m otter trawl	.	.	228	27,083
Totals	**192**	**23,371**	**852**	**146,597**

Table OV02-02. (Continued)

Gear	Florida Keys		Northeast Florida	
	Hauls/Observ.	**Animals**	**Hauls**	**Animals**
21.3-m seine	.	.	384	148,219
183-m haul seine	.	.	192	17,628
Visual surveys	1,172	40,856	.	.
6.1-m otter trawl	80	5,369	383	32,523
Totals	**1252**	**46,225**	**959**	**198,370**

Table OV02-03. Top 10 numerically dominant taxa collected in FIM program stratified-random sample areas, 2002.

Tampa Bay		Charlotte Harbor	
Scientific Name	**Number**	**Scientific Name**	**Number**
Anchoa mitchilli	339,708	*Lucania parva*	49,750
Menidia spp.	33,469	*Lagodon rhomboides*	34,286
Lagodon rhomboides	33,438	*Anchoa mitchilli*	29,018
Harengula jaguana	20,744	*Eucinostomus* spp.	24,885
Eucinostomus spp.	20,083	*Opisthonema oglinum*	14,792
Lucania parva	14,304	*Menidia* spp.	14,407
Anchoa hepsetus	11,425	*Eucinostomus gula*	5,362
Eucinostomus gula	8,631	*Microgobius gulosus*	4,588
Opisthonema oglinum	6,034	*Farfantepenaeus duorarum*	4,227
Bairdiella chrysoura	5,464	*Eucinostomus harengulus*	2,909
Total (dominant taxa)	**493,300**		**184,224**
Total (Selected Taxa)	**23,223**		**15,007**
Grand Total of Animals Collected	**562,055**		**217,340**

N. Indian River Lagoon		Cedar Key	
Scientific Name	**Number**	**Scientific Name**	**Number**
Anchoa mitchilli	186,405	*Anchoa mitchilli*	50,067
Lucania parva	31,898	*Lagodon rhomboides*	15,923
Lagodon rhomboides	18,710	*Bairdiella chrysoura*	13,071
Eucinostomus spp.	16,975	*Leiostomus xanthurus*	9,165
Leiostomus xanthurus	16,110	*Menidia* spp.	5,904
Brevoortia spp.	14,252	*Eucinostomus* spp.	4,875
Floridichthys carpio	11,371	*Membras martinica*	4,262
Diapterus auratus	9,245	*Harengula jaguana*	3,069
Menidia spp.	6,787	*Orthopristis chrysoptera*	2,373
Micropogonias undulatus	5,805	*Anchoa hepsetus*	2,537
Total (dominant taxa)	**317,558**		**111,246**
Total (Selected Taxa)	**34,165**		**17,798**
Grand Total of Animals Collected	**359,927**		**134,119**

Table OV02-03. (Continued)

S. Indian River Lagoon		Apalachicola Bay	
Scientific Name	**Number**	**Scientific Name**	**Number**
Lagodon rhomboides	8,871	*Anchoa mitchilli*	28,054
Diapterus auratus	4,429	*Leiostomus xanthurus*	26,389
Mugil curema	1,163	*Lagodon rhomboides*	20,221
Archosargus probatocephalus	816	*Brevoortia* spp.	7,696
Eucinostomus gula	757	*Harengula jaguana*	6,978
Mugil cephalus	606	*Menidia* spp.	6,875
Centropomus undecimalis	566	*Bairdiella chrysoura*	6,023
Harengula jaguana	451	*Micropogonias undulatus*	5,619
Brevoortia spp.	450	*Mugil cephalus*	5,493
Arius felis	398	*Cynoscion arenarius*	3,134
Total (dominant taxa)	**18,507**		**116,482**
Total (Selected Taxa)	**4,424**		**48,895**
Grand Total of Animals Collected	**23,371**		**146,597**

Florida Keys			
6.1-m Otter Trawls		**Visual surveys**	
Scientific Name	**Number**	**Scientific Name**	**Number**
Monacanthus ciliatus	941	*Haemulon plumieri*	8,343
Eucinostomus spp.	886	*Haemulon flavolineatum*	5,803
Haemulon plumieri	877	*Haemulon aurolineatum*	5,783
Lagodon rhomboides	742	*Haemulon sciurus*	5,275
Eucinostomus gula	671	*Ocyurus chrysurus*	3,440
Lutjanus synagris	169	*Haemulon* spp.	2,316
Calamus spp.	98	*Lutjanus griseus*	1,598
Nicholsina usta	81	*Haemulon chrysargyreum*	830
Lutjanus griseus	75	*Lachnolaimus maximus*	798
Lactophrys quadricornis	75	*Lutjanus apodus*	710
Total (dominant taxa)	**4,615**		**34,896**
Total (Selected Taxa)	**1,294**		**40,856**
Grand Total of Animals Collected	**5,369**		**40,856**

Table OV02-03. (Continued)

Northeast Florida	
Scientific Name	**Number**
Anchoa mitchilli	77,268
Menidia menidia	25,195
Anchoa hepsetus	21,852
Litopenaeus setiferus	9,436
Menidia spp.	8,880
Mugil cephalus	6,391
Brevoortia spp.	5,693
Fundulus heteroclitus	5,000
Micropogonias undulatus	4,896
Stellifer lanceolatus	4,676
Total (dominant taxa)	**169,287**
Total (Selected Taxa)	**30,562**
Grand Total of Animals Collected	**198,370**

Table OV02-04. Number of recreational or commercially important species (Selected Taxa) collected in the FIM program stratified-random sample areas, 2002. Florida Keys data represents Selected Taxa as well as Selected Reef Fish Taxa.

Tampa Bay		Charlotte Harbor	
Scientific Name	**Number**	**Scientific Name**	**Number**
Farfantepenaeus duorarum	5,129	*Farfantepenaeus duorarum*	4,227
Leiostomus xanthurus	4,120	*Cynoscion arenarius*	2,610
Elops saurus	3,770	*Mugil cephalus*	1,316
Centropomus undecimalis	1,647	*Centropomus undecimalis*	884
Mugil cephalus	1,638	*Elops saurus*	792
Menticirrhus americanus	1,193	*Sciaenops ocellatus*	717
Sciaenops ocellatus	1,191	*Menticirrhus americanus*	678
Cynoscion arenarius	1,189	*Cynoscion nebulosus*	670
Cynoscion nebulosus	850	*Archosargus probatocephalus*	617
Callinectes sapidus	712	*Lutjanus griseus*	567
Archosargus probatocephalus	431	*Callinectes sapidus*	399
Mugil gyrans	343	*Mycteroperca microlepis*	334
Lutjanus griseus	326	*Leiostomus xanthurus*	321
Mugil curema	126	*Lutjanus synagris*	300
Paralichthys albigutta	110	*Mugil gyrans*	203
Lutjanus synagris	100	*Trachinotus falcatus*	166
Scomberomorus maculatus	92	*Mugil curema*	59
Trachinotus falcatus	81	*Scomberomorus maculatus*	50
Mycteroperca microlepis	53	*Paralichthys albigutta*	35
Trachinotus carolinus	25	*Pomatomus saltatrix*	17
Menippe spp.	24	*Menippe* spp.	15
Pogonias cromis	22	*Trachinotus carolinus*	12
Pomatomus saltatrix	20	*Menticirrhus saxatilis*	6
Menticirrhus saxatilis	19	*Epinephelus itajara*	5
Rachycentron canadum	7	*Epinephelus morio*	3
Menticirrhus littoralis	5	*Rachycentron canadum*	3
		Pogonias cromis	1
Total	**18,094**	**Total**	**15,007**

Table OV02-04. (Continued)

N. Indian River Lagoon		Cedar Key	
Scientific Name	**Number**	**Scientific Name**	**Number**
Leiostomus xanthurus	16,110	*Leiostomus xanthurus*	9,165
Micropogonias undulatus	5,805	*Mugil cephalus*	2,091
Mugil curema	2,591	*Cynoscion arenarius*	1,686
Mugil cephalus	2,469	*Callinectes sapidus*	1,131
Farfantepenaeus duorarum	2,125	*Farfantepenaeus duorarum*	776
Archosargus probatocephalus	956	*Menticirrhus americanus*	564
Cynoscion nebulosus	878	*Cynoscion nebulosus*	302
Sciaenops ocellatus	768	*Paralichthys albigutta*	287
Centropomus undecimalis	568	*Sciaenops ocellatus*	273
Farfantepenaeus spp.	352	*Micropogonias undulatus*	269
Callinectes sapidus	286	*Pogonias cromis*	190
Elops saurus	251	*Elops saurus*	180
Lutjanus griseus	214	*Menippe* spp.	173
Menticirrhus americanus	209	*Mugil curema*	155
Farfantepenaeus aztecus	146	*Archosargus probatocephalus*	138
Pogonias cromis	142	*Lutjanus griseus*	135
Trachinotus falcatus	69	*Mugil gyrans*	123
Lutjanus synagris	47	*Scomberomorus maculatus*	48
Litopenaeus setiferus	39	*Lutjanus synagris*	41
Penaeidae spp.	28	*Trachinotus falcatus*	32
Paralichthys albigutta	26	*Paralichthys lethostigma*	23
Cynoscion regalis	21	*Trachinotus carolinus*	6
Albula vulpes	13	*Mycteroperca microlepis*	5
Scomberomorus maculatus	10	*Menticirrhus saxatilis*	2
Trachinotus carolinus	8	*Pomatomus saltatrix*	2
Lepisosteus platyrhincus	6	*Rachycentron canadum*	1
Lutjanus analis	6		
Mycteroperca microlepis	6		
Cynoscion spp.	4		
Pomatomus saltatrix	4		
Paralichthys lethostigma	3		
Lutjanus apodus	2		
Menippe spp.	2		
Scomberomorus regalis	1		
Total	**34,165**		**17,798**

Table OV02-04. (Continued)

S. Indian River Lagoon		Apalachicola Bay	
Scientific Name	**Number**	**Scientific Name**	**Number**
Mugil curema	1,163	*Leiostomus xanthurus*	26,389
Archosargus probatocephalus	816	*Micropogonias undulatus*	5,619
Mugil cephalus	606	*Mugil cephalus*	5,493
Centropomus undecimalis	566	*Cynoscion arenarius*	3,134
Elops saurus	273	*Farfantepenaeus* spp.	1,572
Micropogonias undulatus	263	*Callinectes sapidus*	785
Lutjanus synagris	165	*Sciaenops ocellatus*	765
Lutjanus griseus	146	*Litopenaeus setiferus*	737
Lutjanus analis	131	*Menticirrhus americanus*	613
Sciaenops ocellatus	55	*Mugil curema*	595
Mycteroperca microlepis	50	*Lucania parva*	522
Pogonias cromis	46	*Farfantepenaeus duorarum*	498
Callinectes sapidus	31	*Farfantepenaeus aztecus*	438
Paralichthys albigutta	17	*Cynoscion nebulosus*	318
Scomberomorus maculatus	15	*Paralichthys albigutta*	295
Trachinotus falcatus	14	*Lutjanus synagris*	168
Leiostomus xanthurus	14	*Archosargus probatocephalus*	160
Cynoscion nebulosus	11	*Trachinotus falcatus*	144
Paralichthys lethostigma	10	*Paralichthys lethostigma*	106
Panulirus argus	8	*Elops saurus*	91
Farfantepenaeus duorarum	5	*Mycteroperca microlepis*	85
Albula vulpes	4	*Pomatomus saltatrix*	72
Pomatomus saltatrix	4	*Lutjanus griseus*	70
Trachinotus carolinus	3	*Trachinotus carolinus*	55
Epinephelus itajara	2	*Menticirrhus littoralis*	53
Menippe spp.	1	*Menippe* spp.	44
Epinephelus morio	1	*Menticirrhus saxatilis*	26
Mycteroperca bonaci	1	*Scomberomorus maculatus*	19
Lutjanus apodus	1	*Paralichthys squamilentus*	11
Cynoscion spp.	1	*Pogonias cromis*	11
Menticirrhus americanus	1	*Cynoscion nothus*	5
		Megalops atlanticus	1
		Rachycentron canadum	1
Total	**4,424**	**Total**	**48,895**

Table OV02-04. (Continued)

Florida Keys			
Visual Surveys		6.1-m Otter Trawl Samples	
Scientific Name	**Number**	**Scientific Name**	**Number**
Haemulon plumieri	8,343	*Haemulon plumieri*	877
Haemulon flavolineatum	5,803	*Lutjanus synagris*	169
Haemulon aurolineatum	5,783	*Lutjanus griseus*	75
Haemulon sciurus	5,275	*Haemulon sciurus*	30
Ocyurus chrysurus	3,440	*Lachnolaimus maximus*	30
Haemulon spp.	2,316	*Panulirus argus*	24
Lutjanus griseus	1,598	*Farfantepenaeus duorarum*	18
Haemulon chrysargyreum	830	*Haemulon flavolineatum*	18
Lachnolaimus maximus	798	*Ocyurus chrysurus*	17
Lutjanus apodus	710	*Haemulon aurolineatum*	9
Haemulon melanurum	685	*Anisotremus virginicus*	6
Anisotremus virginicus	652	*Menippe* spp.	5
Chaetodon capistratus	568	*Epinephelus morio*	5
Pomacanthus arcuatus	529	*Paralichthys albigutta*	4
Chaetodon ocellatus	395	*Pomacanthus paru*	2
Haemulon carbonarium	390	*Mycteroperca microlepis*	1
Chaetodon sedentarius	326	*Lutjanus analis*	1
Holacanthus tricolor	274	*Chaetodon ocellatus*	1
Epinephelus cruentatus	237	*Chaetodon capistratus*	1
Bodianus rufus	214	*Pomacanthus arcuatus*	1
Holacanthus ciliaris	200		
Epinephelus morio	171		
Mycteroperca bonaci	149		
Lutjanus analis	148		
Lutjanus synagris	130		
Holacanthus bermudensis	120		
Chaetodon striatus	117		
Pomacanthus paru	104		
Haemulon macrostomum	104		
Haemulon striatum	100	**Total**	**1,294**

Table OV02-04. (Continued)

Florida Keys (Continued)	
Visual Surveys (Continued)	
Scientific Name	**Number**
Balistes capriscus	71
Haemulon parrai	59
Anisotremus surinamensis	30
Lutjanus mahogoni	29
Epinephelus adscensionis	19
Haemulon album	17
Epinephelus guttatus	15
Mycteroperca microlepis	14
Lutjanus jocu	13
Epinephelus striatus	11
Epinephelus fulvus	11
Balistes vetula	11
Mycteroperca phenax	10
Bodianus pulchellus	7
Mycteroperca venenosa	6
Priacanthus arenatus	4
Lutjanus buccanella	4
Canthidermis sufflamen	4
Melichthys niger	4
Epinephelus itajara	3
Mycteroperca interstitialis	3
Priacanthus cruentatus	2
Total	**40,856**

Table OV02-04. (Continued)

Northeast Florida	
Scientific Name	**Number**
Litopenaeus setiferus	9,436
Mugil cephalus	6,391
Micropogonias undulatus	4,896
Leiostomus xanthurus	2,921
Callinectes sapidus	1,168
Mugil curema	1,079
Farfantepenaeus duorarum	893
Cynoscion regalis	681
Menticirrhus americanus	520
Cynoscion nebulosus	376
Trachinotus carolinus	371
Archosargus probatocephalus	256
Elops saurus	224
Sciaenops ocellatus	217
Paralichthys lethostigma	206
Farfantepenaeus aztecus	186
Scomberomorus maculatus	128
Farfantepenaeus spp.	117
Pogonias cromis	88
Paralichthys albigutta	88
Menticirrhus littoralis	78
Lutjanus griseus	64
Pomatomus saltatrix	61
Trachinotus falcatus	58
Lutjanus synagris	21
Menippe spp.	14
Menticirrhus saxatilis	12
Centropomus undecimalis	3
Rachycentron canadum	2
Paralichthys dentatus	2
Penaeidae spp.	1
Paralichthys spp.	1
Mycteroperca microlepis	1
Lutjanus analis	1
Farfantepenaeus brasiliensis	1
Total	**30,562**

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Fisheries-Independent Monitoring

Introduction

The Florida Fish and Wildlife Conservation Commission (FWC), Florida Marine Research Institute's (FMRI), 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 fish and selected invertebrates; 2) provide timely information for use in management plans; and 3) monitor trends in the relative abundance of fishes 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, or 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, and necessary modifications to harvest regulations can 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 Florida Marine Research Institute (FMRI) 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 state appropriations. The FIM program is now partially supported by funds from the sale of Florida saltwater fishing licenses as well as the SFR grant. In addition, the Florida Keys National Marine Sanctuary (FKNMS) Final Management Plan, adopted by both the federal and State of Florida governments in 1996 and placed into effect on July 1, 1997, identifies the state's FIM program as having the primary responsibility for fisheries pre-recruitment monitoring in the FKNMS. Sampling began in Tampa Bay and Charlotte Harbor during 1989, in the northern Indian River Lagoon during 1990, in Cedar Key during 1996, in the southern Indian River Lagoon during 1997, in Apalachicola Bay in 1998, in the FKNMS in 1998, and in northeast Florida (Jacksonville Field Laboratory) in 2001 (Figure FIM02-01). Fisheries-Independent Monitoring program sampling was also conducted in Choctawhatchee Bay/Santa Rosa Sound between 1992 and 1997, and in Florida Bay between 1993 and 1997.

Florida's coastline extends from subtropical to temperate regions and includes habitats such as seagrass beds, salt marshes, and mangroves that provide critical nursery areas for many fish and invertebrate species. It is estimated that over 70% of the recreationally important species and over 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 Florida Reef Tract, located immediately offshore of the southeastern tip of the Florida Peninsula and the Florida Keys, supports a high proportion of the state's important recreational and commercial reef fish fisheries, which are primarily composed of snapper, grouper, and grunt species (Chiappone and Sluka 1996). 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 fishes 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, gillnets) 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 in developing recruitment indices. The program expanded its efforts to monitor larger-sized fishes in Tampa Bay by developing 183-m haul seines (implemented in 1993), 183-m purse seines (implemented in 1997), and by developing a visual sampling program for reef fishes in the Florida Keys (implemented in 1998). The implementation of the visual surveys in the FKNMS allowed fisheries independent information to be obtained in this unique area of Florida first time and was an important expansion to the FIM program. The 183-m haul seine gear was implemented as part of the stratified-random sampling (SRS) component of the program in Charlotte Harbor during 1996, in the northern and southern Indian River Lagoon and Cedar Key during 1997, in Apalachicola Bay during 1998, and in northeast Florida during 2001. Implementation of purse seine SRS in Charlotte Harbor began in 1998 and for a trial in Apalachicola Bay during 2000, but ended in 2001. The FIM program also assumed responsibility for an ongoing, seasonal, directed sampling program in Tampa Bay and Charlotte Harbor for striped mullet (*Mugil cephalus*) in 1993. The inclusion of gears and directed sampling efforts that capture larger-sized fishes enables the FIM program to provide data on many species from initial recruitment into the estuarine system through harvestable size, thereby providing a continuous gauge of a particular stock's relative abundance, age and size composition, and reproductive potential.

This report summarizes monitoring data collected by the FIM program during 2002. Results from SRS in each system are presented separately. This report also summarizes directed sampling efforts for striped mullet and presents results from fish health monitoring. Profiles of several species that are of particular interest because of their recreational and commercial value in Florida are also presented. The profiles provide critical information for certain 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 multi-gear approach to collect data on fishes and selected invertebrates from a wide range of habitats and life history stages (Table FIM02-01). A 21.3-m center bag seine was used to collect juvenile and sub-adult fishes in shallow areas (< 1.8 m); a 6.1-m otter trawl was used to collect juvenile, sub-adult, and adult fish in deep water (1.0-7.6 m); a 183-m haul seine was used to collect sub-adult and adult fish in shallow water (< 2.5 m) along shorelines; a 183-m purse seine was used to collect sub-adult and adult fishes in intermediate depths (1.0-3.3 m); and visual surveys were conducted to observe reef fishes in the Florida Keys at depths to 30 m.

Several different techniques were used, depending on habitat, to stratify the samples collected with the various gears. Samples collected with 21.3-m seines in Tampa Bay, Charlotte Harbor, the northern Indian River Lagoon, Cedar Key, and Apalachicola Bay were made with the bay seine technique (formerly referred to as “offshore” or “standard” seine technique) and pre-stratified by the presence or absence of bottom vegetation (except in the Cedar Key area), or the presence of a shoreline. Samples collected with 21.3-m river seines (formerly referred to as the “boat” seine technique) in Tampa Bay and Charlotte Harbor were pre-stratified by the presence or absence of overhanging shoreline vegetation and deployed directly from the boat along shorelines of rivers or tidal creeks. Samples collected with river seines in the northern Indian River Lagoon, 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 deployed along the shoreline and pre-stratified by the presence or absence of overhanging shoreline vegetation. Samples collected with this gear were not pre-stratified by habitat type in Apalachicola Bay, Cedar Key, and northeast Florida. However, samples collected by 183-m haul seines in the northern and southern Indian River Lagoon were post-stratified by the presence or absence of overhanging shoreline vegetation. Samples collected by 183-m purse seines were post-stratified by the presence or absence of bottom vegetation in Tampa Bay and Charlotte Harbor. Details of other gears and sampling techniques, including visual survey techniques used to monitor reef tract species and trawls conducted throughout the state, are described in the FIM program's Procedure Manual.

A SRS design was used in all study areas. Each study area was divided into sampling zones based on geographic and logistical criteria, and each zone was further subdivided into 1-nm^2 grids that were randomly selected for sampling. 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. A single sample was collected at each randomly selected site, except during the visual sampling in the Florida Keys, where multiple (four 5-m radius point counts) censuses were conducted. Sampling grids were stratified by habitat and depth, thereby identifying the gear types that could be used in those areas. All sampling was conducted during daytime hours (one hour after sunrise to one hour before sunset).

Environmental data consisting of water quality, habitat characteristics, and physical parameters such as current and tidal conditions were recorded for each sample. The sample work-up technique was similar for all collected samples, regardless of gear type or sampling regime. All fish and invertebrate species (i.e., blue crabs, stone crab, Penaeid shrimp, horseshoe crabs, cannonball jellyfish, and Callinectes crabs) captured in net collections were identified to the lowest practical taxonomic level, counted, and measured (standard length for teleosts, precaudal length for sharks, disc width for rays, carapace width for crabs, and post-orbital head length for shrimp). Animals were then released except for representative samples of each taxon (for laboratory confirmation of field identifications) and samples required for specific research projects. During visual census sampling of reef fishes, estimated lengths (natural total length) of selected reef fish species were recorded using 5-cm length intervals for fishes below 60 cm, and into 10-cm intervals for fishes above 60 cm, based on direct observations by trained divers using SCUBA. A detailed explanation of the standard sample work-up and visual survey methodology for data collection is described in the FIM program's Procedure Manual. The taxonomic nomenclature in this report follows the American Fisheries Society's Common and Scientific Names of Fishes (Robins et al. 1991).

Abundance estimates were calculated for 21.3-m seines, visual surveys, and trawls as the number of fish per 100 m^2 of area sampled. Catch-per-unit-effort was calculated for 183-m haul and purse seine samples as the number of fish per haul. Data were summarized separately for each bay 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 FIM02-02). For trawl sampling conducted in the FKNMS, Selected Taxa included both the species of statewide special importance (Table FIM02-02) and the species targeted during the visual surveys (Table KY02-01). Certain taxa were not identified to species because of the possibility of hybridization (*Brevoortia* spp., *Menidia* spp.; Dahlberg 1970, Middaugh et al. 1986) or because they were morphologically or meristically indistinguishable at small juvenile sizes (*Eucinostomus* spp. <40 mm SL; Matheson 1983). These aggregated species were treated as a single species. The appendices for each study area describe the catch by month (Appendix 1), as well as by gear, stratum, and zone (Appendix 2).

Study Areas

The FIM program has established monitoring programs in Tampa Bay, Charlotte Harbor, the northern Indian River Lagoon, Cedar Key, the southern Indian River Lagoon, Apalachicola Bay, the Florida Keys, and northeast Florida (Figure FIM02-01). In all regions, 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, Little Manatee, and Manatee Rivers), Charlotte Harbor (Peace and Myakka Rivers), the Indian River Lagoon (Sebastian River and St. Lucie River), Apalachicola Bay (Apalachicola River and Carrabelle River), the Cedar Key area (Suwannee River), northeast Florida (St. Marys, Nassau, and St. Johns Rivers), and the shallow coastal marine waters and reef tract areas surrounding the Florida Keys were sampled. In contrast to the estuarine waters historically sampled by the FIM program, sampling in the Florida Keys region was conducted in the waters of the Florida Keys National Marine Sanctuary, which is comprised of coral reef, hard bottom, and seagrass habitats with consistent near-oceanic salinities. This has required the development and implementation of sampling strategies unique to the Keys area within the overall FIM program, including sampling of the Florida reef tract using visual survey methods. Details of the study areas for Tampa Bay, Charlotte Harbor, and the northern Indian River Lagoon were described in the FIM Program 1994 Annual Data Summary Report. The Cedar Key study area was described in the FIM Program 1996 Annual Data Summary Report, while details of the southern Indian River Lagoon study area are described in the FIM Program 1997 Annual Data Summary Report. The Apalachicola Bay study area, as well as changes to the southern Indian River Lagoon study area and a brief description of the Florida Keys study area, were described in the FIM Program 1998 Annual Data Summary Report. A more comprehensive description of the Florida Keys Study area was presented in the FIM Program 1999 Annual Data Summary Report. A detailed description of the northeast Florida (Jacksonville) study area was described in the FIM Program 2001 Annual Data Summary Report.

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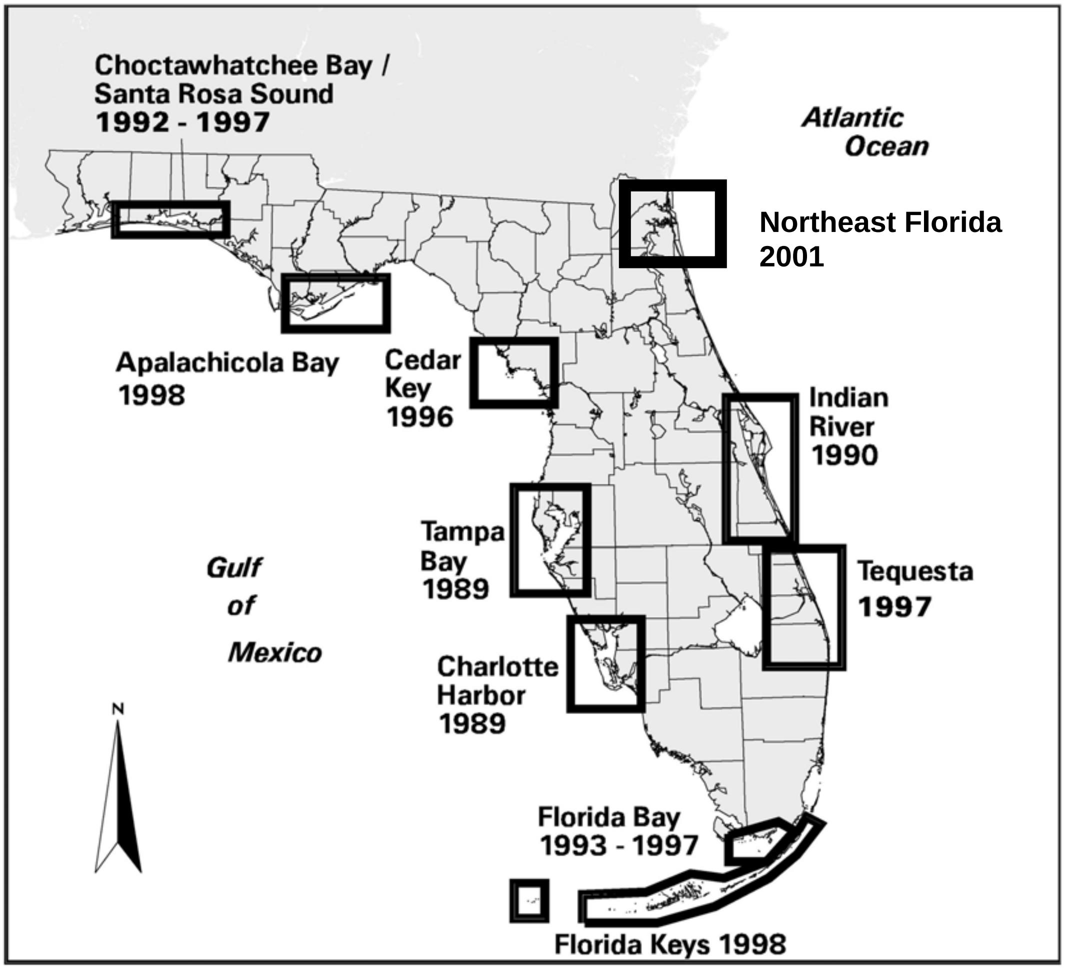

FIM02-01. Locations of Fisheries-Independent Monitoring program field labs. Years indicate initiation of sampling.

Table FIM02-01. Description of monthly monitoring sampling gears used in 2002. 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 shallow (≤1.5-m) near-shore and shoreline areas
	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)
183-m Purse Seine	Boat	50	2,668-m^2	• used in intermediate depths (<3.3-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 1.8-m deep
Visual Surveys	Point Counts	.	5-m radius cylinder (79- m^2)	• stationary diver censuses an area 10-m in diameter from the bottom to the surface

Table FIM02-02. Animals designated as Selected Taxa because of their commercial or recreational importance. In the Florida Keys, an additional listing of reef fish taxa is also used (see Table KY02-01).

Scientific Name	Common Name
Albula vulpes	Bonefish
Archosargus probatocephalus	Sheepshead
Callinectes sapidus	Blue Crab
Centropomus undecimalis	Snook
Cynoscion arenarius	Sand Seatrout
Cynoscion nebulosus	Spotted Seatrout
Cynoscion nothus	Silver Seatrout
Cynoscion regalis	Weakfish
Cynoscion spp.	
Elops saurus	Ladyfish
Epinephelus acanthistius	
Epinephelus adscensionis	Rock Hind
Epinephelus afer	Mutton Hamlet
Epinephelus cruentatus	Graysby
Epinephelus drummondhayi	Speckled Hind
Epinephelus flavolimbatus	Yellowedge Grouper
Epinephelus fulvus	Coney
Epinephelus guttatus	Red Hind
Epinephelus inermis	Marbled Grouper
Epinephelus itajara	Goliath Grouper
Epinephelus morio	Red Grouper
Epinephelus mystacinus	Misty Grouper
Epinephelus nigritus	Warsaw Grouper
Epinephelus niveatus	Snowy Grouper
Epinephelus striatus	Nassau Grouper
Farfantepenaeus aztecus	Brown Shrimp
Farfantepenaeus duorarum	Pink Shrimp
Farfantepenaeus brasiliensis	
Leiostomus xanthurus	Spot
Litopenaeus setiferus	White Shrimp
Lutjanus analis	Mutton snapper
Lutjanus apodus	Schoolmaster
Lutjanus argentimaculatus	
Lutjanus buccanella	Blackfin snapper

Table FIM02-02. (Continued)

Scientific Name	Common Name
Lutjanus campechanus	Red Snapper
Lutjanus cyanopterus	Cubera snapper
Lutjanus griseus	Gray Snapper
Lutjanus jocu	Dog snapper
Lutjanus mahogoni	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 saxatillis	Northern Kingfish
Micropogonias undulatus	Atlantic croaker
Mugil cephalus	Striped Mullet
Mugil curema	White Mullet
Mugil gaimardianus	Redeye mullet
Mugil gyrans	Fantail Mullet
Mugil liza	Liza
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.	
Pogonias cromis	Black Drum
Pomatomus saltatrix	Bluefish
Rachycentron canadum	Cobia
Sciaenops ocellatus	Red Drum
Scomberomorus cavalla	King Mackerel
Scomberomorus maculatus	Spanish Mackerel

Table FIM02-02. (Continued)

Scientific Name	**Common Name**
Scomberomorus regalis	Cero
Trachinotus carolinus	Pompano
Trachinotus falcatus	Permit
Trachinotus goodie	Palometa

Tampa Bay

Tampa Bay is a large industrialized estuary, bordered by rapidly growing urban areas of Tampa, Clearwater, and St. Petersburg. The counties surrounding the bay (Hillsborough, Pinellas, and Manatee) have experienced some of the greatest population growth in the entire Gulf of Mexico area (Rote 1991). The population density in the Tampa Bay watershed is the highest among major U.S. Gulf coast estuaries (Lowery 1993). The regional population has impacted the natural resources, including fisheries, through a combination of habitat degradation, increased fishing pressure, and increased recreational use of aquatic resources (Estevez et al. 1985).

Since 1989, the Fisheries-Independent Monitoring (FIM) program has monitored the fish populations and selected invertebrates in Tampa Bay through an intensive sampling program. This section summarizes data collected by the FIM program during 2002. The sampling area was divided into five bay zones (A-E) and a riverine zone (F) that encompassed the lower portions of the Alafia (K), Little Manatee (L), Manatee (M), and Braden (N) Rivers (Figure TB02-01). Stratified-random sampling (SRS) was conducted each month with 21.3-m seines, 183-m haul seines, 183-m purse seines, and 6.1-m otter trawls. Sampling with 21.3-m seines and haul seines was stratified by zone, depth, and habitat whereas sampling with purse seines and otter trawls was stratified only by zone and depth. A fixed number of samples were collected each month with all gear types in all zones with the following exceptions: trawling in Zones A-E was limited to October and November, haul seines were not used in Zone F or the northern portion of Zone D, and purse seine effort in Zone A was limited to April and October and did not exist in Zone F. All gear deployment methods were the same as those described in the Methods section of this report.

Stratified-Random Sampling

A total of 562,055 fishes and selected invertebrates were collected from 1,240 samples representing 129 taxa (Table TB02-01). The greatest number of fishes were collected during April, September, October, and November (Appendix TB02-01). *Anchoa mitchilli* and *Menidia* spp. dominated the annual catch overall (66.4% of the total catch). Both species were taken in all months and from all regions of the bay, but the majority was found in or adjacent to the rivers. Larger collections of *A. mitchilli* were observed during April, September, October, and November, while larger catches of *Menidia* spp. were taken during April, May, June, and July (Appendices TB02-01 and –02).

Twenty-five species categorized as Selected Taxa were captured in Tampa Bay SRS during 2002, representing 4.1% (n=23,223) of the annual catch. *Leiostomus xanthurus* was the most abundant selected finfish (n=4,120) and was collected primarily during February and March, from Zones D, E, and F (Appendices TB02-01 and –02). The second most abundant selected finfish was *Elops saurus* (n=3,770). The majority of *E. saurus* were collected in the 183-m purse seine, primarily during February, March, April and September from Zone B. Members of the family Sciaenidae (i.e., *Cynoscion arenarius, Cynoscion nebulosus, L. xanthurus, Menticirrhus americanus, Menticirrhus littoralis, Menticirrhus saxatilis, Pogonias cromis*, and *Sciaenops ocellatus*) composed a significant portion of the Selected Taxa captured (n=8,589). The most abundant Selected Invertebrate was *Farfantepenaeus duorarum* (n=5,129), and together with the sciaenid species, they composed the majority of captured Selected Taxa (59.1; n=13,718).

Bay Sampling

21.3-m Bay Seines. A total of 128,924 animals were collected in 21.3-m bay seines (n=300 hauls; Table TB02-01), representing 22.9% of the total annual catch. *Anchoa mitchilli* (n=50,113), *Lagodon rhomboides* (n=10,848) and *Eucinostomus* spp. (10,269) accounted for the majority (55.2%) of the animals collected in the 21.3-m bay seine (Table TB02-02). The two most consistently collected taxa in the 21.3-m bay seines were *Eucinostomus* spp. (48.0% occurrence) and *L. rhomboides* (41.7% occurrence). These species were generally collected over vegetated substrate or along shoreline habitats (Appendix TB02-02).

A total of 4,105 animals (20 taxa) designated as Selected Taxa were collected in 21.3-m bay seines, accounting for 3.2% of the total bay seine catch (Table TB02-03). Among finfish, *L. xanthurus* (n=635) and *C. nebulosus* (n=343) were the most abundant Selected Taxa collected with the 21.3-m bay seine. *Farfantepenaeus duorarum* (n=2,404) was the most abundant Selected Invertebrate (Appendix TB02-02)

183-m Haul Seines. A total of 38,792 individuals were collected in 240 hauls, representing 75 fish taxa and 4 invertebrate taxa (Table TB02-01; Appendix TB02-02). *Lagodon rhomboides* (n=15,330) and *Harengula jaguana* (n=7,119) accounted for the majority (57.9%) of animals collected in the 183-m haul seine (Table TB02-04). Three species were exclusively collected in this gear: *Caranx latus* (n=1), *Diapterus auratus* (n=1), and *Sphyraena barracuda* (n=21).

Twenty-four Selected Taxa were captured in the haul seine and represented 12.5% (n=4,853) of the haul seine catch (Table TB02-05). *Centropomus undecimalis* (n=1,575) was the most abundant species caught with this gear, followed by *Mugil cephalus* (n=649). *Mugil cephalus* was the most frequently captured Selected Taxon occurring in 49.6% of all samples. The next most frequently captured Selected Taxon was *Centropomus undecimalis* (42.1% occurrence) followed by *Archosargus probatocephalus* (32.5% occurrence n=288;).

183-m Purse Seines. A total of 26,161 animals were collected in 250 purse seine hauls, representing 73 fish taxa and 4 invertebrate taxa (Tables TB02-01 and -06, Appendix TB02-02). *Lagodon rhomboides* (n=4,895), *Opisthonema oglinum* (n=4,857), and *E. saurus* (n=3,255) accounted for 49.7% of the total purse seine catch (Table TB02-06). Two of the top ten numerically dominant species collected in purse seines, *E. saurus* and *L. xanthurus,* were Selected Taxa. Eight species were exclusively collected in 183-m purse seines: *Aetobatis narinari* (n=1), *Ancylopsetta quadrocellata* (n=3), Balistidae (n=1), *Caranx crysos* (n=6), *Ginglymostoma cirratum* (n=1), *Ocyurus chrysurus* (n=1), *Peprilus alepidotus* (n=42), and *Pomatomus saltatrix* (n=20).

Twenty-three Selected Taxa were captured in the purse seine and represented 23.0% (n=6,022) of the total purse seine catch (Table TB02-07). *Elops saurus* (n=3,255; 28.0% occurrence) and *C. nebulosus* (19.2% occurrence; n=274) were the most abundant Selected Taxa captured. Other Selected Taxa were captured less frequently and in less abundance.

Seasonal Bay 6.1-m Otter Trawls. A total of 1,455 animals were collected in 30 trawl deployments (Tables TB02-01 and -08). *Eucinostomus gula* (n=339), *A. mitchilli* (n=269), and *P. scitulus* (n=192) were the three most abundant species in the seasonal trawl samples. *Prionotus scitulus* was more frequently collected (76.7% occurrence) in bay trawls than in any other sampling gear. Fewer, but larger *L. rhomboides* (n=72; mean SL=105 mm) were collected in bay trawls than in 21.3-m bay seines (n=10,848; mean SL=33 mm) (Table TB02-02).

Eight Selected Taxa were captured during otter trawl sampling, accounting for 13.9% (n=202) of the total otter trawl catch (Table TB02-09). Among these taxa, *C*. *arenarius* (n=40) and *M. americanus* (n=35) were the most abundant finfish, and *F. duorarum* (n=93) was the most abundant invertebrate. These three species represented 83.2% of all Selected Taxa collected in seasonal trawls.

River Sampling

21.3-m River Seines. River seine deployments (n=264) accounted for 60.7% (n=341,072) of the total animals collected during 2002 (Tables TB02-01 and -10). As in 21.3-m bay seine collections, *A. mitchilli* (n=274,036) made up the majority (80.3%) of the animals collected with this gear and comprised 48.8% of the total number of animals collected in 2002.

Fifteen Selected Taxa were captured during 21.3-m river seine sampling, representing 1.3% (n=4,593) of the total 21.3-m river seine catch (Table TB02-11). Among these taxa, *L. xanthurus* (n=1,522; 15.2% occurrence) and *S. ocellatus* (n=721; 25.4% occurrence) were the most numerous finfishes, and *F.*

duorarum (n=1,051; 37.5% occurrence) and *C. sapidus* (n=82; 12.1% occurrence) were the most numerous invertebrates collected.

River 6.1-m Otter Trawls. A total of 25,651 animals were collected in 156 trawl samples. These animals represented 7.0% of the total river catch and 4.6% of the total captured in 2002 (Tables TB02-01 and -12). The three most abundant taxa in the 6.1-m river otter trawl catch were *A. mitchilli* (n=15,290; 43.6% occurrence), *Eucinostomus* spp. (n=2,274; 29.5% occurrence) and *Trinectes maculatus* (n=1,886; 34.6% occurrence). *Farfantepenaeus duorarum* (n=1,486; 50.0% occurrence) was the most abundant invertebrate collected in the river 6.1-m otter trawls.

A total of 3,448 animals categorized as Selected Taxa (12 taxa) were collected in river 6.1-m otter trawls, accounting for 13.4% of the annual river 6.1-m otter trawl catch (Table TB02-13). The four most abundant Selected Taxa collected by this gear were *F. duorarum* (n=1,486), *C. arenarius* (n=834), *M. americanus* (n=773), and *C. sapidus* (n=189).

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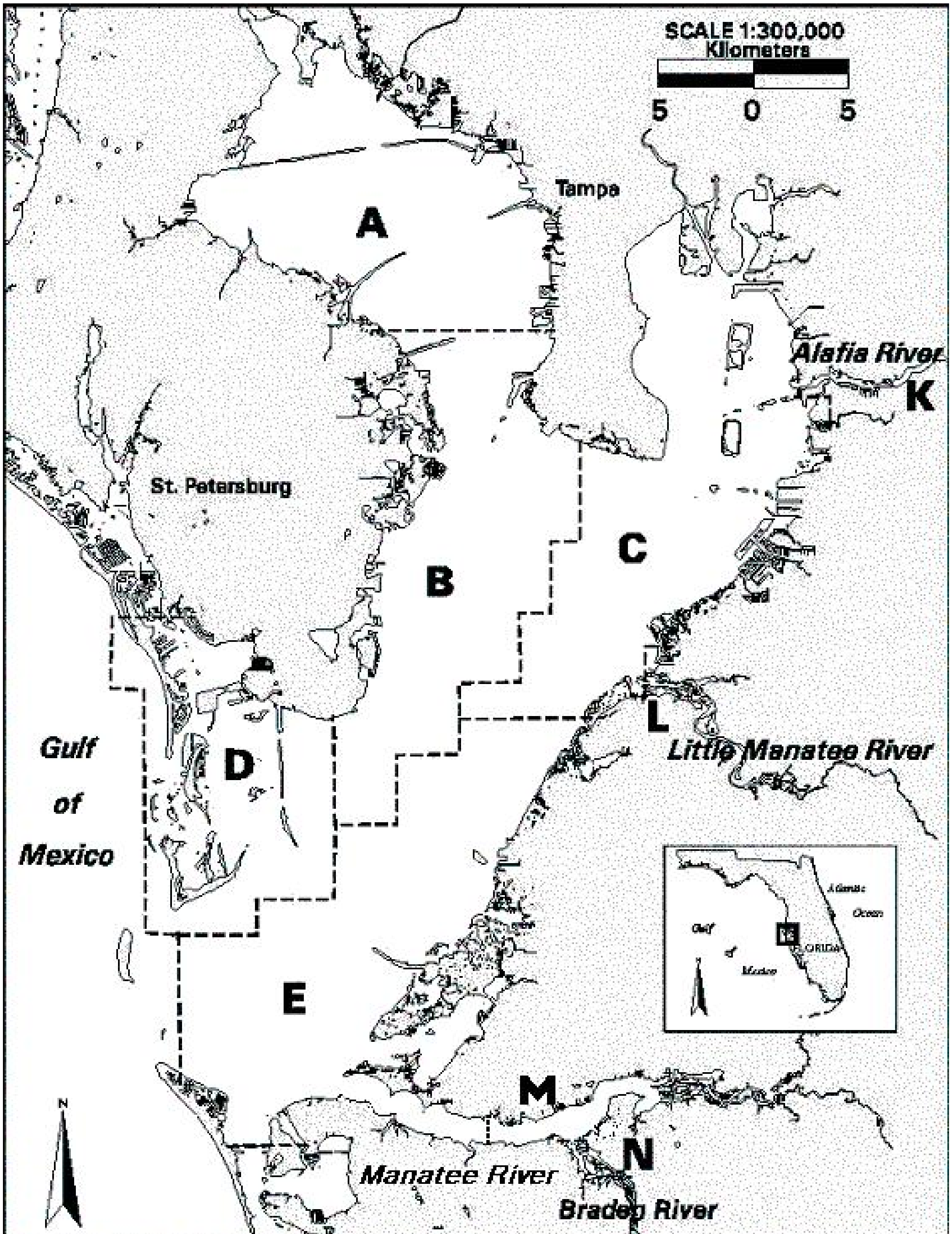

Figure TB02-01. Map of Tampa Bay sampling area. Zones are labeled A-E and K-M.

Table TB02-01. Summary of catch and effort data for Tampa Bay stratified-random sampling, 2002.

Zone	21.3-m bay seine		21.3-m river seine		183-m haul seine		183-m purse seine		6.1-m otter trawl		Totals	
	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls
A	32,302	60	.	.	3,542	48	424	10	547	6	36,815	124
B	9,849	59	.	.	8,884	48	6,494	71	124	6	25,351	184
C	9,250	71	.	.	2,436	48	2,447	48	449	8	14,582	175
D	56,905	49	.	.	12,369	36	8,281	60	94	4	77,649	149
E	20,618	61	.	.	11,561	60	8,515	61	241	6	40,935	188
K	.	.	117,863	48	.	.	.	.	3,586	24	121,449	72
L	.	.	122,277	96	.	.	.	.	14,726	72	137,003	168
M	.	.	48,562	72	.	.	.	.	4,687	36	53,249	108
N	.	.	52,370	48	.	.	.	.	2,652	24	55,022	72
Totals	**128,924**	**300**	**341,072**	**264**	**38,792**	**240**	**26,161**	**250**	**27,106**	**186**	**562,055**	**1,240**

Table TB02-02. Catch statistics for 10 dominant taxa collected in 300 21.3-m bay seine samples during Tampa Bay stratified-random sampling, 2002. 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	50,113	38.9	19.7	119.32	75.40	1,094.48	20,670.00	33	0.02	17	60
Lagodon rhomboides	10,848	8.4	41.7	25.83	6.23	417.57	1,283.57	33	0.14	12	178
Eucinostomus spp.	10,269	8.0	48.0	24.45	4.00	283.46	600.00	27	0.07	5	46
Harengula jaguana	9,993	7.8	9.3	23.79	12.16	885.27	3,268.57	44	0.15	25	125
Lucania parva	8,563	6.6	22.0	20.39	7.63	647.80	2,107.86	23	0.05	9	44
Anchoa hepsetus	7,830	6.1	6.0	18.64	18.02	1,673.94	5,405.00	42	0.04	19	91
Menidia spp.	6,619	5.1	25.0	15.76	3.94	433.22	592.14	42	0.15	15	94
Anchoa cubana	2,464	1.9	1.7	5.87	5.79	1,710.24	1,737.86	38	0.07	26	47
Bairdiella chrysoura	2,453	1.9	20.7	5.84	2.90	859.94	848.57	35	0.37	9	148
Farfantepenaeus duorarum	2,404	1.9	32.7	5.72	1.58	477.28	288.57	11	0.08	3	27
Subtotal	111,556	86.6	.	.	.	.	.	.	.	3	178
Totals	**128,924**	**100.0**	**.**	**306.96**	**107.54**	**606.83**	**28,679.29**	**.**	**.**	**3**	**505**

Table TB02-03. Catch statistics for Selected Taxa collected in 300 21.3-m bay seine samples during Tampa Bay stratified-random sampling, 2002. 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	2,404	1.9	32.7	5.72	1.58	477.28	288.57	11	0.08	3	27
Leiostomus xanthurus	635	0.5	9.7	1.51	0.85	969.59	211.43	34	0.50	15	165
Cynoscion nebulosus	343	0.3	22.3	0.82	0.17	350.32	35.71	38	1.01	14	115
Mugil cephalus	274	0.2	5.3	0.65	0.30	790.49	63.57	35	2.24	19	462
Sciaenops ocellatus	199	0.2	11.3	0.47	0.15	560.76	37.86	29	2.72	6	341
Lutjanus griseus	64	0.0	7.3	0.15	0.05	549.14	8.57	52	4.39	11	170
Menticirrhus americanus	37	0.0	4.0	0.09	0.03	650.47	6.43	23	1.60	9	52
Callinectes sapidus	37	0.0	8.3	0.09	0.02	376.40	2.14	53	7.00	10	161
Lutjanus synagris	32	0.0	3.3	0.08	0.03	647.40	5.00	34	2.45	17	74
Archosargus probatocephalus	28	0.0	5.3	0.07	0.02	485.47	2.86	64	12.82	16	338
Cynoscion arenarius	13	0.0	2.0	0.03	0.02	909.44	4.29	24	2.55	14	43
Menticirrhus saxatilis	12	0.0	3.0	0.03	0.01	605.16	1.43	35	4.65	11	56
Paralichthys albigutta	10	0.0	2.0	0.02	0.01	844.02	2.86	53	6.46	38	99
Mycteroperca microlepis	8	0.0	1.7	0.02	0.01	861.67	2.14	200	10.48	153	240
Centropomus undecimalis	3	0.0	1.0	0.01	0.00	996.65	0.71	179	121.56	17	417
Mugil curema	2	0.0	0.3	0.00	0.00	1,732.05	1.43	147	5.00	142	152

Table TB02-03. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Menippe spp.	1	0.0	0.3	0.00	0.00	1,732.05	0.71	28	.	28	28
Elops saurus	1	0.0	0.3	0.00	0.00	1,732.05	0.71	215	.	215	215
Pogonias cromis	1	0.0	0.3	0.00	0.00	1,732.05	0.71	253	.	253	253
Mugil gyrans	1	0.0	0.3	0.00	0.00	1,732.05	0.71	97	.	97	97
Totals	**4,105**	**3.2**	**63.3**	**9.77**	**1.90**	**337.26**	**307.86**	**.**	**.**	**3**	**462**

Table TB02-04. Catch statistics for 10 dominant taxa collected in 240 183-m haul seine samples during Tampa Bay stratified-random sampling, 2002. 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	15,330	39.5	51.7	63.88	12.59	305.26	1,647.00	98	0.22	50	278
Harengula jaguana	7,119	18.4	15.8	29.66	14.36	750.01	2,518.00	93	0.15	52	145
Eucinostomus gula	4,074	10.5	50.4	16.98	3.44	313.78	457.00	81	0.20	40	150
Centropomus undecimalis	1,575	4.1	42.1	6.56	1.66	391.21	273.00	448	1.89	139	882
Arius felis	1,193	3.1	37.1	4.97	1.11	347.40	171.00	308	1.09	52	390
Eucinostomus harengulus	1,115	2.9	30.0	4.65	1.05	350.51	143.00	91	0.33	45	125
Strongylura notata	834	2.1	35.4	3.48	1.07	476.30	203.00	358	1.14	92	495
Mugil cephalus	649	1.7	49.6	2.70	0.52	297.19	106.00	246	3.80	96	474
Chaetodipterus faber	560	1.4	15.4	2.33	1.51	1,005.32	360.00	146	1.34	19	298
Brevoortia spp.	547	1.4	4.6	2.28	2.06	1,397.86	493.00	117	1.16	74	220
Subtotal	32,996	85.1	.	.	.	.	.	.	.	19	882
Totals	**38,792**	**100.0**	**.**	**161.63**	**24.07**	**230.75**	**3,451.00**	**.**	**.**	**13**	**980**

Table TB02-05. Catch statistics for Selected Taxa collected in 240 183-m haul seine samples during Tampa Bay stratified-random sampling, 2002. 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	1,575	4.1	42.1	6.56	1.66	391.21	273.00	448	1.89	139	882
Mugil cephalus	649	1.7	49.6	2.70	0.52	297.19	106.00	246	3.80	96	474
Leiostomus xanthurus	466	1.2	21.7	1.94	0.64	507.70	124.00	104	1.24	51	202
Elops saurus	421	1.1	32.1	1.75	0.35	305.29	46.00	282	2.60	170	450
Mugil gyrans	300	0.8	25.4	1.25	0.31	387.97	64.00	181	2.92	62	445
Archosargus probatocephalus	288	0.7	32.5	1.20	0.20	264.21	31.00	210	5.42	50	400
Lutjanus griseus	220	0.6	14.2	0.92	0.32	542.49	61.00	162	2.94	68	325
Callinectes sapidus	186	0.5	27.1	0.78	0.14	281.79	21.00	98	2.72	24	270
Sciaenops ocellatus	180	0.5	16.7	0.75	0.28	574.75	62.00	376	10.80	90	680
Mugil curema	122	0.3	12.1	0.51	0.16	492.17	25.00	224	5.43	112	338
Cynoscion nebulosus	113	0.3	17.9	0.47	0.15	493.39	33.00	200	7.55	49	398
Farfantepenaeus duorarum	65	0.2	10.4	0.27	0.08	457.79	12.00	24	0.83	13	45
Trachinotus falcatus	65	0.2	5.4	0.27	0.11	603.93	20.00	150	8.13	45	285
Paralichthys albigutta	43	0.1	10.4	0.18	0.05	432.18	8.00	222	14.78	45	426
Scomberomorus maculatus	42	0.1	2.9	0.18	0.10	859.45	20.00	198	13.26	105	412
Mycteroperca microlepis	39	0.1	4.6	0.16	0.07	666.87	13.00	186	9.05	75	389

Table TB02-05. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Lutjanus synagris	34	0.1	3.3	0.14	0.07	757.43	12.00	96	1.46	84	116
Pogonias cromis	21	0.1	3.3	0.09	0.05	859.45	11.00	172	17.12	89	320
Cynoscion arenarius	7	0.0	2.1	0.03	0.01	728.69	2.00	189	10.00	143	211
Menticirrhus americanus	6	0.0	1.3	0.03	0.02	962.91	3.00	255	5.71	235	272
Trachinotus carolinus	4	0.0	0.8	0.02	0.01	1,223.21	3.00	303	24.96	231	340
Rachycentron canadum	3	0.0	1.3	0.01	0.01	890.68	1.00	680	162.71	421	980
Menticirrhus littoralis	3	0.0	0.8	0.01	0.01	1,152.77	2.00	206	47.70	132	295
Menippe spp.	1	0.0	0.4	0.00	0.00	1,549.19	1.00	50	.	50	50
Totals	**4,853**	**12.5**	**93.3**	**20.22**	**2.20**	**168.75**	**295.00**	**.**	**.**	**13**	**980**

Table TB02-06. Catch statistics for 10 dominant taxa collected in 250 183-m purse seine samples during Tampa Bay stratified-random sampling, 2002. 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	4,895	18.7	37.2	19.58	4.69	378.50	540.00	101	0.31	55	194
Opisthonema oglinum	4,857	18.6	30.8	19.43	7.92	644.76	1,725.00	136	0.25	84	202
Elops saurus	3,255	12.4	28.0	13.02	7.85	953.33	1,934.00	275	0.79	132	550
Arius felis	2,747	10.5	55.2	10.99	2.26	325.45	406.00	255	0.94	52	390
Leiostomus xanthurus	1,475	5.6	16.4	5.90	2.49	667.62	581.00	156	0.45	53	203
Chloroscombrus chrysurus	1,211	4.6	16.0	4.84	2.89	943.22	707.00	142	0.40	68	223
Harengula jaguana	1,144	4.4	16.0	4.58	1.94	671.91	438.00	118	0.27	80	168
Eucinostomus gula	858	3.3	26.0	3.43	0.89	409.93	167.00	90	0.42	64	188
Orthopristis chrysoptera	627	2.4	19.2	2.51	0.79	496.48	127.00	117	0.79	66	195
Bairdiella chrysoura	610	2.3	12.8	2.44	0.72	466.52	100.00	133	0.62	45	180
Subtotal	21,679	82.8	.	.	.	.	.	.	.	45	550
Totals	**26,161**	**100.0**	**.**	**104.64**	**14.05**	**212.37**	**2,004.00**	**.**	**.**	**18**	**1513**

Table TB02-07. Catch statistics for Selected Taxa collected in 250 183-m purse seine samples during Tampa Bay stratified-random sampling, 2002. 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	3,255	12.4	28.0	13.02	7.85	953.33	1,934.00	275	0.79	132	550
Leiostomus xanthurus	1,475	5.6	16.4	5.90	2.49	667.62	581.00	156	0.45	53	203
Cynoscion nebulosus	274	1.0	19.2	1.10	0.26	380.20	36.00	226	4.02	72	530
Menticirrhus americanus	274	1.0	14.4	1.10	0.48	696.74	113.00	195	1.69	129	308
Callinectes sapidus	212	0.8	15.6	0.85	0.38	707.40	90.00	108	2.05	31	200
Cynoscion arenarius	204	0.8	12.0	0.82	0.30	582.60	60.00	202	2.38	132	305
Archosargus probatocephalus	60	0.2	4.4	0.24	0.19	1,242.33	47.00	217	6.70	67	333
Scomberomorus maculatus	50	0.2	10.4	0.20	0.04	352.84	6.00	299	12.30	74	565
Paralichthys albigutta	41	0.2	11.6	0.16	0.04	390.79	8.00	209	9.72	106	381
Farfantepenaeus duorarum	30	0.1	4.0	0.12	0.06	758.71	13.00	29	1.11	18	48
Lutjanus synagris	28	0.1	3.2	0.11	0.06	793.90	11.00	104	2.94	63	139
Trachinotus carolinus	21	0.1	4.0	0.08	0.04	696.52	8.00	261	10.99	173	384
Lutjanus griseus	21	0.1	4.4	0.08	0.03	550.46	4.00	147	6.71	87	248
Pomatomus saltatrix	20	0.1	3.2	0.08	0.03	664.66	6.00	324	21.02	126	430
Trachinotus falcatus	16	0.1	1.2	0.06	0.06	1,389.72	14.00	161	7.30	118	240
Mugil cephalus	8	0.0	0.8	0.03	0.03	1,396.76	7.00	241	10.25	174	265

Table TB02-07. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Menippe spp.	7	0.0	2.4	0.03	0.01	671.56	2.00	73	6.71	45	97
Mycteroperca microlepis	6	0.0	2.0	0.02	0.01	740.10	2.00	198	21.15	150	267
Menticirrhus saxatilis	6	0.0	2.0	0.02	0.01	740.10	2.00	205	26.01	116	273
Mugil gyrans	6	0.0	0.8	0.02	0.02	1,115.79	3.00	236	7.07	218	254
Rachycentron canadum	4	0.0	1.6	0.02	0.01	785.79	1.00	436	108.77	299	760
Menticirrhus littoralis	2	0.0	0.8	0.01	0.01	1,115.79	1.00	236	6.00	230	242
Mugil curema	2	0.0	0.4	0.01	0.01	1,581.14	2.00	214	2.00	212	216
Totals	**6,022**	**23.0**	**68.8**	**24.09**	**8.35**	**548.17**	**1,941.00**	**.**	**.**	**18**	**760**

Table TB02-08. Catch statistics for 10 dominant taxa collected in 30 seasonal bay 6.1-m otter trawl samples during Tampa Bay stratified-random sampling, 2002. 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 gula	339	23.3	56.7	0.80	0.26	177.67	4.86	88	0.54	45	115
Anchoa mitchilli	269	18.5	3.3	0.60	0.60	547.72	18.15	34	0.16	29	39
Prionotus scitulus	192	13.2	76.7	0.44	0.11	140.01	2.56	91	2.28	23	150
Orthopristis chrysoptera	93	6.4	23.3	0.21	0.16	422.84	4.86	142	1.35	104	161
Farfantepenaeus duorarum	93	6.4	53.3	0.21	0.07	188.16	1.48	14	0.43	5	23
Lagodon rhomboides	72	4.9	23.3	0.17	0.07	216.13	1.15	105	1.84	73	127
Limulus polyphemus	42	2.9	13.3	0.09	0.08	481.76	2.50	37	7.61	14	210
Cynoscion arenarius	40	2.7	23.3	0.09	0.04	268.14	1.15	37	3.51	14	117
Menticirrhus americanus	35	2.4	33.3	0.08	0.03	230.75	0.88	59	10.29	17	273
Chaetodipterus faber	29	2.0	23.3	0.07	0.04	300.66	0.81	66	2.39	32	98
Subtotal	1,204	82.7	.	.	.	.	.	.	.	5	273
Totals	**1,455**	**100.0**	**.**	**3.33**	**0.81**	**133.35**	**22.73**	**.**	**.**	**5**	**360**

Table TB02-09. Catch statistics for Selected Taxa collected in 30 seasonal bay 6.1-m otter trawl samples during Tampa Bay stratified-random sampling, 2002. 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	93	6.4	53.3	0.21	0.07	188.16	1.48	14	0.43	5	23
Cynoscion arenarius	40	2.7	23.3	0.09	0.04	268.14	1.15	37	3.51	14	117
Menticirrhus americanus	35	2.4	33.3	0.08	0.03	230.75	0.88	59	10.29	17	273
Menippe spp.	15	1.0	20.0	0.03	0.02	244.95	0.34	31	3.32	6	58
Paralichthys albigutta	6	0.4	13.3	0.01	0.01	282.20	0.17	213	22.64	147	302
Lutjanus synagris	6	0.4	20.0	0.01	0.01	204.43	0.08	81	19.10	20	120
Callinectes sapidus	6	0.4	10.0	0.01	0.01	332.18	0.20	74	24.53	21	181
Lutjanus griseus	1	0.1	3.3	0.00	0.00	547.72	0.07	149	.	149	149
Totals	**202**	**13.9**	**80.0**	**0.46**	**0.13**	**157.76**	**2.36**	**.**	**.**	**5**	**302**

Table TB02-10. Catch statistics for 10 dominant taxa collected in 264 21.3-m river seine samples during Tampa Bay stratified-random sampling, 2002. 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	274,036	80.3	61.0	1,526.49	509.42	542.23	117,661.76	30	0.01	14	60
Menidia spp.	26,843	7.9	87.5	149.53	13.93	151.32	1,144.12	38	0.06	10	78
Eucinostomus spp.	7,519	2.2	58.7	41.88	5.34	207.15	569.12	29	0.07	10	42
Lucania parva	5,592	1.6	39.4	31.15	10.78	562.12	2,663.24	22	0.08	9	47
Anchoa hepsetus	3,578	1.0	10.6	19.93	11.99	977.43	2,591.18	29	0.13	19	95
Eucinostomus harengulus	3,179	0.9	63.6	17.71	2.06	188.96	195.59	61	0.25	29	116
Harengula jaguana	2,463	0.7	6.1	13.72	6.73	796.58	1,242.65	59	0.25	21	87
Fundulus majalis	2,442	0.7	11.4	13.60	4.90	585.65	825.00	38	0.27	16	88
Lagodon rhomboides	1,972	0.6	43.6	10.98	2.44	360.40	489.71	37	0.35	12	101
Bairdiella chrysoura	1,866	0.5	9.1	10.39	7.79	1,217.79	2,025.00	59	0.36	8	95
Subtotal	329,490	96.4	.	.	.	.	.	.	.	8	116
Totals	**341,072**	**100.0**	**.**	**1,899.91**	**520.48**	**445.12**	**120,930.88**	**.**	**.**	**3**	**668**

Table TB02-11. Catch statistics for Selected Taxa collected in 264 21.3-m river seine samples during Tampa Bay stratified-random sampling, 2002. 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	1,522	0.4	15.2	8.48	3.09	591.32	557.35	36	0.32	15	104
Farfantepenaeus duorarum	1,051	0.3	37.5	5.85	1.36	377.43	235.29	8	0.09	3	23
Sciaenops ocellatus	721	0.2	25.4	4.02	0.91	367.71	163.24	39	1.14	13	555
Mugil cephalus	707	0.2	11.7	3.94	1.82	751.68	394.12	36	0.93	14	382
Cynoscion nebulosus	107	0.0	13.6	0.60	0.14	388.96	25.00	40	1.97	14	121
Elops saurus	92	0.0	3.8	0.51	0.41	1,297.86	107.35	108	3.80	23	248
Cynoscion arenarius	91	0.0	5.7	0.51	0.21	682.04	47.06	27	1.32	13	80
Callinectes sapidus	82	0.0	12.1	0.46	0.13	477.50	29.41	34	3.67	7	176
Menticirrhus americanus	68	0.0	2.7	0.38	0.25	1,079.80	63.24	40	1.35	10	73
Centropomus undecimalis	67	0.0	14.4	0.37	0.07	316.79	11.76	226	19.41	14	610
Mugil gyrans	36	0.0	2.7	0.20	0.12	966.77	29.41	44	2.91	16	95
Archosargus probatocephalus	33	0.0	5.7	0.18	0.06	555.65	13.24	135	16.76	27	358
Lutjanus griseus	13	0.0	2.7	0.07	0.03	755.08	7.35	76	16.15	35	220
Paralichthys albigutta	2	0.0	0.8	0.01	0.01	1,146.73	1.47	86	41.50	44	127
Menticirrhus saxatilis	1	0.0	0.4	0.01	0.01	1,624.81	1.47	39	.	39	39
Totals	**4,593**	**1.4**	**79.5**	**25.58**	**3.88**	**246.35**	**557.35**	**.**	**.**	**3**	**610**

Table TB02-12. Catch statistics for 11 dominant taxa collected in 156 river 6.1-m otter trawl samples during Tampa Bay stratified-random sampling, 2002. 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	15,290	59.6	43.6	13.38	3.41	318.78	358.20	26	0.05	16	65
Eucinostomus spp.	2,274	8.9	29.5	2.07	0.63	380.61	61.93	29	0.14	11	42
Trinectes maculatus	1,886	7.4	34.6	1.63	0.52	393.92	68.94	34	0.27	8	91
Farfantepenaeus duorarum	1,486	5.8	50.0	1.30	0.35	335.65	37.78	10	0.14	3	47
Cynoscion arenarius	834	3.3	35.9	0.73	0.18	302.63	16.73	43	1.03	10	178
Menticirrhus americanus	773	3.0	32.7	0.69	0.31	567.34	46.82	67	1.17	13	288
Arius felis	514	2.0	37.8	0.45	0.19	521.78	20.37	144	4.42	48	388
Lagodon rhomboides	321	1.3	19.2	0.29	0.09	401.67	9.17	32	0.89	14	105
Microgobius gulosus	255	1.0	25.0	0.22	0.08	447.42	8.50	27	0.57	15	67
Eucinostomus gula	228	0.9	19.9	0.20	0.07	405.15	7.56	66	1.59	40	141
Eucinostomus harengulus	232	0.9	30.8	0.20	0.04	250.54	3.64	57	1.12	40	124
Subtotal	24,093	94.1	.	.	.	.	.	.	.	3	388
Totals	**25,651**	**100.0**	**.**	**22.52**	**3.69**	**204.78**	**358.47**	**.**	**.**	**3**	**780**

Table TB02-13. Catch statistics for Selected Taxa collected in 156 river 6.1-m otter trawl samples during Tampa Bay stratified-random sampling, 2002. 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	1,486	5.8	50.0	1.30	0.35	335.65	37.78	10	0.14	3	47
Cynoscion arenarius	834	3.3	35.9	0.73	0.18	302.63	16.73	43	1.03	10	178
Menticirrhus americanus	773	3.0	32.7	0.69	0.31	567.34	46.82	67	1.17	13	288
Callinectes sapidus	189	0.7	40.4	0.17	0.03	232.87	3.51	117	3.42	9	207
Sciaenops ocellatus	91	0.4	9.0	0.08	0.04	621.89	4.99	27	3.81	11	266
Archosargus probatocephalus	22	0.1	10.3	0.02	0.01	335.01	0.40	159	13.45	82	275
Leiostomus xanthurus	22	0.1	7.1	0.02	0.01	458.83	0.81	93	12.55	25	172
Cynoscion nebulosus	13	0.1	5.1	0.01	0.00	490.69	0.40	42	11.17	18	136
Paralichthys albigutta	8	0.0	3.8	0.01	0.00	577.40	0.40	249	24.11	131	333
Lutjanus griseus	7	0.0	2.6	0.01	0.00	637.56	0.27	106	8.36	77	136
Centropomus undecimalis	2	0.0	0.6	0.00	0.00	1,249.00	0.27	367	1.00	366	368
Elops saurus	1	0.0	0.6	0.00	0.00	1,249.00	0.13	30	.	30	30
Totals	**3,448**	**13.4**	**87.2**	**3.03**	**0.53**	**218.17**	**50.32**	**.**	**.**	**3**	**368**

Appendix TB02-01. Monthly summary of species collected during Tampa Bay stratified-random sampling, 2002. 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=100	E=100	E=100	E=105	E=100	E=100	E=100	E=100	E=100	E=120	E=115	E=100	E=1,240
Achirus lineatus	10	2	2	10	9	4	42	161	23	57	5	3	328
Aetobatis narinari	.	.	.	.	.	.	.	.	.	1	.	.	1
Aluterus schoepfi	.	.	1	.	.	1	.	5	6	3	1	3	20
Ameiurus nebulosus	.	.	.	.	.	.	.	.	.	2	.	.	2
Anchoa cubana	.	3	.	.	1	.	15	.	12	2,433	.	.	2,464
Anchoa hepsetus	.	8	.	1	123	3,432	187	93	7	7,567	7	.	11,425
Anchoa mitchilli	14,954	5,193	3,776	37,305	24,002	15,474	2,703	17,744	96,343	74,019	33,506	14,689	339,708
Anchoa spp.	.	.	.	.	.	.	1	.	.	2,051	105	.	2,157
Ancylopsetta quadrocellata	.	.	2	.	1	.	.	.	.	.	.	.	3
Archosargus probatocephalus	39	17	15	21	28	28	64	20	72	57	29	41	431
Arius felis	48	165	591	524	227	709	300	1,142	98	408	521	481	5,214
Bagre marinus	.	6	34	41	3	66	33	22	37	18	58	9	327
Bairdiella chrysoura	8	11	99	80	1,865	291	485	213	1,769	462	92	89	5,464
Balistidae spp.	.	.	1	.	.	.	.	.	.	.	.	.	1
Bathygobius soporator	4	4	3	1	.	.	1	.	2	1	1	6	23
Belonesox belizanus	13	.	.	.	4	.	.	.	.	.	3	13	33
Brevoortia spp.	.	113	69	29	5	16	143	10	511	9	2	5	912
Calamus arctifrons	2	1	1	.	.	.	.	2	1	9	2	.	18
Callinectes sapidus	94	54	120	184	89	26	19	33	11	20	30	32	712

Appendix TB02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=100	E=100	E=100	E=105	E=100	E=100	E=100	E=100	E=100	E=120	E=115	E=100	E=1,240
Caranx crysos	.	.	.	2	.	3	.	.	1	.	.	.	6
Caranx hippos	.	3	1	3	5	5	53	11	16	16	11	.	124
Caranx latus	.	.	.	.	.	.	.	.	.	1	.	.	1
Centropomus undecimalis	1	50	69	100	158	427	94	292	116	152	161	27	1,647
Centropristis striata	.	.	.	.	.	.	.	.	1	1	1	.	3
Chaetodipterus faber	.	3	4	11	11	42	45	48	44	485	22	3	718
Chasmodes saburrae	1	2	5	.	1	4	10	3	10	10	14	1	61
Chilomycterus schoepfi	48	48	32	19	31	29	32	71	51	93	39	68	561
Chloroscombrus chrysurus	2	.	.	6	797	314	64	7	23	140	46	.	1,399
Clupeidae spp.	.	.	.	.	.	.	3	.	.	.	.	.	3
Cynoscion arenarius	24	5	22	56	211	60	120	124	193	154	147	73	1,189
Cynoscion nebulosus	31	52	76	42	88	70	90	115	91	54	42	99	850
Cyprinodon variegatus	27	3	58	826	97	17	122	13	37	27	6	37	1,270
Dasyatis americana	.	.	2	.	3	4	1	.	.	.	.	.	10
Dasyatis sabina	59	30	40	52	33	74	21	27	18	84	35	44	517
Dasyatis say	4	1	.	3	.	39	12	10	3	3	2	1	78
Dasyatis spp.	.	.	.	.	.	1	.	.	.	1	.	.	2
Diapterus auratus	.	.	.	.	.	.	1	.	.	.	.	.	1
Diapterus plumieri	.	.	2	.	12	200	336	184	68	78	98	15	993
Diplectrum formosum	1	.	.	.	1	.	.	1	1	2	.	.	6

Appendix TB02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=100	E=100	E=100	E=105	E=100	E=100	E=100	E=100	E=100	E=120	E=115	E=100	E=1,240
Diplodus holbrooki	.	.	.	.	6	3	.	5	9	2	2	.	27
Dorosoma petenense	1	.	20	.	.	.	9	.	1	.	.	2	33
Echeneis neucratoides	.	.	.	2	.	.	.	1	2	2	1	.	8
Echeneis spp.	.	.	.	.	.	.	.	.	.	.	1	.	1
Elops saurus	12	258	309	2,128	49	166	130	61	260	171	146	80	3,770
Etropus crossotus	.	.	.	.	.	.	.	.	.	11	6	.	17
Eucinostomus argenteus	.	.	.	.	.	.	.	.	.	.	1	.	1
Eucinostomus gula	148	185	237	221	104	111	345	637	963	2,027	2,503	1,150	8,631
Eucinostomus harengulus	284	540	589	382	765	81	159	254	460	339	910	441	5,204
Eucinostomus spp.	232	227	78	142	.	1,163	2,242	2,548	3,071	3,630	3,729	3,021	20,083
Farfantepenaeus duorarum	42	59	41	17	12	765	1,708	191	845	715	623	111	5,129
Floridichthys carpio	128	2	109	78	60	1,092	102	146	86	99	133	153	2,188
Fundulus confluentus	.	.	1	.	.	.	.	.	.	.	.	.	1
Fundulus grandis	18	55	56	35	61	1	98	27	4	5	53	136	549
Fundulus majalis	2	558	83	332	1,249	4	147	76	.	69	61	35	2,616
Fundulus seminolis	.	.	.	.	.	.	.	2	1	.	6	1	10
Gambusia holbrooki	35	34	15	.	.	.	2	1	3	.	12	33	135
Ginglymostoma cirratum	.	.	.	.	.	1	.	.	.	.	.	.	1
Gobiesox strumosus	1	1	1	1	3	3	3	.	.	.	1	2	16
Gobionellus oceanicus	.	.	.	.	.	1	.	.	.	.	.	.	1

Appendix TB02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=100	E=100	E=100	E=105	E=100	E=100	E=100	E=100	E=100	E=120	E=115	E=100	E=1,240
Gobionellus smaragdus	.	.	.	.	.	.	.	6	.	1	1	.	8
Gobiosoma bosc	22	28	14	35	2	45	147	24	6	12	30	62	427
Gobiosoma robustum	7	40	41	38	3	106	14	13	4	6	21	2	295
Gobiosoma spp.	11	28	4	.	10	309	174	36	10	18	21	24	645
Gymnura micrura	.	4	2	4	.	5	1	2	1	.	.	4	23
Haemulon plumieri	.	1	1	.	.	2	4	3	19	8	1	.	39
Harengula jaguana	23	162	567	58	97	50	366	2,453	7,630	5,692	3,558	88	20,744
Hippocampus erectus	.	1	1	3	6	1	.	.	.	1	.	2	15
Hippocampus zosterae	1	.	4	.	7	1	4	.	2	3	.	.	22
Hyporhamphus meeki	1	6	5	1	6	12	1	2	4	30	22	1	91
Hypsoblennius hentzi	.	.	.	.	.	.	1	.	.	2	2	.	5
Lactophrys quadricornis	31	79	75	21	12	25	22	19	99	77	31	88	579
Lagodon rhomboides	191	2,903	5,896	2,367	2,033	1,984	1,174	6,063	3,375	4,179	2,553	720	33,438
Leiostomus xanthurus	3	1,063	1,614	317	155	356	63	178	158	186	26	1	4,120
Lepisosteus osseus	1	.	.	.	1	.	.	1	2	.	1	.	6
Lepisosteus platyrhincus	.	.	.	.	.	.	.	1	.	.	1	.	2
Lepomis macrochirus	.	4	.	.	.	.	.	.	.	.	.	.	4
Lepomis microlophus	1	.	.	.	.	.	.	.	.	.	.	.	1
Lepomis punctatus	.	.	.	.	.	.	.	.	.	.	.	1	1
Limulus polyphemus	7	16	20	67	9	4	2	5	5	43	14	3	195

Appendix TB02-01. (Continued)

Species	Month												Totals
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=100	**E=100**	**E=100**	**E=105**	**E=100**	**E=100**	**E=100**	**E=100**	**E=100**	**E=120**	**E=115**	**E=100**	**E=1,240**
Loricariidae spp.	.	.	.	.	.	.	.	1	.	.	.	.	1
Lucania parva	640	393	510	436	3,968	2,106	3,257	1,106	1,124	156	485	123	14,304
Lutjanus griseus	9	.	1	.	5	10	21	108	47	96	22	7	326
Lutjanus spp.	.	.	.	.	.	.	.	.	.	1	.	.	1
Lutjanus synagris	1	1	.	.	1	.	2	.	21	51	23	.	100
Membras martinica	.	1	.	3	43	1	328	7	.	.	.	.	383
Menidia spp.	755	1,158	2,460	3,894	3,953	4,072	6,298	2,280	3,272	2,440	1,980	907	33,469
Menippe spp.	.	.	1	1	.	3	1	2	.	8	8	.	24
Menticirrhus americanus	350	7	47	34	49	198	72	45	67	99	41	184	1,193
Menticirrhus littoralis	.	.	1	1	.	.	2	1	.	.	.	.	5
Menticirrhus saxatilis	2	3	1	3	6	.	1	.	.	.	2	1	19
Menticirrhus spp.	.	1	.	.	.	.	.	1	.	.	.	.	2
Microgobius gulosus	14	58	26	26	246	541	831	483	213	290	124	69	2,921
Microgobius thalassinus	.	.	3	2	1	.	28	1	.	1	.	.	36
Monacanthus hispidus	1	9	2	7	15	17	18	164	74	53	5	11	376
Mugil cephalus	68	272	487	209	115	36	46	87	40	162	74	42	1,638
Mugil curema	.	52	23	4	2	6	19	6	1	11	1	1	126
Mugil gyrans	8	34	20	51	23	27	20	6	28	86	25	15	343
Mycteroperca microlepis	.	.	.	.	.	9	2	9	21	8	4	.	53
Nicholsina usta	.	.	.	.	.	.	.	10	.	2	.	1	13

Appendix TB02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=100	E=100	E=100	E=105	E=100	E=100	E=100	E=100	E=100	E=120	E=115	E=100	E=1,240
Notropis petersoni	.	.	.	.	.	.	1	.	.	.	.	.	1
Ocyurus chrysurus	.	.	.	.	.	.	.	.	.	1	.	.	1
Oligoplites saurus	.	3	.	19	20	109	79	48	354	54	3	.	689
Opisthonema oglinum	.	3	81	840	266	2,072	1,038	779	113	590	252	.	6,034
Opsanus beta	2	2	13	13	17	11	8	39	5	20	36	4	170
Orthopristis chrysoptera	.	30	558	139	1,229	101	145	287	191	248	131	6	3,065
Paralichthys albigutta	13	8	10	9	8	16	8	8	11	8	8	3	110
Peprilus alepidotus	.	.	5	20	.	17	.	.	.	.	.	.	42
Poecilia latipinna	90	9	17	.	.	.	4	.	.	1	25	155	301
Pogonias cromis	.	.	.	.	.	1	.	11	1	2	4	3	22
Pomatomus saltatrix	.	.	.	2	2	.	.	10	1	4	.	1	20
Prionotus scitulus	10	20	18	13	17	35	32	18	26	108	146	19	462
Prionotus tribulus	7	4	1	3	.	6	4	3	1	8	14	16	67
Rachycentron canadum	.	.	.	.	1	1	.	1	1	1	2	.	7
Rhinobatos lentiginosus	.	2	2	4	1	.	1	1	2	1	1	.	15
Rhinoptera bonasus	8	13	51	110	34	151	97	43	80	38	36	18	679
Sardinella aurita	.	.	.	.	1	9	76	5	233	.	.	.	324
Sciaenops ocellatus	58	16	47	18	18	78	8	4	15	58	399	472	1,191
Scomberomorus maculatus	.	.	.	6	15	6	11	12	26	12	3	1	92
Selene vomer	.	.	.	1	.	5	28	20	37	3	1	.	95

Appendix TB02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=100	E=100	E=100	E=105	E=100	E=100	E=100	E=100	E=100	E=120	E=115	E=100	E=1,240
Sphoeroides nephelus	24	39	30	22	41	23	35	33	37	34	31	37	386
Sphoeroides spengleri	.	.	.	.	1	.	.	.	1	.	.	.	2
Sphyraena barracuda	.	.	.	.	.	.	.	5	2	11	2	1	21
Sphyraena borealis	.	.	.	.	10	3	.	.	.	.	.	.	13
Sphyrna tiburo	4	.	1	.	2	1	.	.	4	1	.	.	13
Strongylura marina	1	.	7	1	1	13	2	.	4	8	5	10	52
Strongylura notata	31	40	17	27	45	136	93	48	89	287	72	183	1,068
Strongylura spp.	.	.	.	15	26	8	2	1	1	2	.	.	55
Strongylura timucu	.	4	4	.	6	5	5	3	1	8	9	1	46
Symphurus plagiusa	1	5	3	3	1	15	33	17	1	24	9	18	130
Syngnathus floridae	.	1	2	1	.	8	1	6	3	2	3	9	36
Syngnathus louisianae	4	1	2	2	88	28	49	6	8	9	21	18	236
Syngnathus scovelli	29	32	69	45	88	100	131	16	22	8	54	16	610
Synodus foetens	10	19	16	24	34	27	34	23	24	83	69	32	395
Tilapia spp.	1	.	2	1	.	.	5	1	.	8	4	7	29
Trachinotus carolinus	.	8	1	2	.	.	4	4	4	2	.	.	25
Trachinotus falcatus	7	14	1	1	5	4	2	9	13	.	25	.	81
Trinectes maculatus	119	338	408	138	133	81	778	45	118	158	37	19	2,372
Urophycis floridana	2	.	.	.	.	.	.	.	.	.	.	.	2
Totals	**18,841**	**14,628**	**19,756**	**51,715**	**42,992**	**37,723**	**25,575**	**38,929**	**122,922**	**111,012**	**53,652**	**24,310**	**562,055**

Appendix TB02-02. Summary by gear, stratum, and zone of species collected during Tampa Bay stratified-random sampling, 2002. 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 183-m purse seine was post-stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 6.1-m otter trawl was not stratified. Zones A-E were located in Tampa Bay, and Zone F encompassed the lower Alafia (K), Little Manatee (L), Manatee (M), and Braden (N) Rivers. 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		183-m purse seine		6.1-m otter trawl							
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	Veg	Unveg		A	B	C	D	E	F	
	E=113	E=127	E=60	E=132	E=132	E=176	E=64	E=41	E=209	E=186	E=124	E=184	E=175	E=149	E=188	E=420	E=1,240
Achirus lineatus	14	19	19	49	49	5	1	3	11	158	12	17	17	13	17	252	328
Aetobatis narinari	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	1
Aluterus schoepfi	3	.	.	.	.	.	1	3	12	1	.	2	2	8	8	.	20
Ameiurus nebulosus	.	.	.	.	.	.	.	.	.	2	.	.	.	.	.	2	2
Anchoa cubana	12	19	2,433	.	.	.	.	.	.	.	3	12	1	2,433	15	.	2,464
Anchoa hepsetus	213	41	7,576	1,838	1,740	.	.	.	.	17	17	2	122	7,585	104	3,595	11,425
Anchoa mitchilli	14,317	4,897	30,899	97,630	176,406	.	.	.	.	15,559	14,055	463	3,790	28,971	3,103	289,326	339,708
Anchoa spp.	2,051	1	.	.	105	.	.	.	.	.	2,051	.	.	.	1	105	2,157
Ancylopsetta quadrocellata	.	.	.	.	.	.	.	.	3	.	.	2	.	1	.	.	3
Archosargus probatocephalus	14	1	13	18	15	159	129	2	58	22	4	133	46	112	81	55	431
Arius felis	619	30	1	98	1	778	415	379	2,368	525	1,105	790	816	744	1,146	613	5,214
Bagre marinus	.	3	.	.	.	54	13	3	189	65	31	8	195	10	18	65	327
Bairdiella chrysoura	2,056	240	157	277	1,589	324	54	376	234	157	286	680	429	649	1,417	2,003	5,464
Balistidae spp.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	.	1
Bathygobius soporator	.	.	1	7	14	.	.	.	.	1	.	.	.	.	1	22	23
Belonesox belizanus	.	.	.	25	8	.	.	.	.	.	.	.	.	.	.	33	33
Brevoortia spp.	.	2	.	1	5	528	19	6	349	2	4	20	95	768	17	8	912
Calamus arctifrons	4	.	.	.	.	1	2	8	3	.	.	2	.	1	15	.	18
Callinectes sapidus	12	16	9	29	53	104	82	23	189	195	69	31	93	80	168	271	712

Appendix TB02-02. (Continued)

Species	Gear and Strata										Zone						Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		183-m purse seine		6.1-m otter trawl							
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	Veg	Unveg		A	B	C	D	E	F	
	E=113	E=127	E=60	E=132	E=132	E=176	E=64	E=41	E=209	E=186	E=124	E=184	E=175	E=149	E=188	E=420	E=1,240
Caranx crysos	.	.	.	.	.	.	.	1	5	.	.	.	.	.	6	.	6
Caranx hippos	.	.	.	.	.	80	20	2	22	.	13	62	14	16	19	.	124
Caranx latus	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	.	1
Centropomus undecimalis	.	.	3	27	40	1,190	385	.	.	2	19	150	81	179	1,149	69	1,647
Centropristis striata	.	.	.	.	.	.	2	1	.	.	.	.	.	2	1	.	3
Chaetodipterus faber	10	5	9	.	5	510	50	29	55	45	17	84	98	76	422	21	718
Chasmodes saburrae	30	10	11	1	1	.	.	.	.	8	17	17	11	3	7	6	61
Chilomycterus schoepfi	30	4	6	1	.	42	28	161	259	30	23	108	39	249	131	11	561
Chloroscombrus chrysurus	3	1	.	.	.	143	36	75	1,136	5	5	855	340	51	148	.	1,399
Clupeidae spp.	.	3	.	.	.	.	.	.	.	.	.	.	.	.	3	.	3
Cynoscion arenarius	6	6	1	27	64	5	2	9	195	874	46	14	114	72	18	925	1,189
Cynoscion nebulosus	220	42	81	44	63	61	52	73	201	13	142	84	95	239	170	120	850
Cyprinodon variegatus	2	2	1,115	36	107	8	.	.	.	.	85	25	4	874	139	143	1,270
Dasyatis americana	.	.	.	.	.	3	1	1	5	.	.	2	1	3	4	.	10
Dasyatis sabina	2	3	1	5	5	116	51	16	206	112	54	94	190	21	62	96	517
Dasyatis say	1	.	.	.	.	40	10	2	21	4	5	30	16	7	18	2	78
Dasyatis spp.	.	.	.	.	.	1	.	.	1	.	.	.	.	.	2	.	2
Diapterus auratus	.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	1
Diapterus plumieri	2	45	2	503	157	136	8	.	.	140	39	74	27	.	53	800	993
Diplectrum formosum	1	.	.	.	.	.	.	1	3	1	.	.	.	2	3	1	6
Diplodus holbrooki	4	.	3	.	.	5	3	4	8	.	.	9	.	12	6	.	27
Dorosoma petenense	.	2	.	9	.	1	.	.	21	.	1	.	14	.	9	9	33
Echeneis neucratoides	.	.	.	.	.	.	.	1	6	1	.	5	.	.	3	.	8
Echeneis spp.	.	.	.	.	.	.	.	.	1	.	.	.	1	.	.	.	1
Elops saurus	.	.	1	84	8	370	51	214	3,041	1	207	2,612	196	435	227	93	3,770

Appendix TB02-02. (Continued)

Species	Gear and Strata										Zone						Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		183-m purse seine		6.1-m otter trawl							
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	Veg	Unveg		A	B	C	D	E	F	
	E=113	E=127	E=60	E=132	E=132	E=176	E=64	E=41	E=209	E=186	E=124	E=184	E=175	E=149	E=188	E=420	E=1,240
Etropus crossotus	.	1	.	.	.	.	.	.	.	16	.	4	.	5	8	.	17
Eucinostomus argenteus	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	1
Eucinostomus gula	1,205	235	716	356	620	3,257	817	174	684	567	714	1,936	1,099	1,868	1,810	1,204	8,631
Eucinostomus harengulus	18	123	363	1,644	1,535	738	377	1	170	235	348	428	314	266	437	3,411	5,204
Eucinostomus spp.	4,420	1,374	4,475	3,760	3,759	.	.	.	1	2,294	692	1,286	864	2,517	4,931	9,793	20,083
Farfantepenaeus duorarum	1,302	497	605	517	534	56	9	4	26	1,579	150	198	670	505	1,069	2,537	5,129
Floridichthys carpio	211	59	1,684	28	164	33	9	.	.	.	845	54	44	405	648	192	2,188
Fundulus confluentus	.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	1
Fundulus grandis	1	.	42	178	304	20	4	.	.	.	9	.	1	27	30	482	549
Fundulus majalis	.	1	137	313	2,129	32	4	.	.	.	43	3	3	121	4	2,442	2,616
Fundulus seminolis	.	.	.	2	8	.	.	.	.	.	.	.	.	.	.	10	10
Gambusia holbrooki	.	.	.	112	23	.	.	.	.	.	.	.	.	.	.	135	135
Ginglymostoma cirratum	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	1
Gobiesox strumosus	.	.	1	5	1	1	.	.	.	8	2	.	1	.	.	13	16
Gobionellus oceanicus	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	1
Gobionellus smaragdus	.	.	.	8	.	.	.	.	.	.	.	.	.	.	.	8	8
Gobiosoma bosc	.	.	.	305	86	.	.	.	.	36	.	.	.	.	.	427	427
Gobiosoma robustum	189	81	13	5	3	.	.	.	.	4	43	28	20	34	161	9	295
Gobiosoma spp.	105	230	13	198	51	.	.	.	.	48	53	30	18	.	251	293	645
Gymnura micrura	.	.	.	.	.	4	5	2	11	1	3	3	9	5	2	1	23
Haemulon plumieri	10	.	.	.	.	2	17	6	4	.	.	5	.	25	9	.	39
Harengula jaguana	8,814	14	1,165	615	1,848	7,055	64	248	896	25	6,572	3,308	490	4,969	2,918	2,487	20,744
Hippocampus erectus	9	2	.	.	.	1	1	.	2	.	.	4	.	4	7	.	15
Hippocampus zosterae	14	4	4	.	.	.	.	.	.	.	1	4	.	3	14	.	22
Hyporhamphus meeki	26	5	.	.	.	48	12	.	.	.	45	9	2	8	27	.	91

Appendix TB02-02. (Continued)

Species	Gear and Strata										Zone						Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		183-m purse seine		6.1-m otter trawl							
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	Veg	Unveg		A	B	C	D	E	F	
	E=113	E=127	E=60	E=132	E=132	E=176	E=64	E=41	E=209	E=186	E=124	E=184	E=175	E=149	E=188	E=420	E=1,240
Hypsoblennius hentzi	2	3	.	.	.	.	.	.	.	.	2	1	.	.	2	.	5
Lactophrys quadricornis	20	16	.	.	.	50	90	95	301	7	10	197	51	122	199	.	579
Lagodon rhomboides	8,626	930	1,292	1,175	797	7,249	8,081	2,600	2,295	393	585	5,791	532	14,920	9,317	2,293	33,438
Leiostomus xanthurus	70	23	542	537	985	231	235	225	1,250	22	12	125	111	1,422	906	1,544	4,120
Lepisosteus osseus	.	.	.	.	2	.	.	.	2	2	.	.	2	.	.	4	6
Lepisosteus platyrhincus	.	.	.	.	2	.	.	.	.	.	.	.	.	.	.	2	2
Lepomis macrochirus	.	.	.	4	.	.	.	.	.	.	.	.	.	.	.	4	4
Lepomis microlophus	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	1
Lepomis punctatus	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	1
Limulus polyphemus	1	6	.	1	.	75	6	6	39	61	44	5	56	22	48	20	195
Loricariidae spp.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	.	1	1
Lucania parva	3,638	363	4,562	2,055	3,537	.	.	.	.	149	3,516	743	878	1,760	1,667	5,740	14,304
Lutjanus griseus	43	3	18	3	10	139	81	11	10	8	.	53	7	140	106	20	326
Lutjanus spp.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	.	1
Lutjanus synagris	27	5	.	.	.	11	23	21	7	6	.	5	9	49	37	.	100
Membras martinica	3	45	328	3	4	.	.	.	.	.	330	3	43	.	.	7	383
Menidia spp.	1,012	864	4,743	12,425	14,418	.	.	.	.	7	2,174	1,704	418	1,250	1,073	26,850	33,469
Menippe spp.	.	1	.	.	.	.	1	.	7	15	3	6	6	2	7	.	24
Menticirrhus americanus	10	25	2	6	62	3	3	116	158	808	41	12	102	47	150	841	1,193
Menticirrhus littoralis	.	.	.	.	.	2	1	1	1	.	.	.	.	5	.	.	5
Menticirrhus saxatilis	4	6	2	1	.	.	.	.	6	.	.	2	5	4	7	1	19
Menticirrhus spp.	1	.	.	.	.	.	.	.	.	1	.	.	.	1	.	1	2
Microgobius gulosus	609	423	229	809	589	.	.	.	.	262	372	301	269	30	296	1,653	2,921
Microgobius thalassinus	.	.	.	.	1	.	.	.	.	35	.	.	.	.	.	36	36
Monacanthus hispidus	44	5	5	.	.	17	23	107	169	6	1	35	5	161	172	2	376

Appendix TB02-02. (Continued)

Species	Gear and Strata										Zone						Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		183-m purse seine		6.1-m otter trawl							
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	Veg	Unveg		A	B	C	D	E	F	
	E=113	E=127	E=60	E=132	E=132	E=176	E=64	E=41	E=209	E=186	E=124	E=184	E=175	E=149	E=188	E=420	E=1,240
Mugil cephalus	10	76	188	312	395	412	237	.	8	.	287	78	110	277	179	707	1,638
Mugil curema	.	.	2	.	.	98	24	2	.	.	7	9	35	21	54	.	126
Mugil gyrans	.	.	1	12	24	255	45	.	6	.	21	45	48	29	164	36	343
Mycteroperca microlepis	8	.	.	.	.	12	27	1	5	.	.	.	.	28	25	.	53
Nicholsina usta	1	.	.	.	.	.	.	2	10	.	.	1	.	.	12	.	13
Notropis petersoni	.	.	.	.	.	.	.	.	.	1	.	.	.	.	.	1	1
Ocyurus chrysurus	.	.	.	.	.	.	.	1	.	.	.	.	.	.	1	.	1
Oligoplites saurus	21	17	51	57	126	363	25	2	25	2	51	35	35	353	30	185	689
Opisthonema oglinum	459	7	138	1	553	11	5	206	4,651	3	517	1,122	456	479	2,903	557	6,034
Opsanus beta	12	4	2	10	7	35	33	11	38	18	17	12	4	75	30	32	170
Orthopristis chrysoptera	1,829	31	62	2	38	144	222	285	342	110	13	233	128	1,230	1,404	57	3,065
Paralichthys albigutta	1	4	5	2	.	20	23	16	25	14	1	21	10	43	25	10	110
Peprilus alepidotus	.	.	.	.	.	.	.	.	42	.	9	.	22	.	11	.	42
Poecilia latipinna	.	.	.	107	186	7	.	.	.	1	.	.	3	3	1	294	301
Pogonias cromis	.	1	.	.	.	19	2	.	.	.	1	2	11	2	6	.	22
Pomatomus saltatrix	.	.	.	.	.	.	.	6	14	.	.	2	3	8	7	.	20
Prionotus scitulus	7	38	4	1	2	4	9	23	152	222	28	125	137	50	89	33	462
Prionotus tribulus	3	3	.	1	3	2	7	2	12	34	4	4	13	10	6	30	67
Rachycentron canadum	.	.	.	.	.	2	1	1	3	.	.	3	1	.	3	.	7
Rhinobatos lentiginosus	.	.	.	.	.	5	.	.	10	.	.	3	7	.	5	.	15
Rhinoptera bonasus	.	2	.	.	1	230	117	6	323	.	111	140	293	42	92	1	679
Sardinella aurita	309	5	.	1	.	.	.	.	9	.	.	.	.	303	20	1	324
Sciaenops ocellatus	74	44	81	398	323	149	31	.	.	91	168	55	66	6	84	812	1,191
Scomberomorus maculatus	.	.	.	.	.	39	3	7	43	.	1	25	9	33	24	.	92
Selene vomer	.	.	.	.	.	33	35	13	14	.	17	47	1	20	10	.	95

Appendix TB02-02. (Continued)

Species	Gear and Strata										Zone						Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		183-m purse seine		6.1-m otter trawl							
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	Veg	Unveg		A	B	C	D	E	F	
	E=113	E=127	E=60	E=132	E=132	E=176	E=64	E=41	E=209	E=186	E=124	E=184	E=175	E=149	E=188	E=420	E=1,240
Sphoeroides nephelus	91	36	30	19	16	61	53	25	19	36	49	71	24	55	117	70	386
Sphoeroides spengleri	1	.	1	.	.	.	.	.	.	.	.	.	.	2	.	.	2
Sphyraena barracuda	.	.	.	.	.	16	5	.	.	.	.	10	.	5	6	.	21
Sphyraena borealis	13	.	.	.	.	.	.	.	.	.	.	.	.	3	10	.	13
Sphyrna tiburo	.	.	.	.	.	2	.	4	7	.	.	4	5	1	3	.	13
Strongylura marina	10	5	4	1	5	22	5	.	.	.	17	13	1	8	7	6	52
Strongylura notata	47	35	65	36	51	769	65	.	.	.	374	274	43	29	261	87	1,068
Strongylura spp.	1	.	8	30	16	.	.	.	.	.	.	9	.	.	.	46	55
Strongylura timucu	1	2	5	15	21	2	.	.	.	.	2	3	1	1	3	36	46
Symphurus plagiusa	9	13	5	6	11	.	.	1	14	71	12	4	22	3	7	82	130
Syngnathus floridae	28	.	4	.	.	.	.	.	3	1	1	9	.	19	7	.	36
Syngnathus louisianae	174	34	8	.	8	.	.	.	.	12	15	66	85	27	29	14	236
Syngnathus scovelli	373	106	46	30	36	.	.	1	1	17	121	142	43	44	178	82	610
Synodus foetens	55	110	22	20	23	21	25	27	46	46	43	86	71	59	72	64	395
Tilapia spp.	.	.	.	6	4	19	.	.	.	.	3	13	.	1	2	10	29
Trachinotus carolinus	.	.	.	.	.	1	3	2	19	.	.	10	4	2	9	.	25
Trachinotus falcatus	.	.	.	.	.	24	41	.	16	.	1	1	8	63	8	.	81
Trinectes maculatus	.	1	1	253	218	2	1	2	4	1,890	4	.	7	.	4	2,357	2,372
Urophycis floridana	1	1	.	.	.	.	.	.	.	.	.	1	.	1	.	.	2
Totals	**53,598**	**11,311**	**64,015**	**127,097**	**213,975**	**26,469**	**12,323**	**5,656**	**20,505**	**27,106**	**36,815**	**25,351**	**14,582**	**77,649**	**40,935**	**366,723**	**562,055**

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Charlotte Harbor

Charlotte Harbor is one of the most pristine bay systems in the state (Florida Department of Natural Resources 1983), and approximately 90% of its waters are designated as aquatic preserves. Charlotte Harbor is connected to the Gulf of Mexico by Boca Grande Pass, San Carlos Bay, and several smaller inlets and receives freshwater inflow from the Peace, Caloosahatchee, and Myakka rivers. The only substantial urban developments occur at the mouths of the Peace (Port Charlotte and Punta Gorda) and Caloosahatchee (Fort Myers and Cape Coral) rivers; however, rapid population growth and development in the Charlotte Harbor area and watershed have resulted in increased stress on this estuarine system (Hammett 1990; Charlotte Harbor National Estuary Program 2000). It is estimated that between 1945 and 1982, 29% of Charlotte Harbor's seagrass beds were lost (Harris et al. 1983), although overall seagrass coverage appears to have remained stable in more recent years (Tomasko 2003).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive ichthyological sampling in Charlotte Harbor since 1989. This section summarizes FIM program data collected in Charlotte Harbor during 2002. The area sampled was divided into four bay zones (A-D) and a riverine zone (F) that encompassed the lower Myakka (M) and Peace (P) Rivers (Figure CH02-01). Monthly stratified-random sampling (SRS), stratified by zone and depth, was conducted year-round using 21.3-m seines, 183-m haul seines, 183-m purse seines, and 6.1-m otter trawls. The 21.3-m and 183-m haul seine samples were also stratified by habitat type. The 6.1-m otter trawl sampling was conducted year-round in the rivers, but was limited to the fall season (October-November) in Charlotte Harbor proper (Zones A-C only). All methods used were the same as those described in the Methods section of this report.

Stratified-Random Sampling

A total of 217,340 fish and selected invertebrates were collected during Charlotte Harbor SRS in 2002 (Table CH02-01; Appendices CH02-01 and -02). A total of 128 species were represented in 918 samples. As in previous years, small forage fishes were collected in the largest numbers. *Lucania parva* (n=49,750), *Lagodon rhomboides* (n=34,286), the mojarras (*Eucinostomus* spp., *Eucinostomus gula,* and *Eucinostomus harengulus,* and *Eucinostomus jonesi*; n=33,157), *Anchoa mitchilli* (n=29,018), *Opisthonema oglinum* (n=14,792), and *Menidia* spp. (n=14,407) together comprised 80.7% of the year's total catch. Monthly catch totals were lowest during January (n=4,134) and February (n=5,488), and highest in October (n=38,733) and May (n=35,338). Selected Taxa (15,007 individuals; 27 taxa) accounted for 6.9% of the total catch. The most abundant Selected Taxa were *Farfantepenaeus duorarum* (n=4,227), *Cynoscion arenarius* (n=2,610), *Mugil cephalus* (n=1,316), *Centropomus undecimalis* (n=884), *Elops saurus* (n=792), and *Sciaenops ocellatus* (n=717). A spinner shark (*Carcharhinus brevipinna*) captured with the purse seine in Pine Island Sound (Zone D) represents a species new to Charlotte Harbor FIM collections.

Bay Sampling

21.3-m Bay Seines. Over half (n=123,003 animals; 56.6%) of this year's total SRS catch was collected with 21.3-m bay seines (288 samples; Tables CH02-01 and -02). *Lucania parva* (n=49,712), *Eucinostomus* spp. (n=18,830), *L. rhomboides* (n=12,103), *Menidia* spp. (n=11,188), and *A. mitchilli* (n=8,381) were the most numerous taxa. *Microgobius gulosus* (n=3,943), *E. gula* (n=3,317), and *F. duorarum* (n=2,862) were also collected in large numbers.

Twenty-one Selected Taxa (n=4,258) comprised 3.5% of the 21.3-m bay seine catch (Table CH02-03). Most numerous (n=2,862) and frequently taken (51.0% occurrence) was *F. duorarum*, which accounted for about two-thirds (67.2%) of the Selected Taxa. *Sciaenops ocellatus* (n=333) and *Cynoscion nebulosus* (n=320) ranked next in abundance. *Leiostomus xanthurus*, the most abundant Selected Taxon in bay seine samples during 2001(n=6,154), was collected in 2002 in relatively low numbers (n=153) this year.

183-m Haul Seines. A total of 25,313 animals were collected with 183-m haul seines (n=204 hauls; Tables CH02-01 and -04). *Lagodon rhomboides* (n=15,989) accounted for 63.2% of the total catch and were collected in almost two-thirds (60.3%) of the 183-m haul seine samples. *Eucinostomus gula* (n=1,481), *Bairdiella chrysoura* (n=1,104)*, C.*

undecimalis (n=864), and *Archosargus probatocephalus* (n=543) were also taken in large numbers. Most of the *C. undecimalis* collected in Charlotte Harbor this year (97.7%) were taken with 183-m haul seines.

More Selected Taxa (n=23) were represented in 183-m haul seine collections than in those of any other gear (Table CH02-05). Besides *C. undecimalis* and *A. probatocephalus*, *Lutjanus* griseus (n=336), *Mycteroperca microlepis* (n=286), *M. cephalus* (n=219), and *C. nebulosus* (n=217) were the most numerous. *Pogonias cromis* (n=1) was collected exclusively with this gear.

183-m Purse Seines. A total of 27,528 animals were collected in 240 183-m purse seine hauls made during 2002 (Tables CH02-01 and -06). *Opisthonema oglinum* comprised over half of the purse seine catch (n=14,635; 53.2%), and were the most frequently captured (42.9% occurrence). *Lagodon rhomboides* (n=5,733), *Harengula jaguana* (n=779), and *B. chrysoura* (n=638) were also well represented in the purse seine samples.

Twenty Selected Taxa (n=2,618) were collected in purse seines. *Cynoscion arenarius* (n=1,270), *E. saurus* (n=604), *Menticirrhus americanus* (n=303), and *C. nebulosus* (n=100) were the most numerous and frequently captured (Table CH02-07). *Pomatomus saltatrix* (n=17) and *Epinephelus morio* (n=3) were collected only in purse nets.

Seasonal 6.1-m Bay Otter Trawls. The 18 seasonal 6.1-m bay otter trawl samples, deployed in October and November, collected 2,552 animals (Table CH02-08). *Eucinostomus* spp. were collected in 50.0% of these samples and were the most numerous taxon (n=1,022). *Lagodon rhomboides* (n=335), *A. mitchilli* (n=310), and *E. gula* (n=126) ranked next in abundance.

Ten Selected Taxa (n=312) were collected in seasonal 6.1-m bay otter trawls (Table CH02-09). The most numerous were *M. americanus* (n=106), *C. arenarius* (n=103), *F. duorarum* (n=59), and *Lutjanus synagris* (n=34), which together comprised 96.8% of the Selected Taxa catch.

River Sampling

21.3-m River Seines. A total of 31,433 animals, or 14.5% of the total yearly SRS catch, were collected with 21.3-m river seines (96 hauls; Table CH02-10). *Anchoa mitchilli* dominated these collections (n=16,679; 53.1% of 21.3-m river seine catch), as in all past years of Charlotte Harbor SRS. *Eucinostomus* spp. (n=4,854), *Menidia* spp. (n=3,219), *Fundulus majalis* (n=894), and *E. harengulus* (n=875) were also collected in large numbers. *Menidia* spp. was collected most frequently (84.4% occurrence).

Thirteen Selected Taxa (n=2,671) accounted for 8.5% of the 21.3-m river seine catch (Table CH02-11). The most numerous was *M. cephalus* (n=1,068), followed by *F. duorarum* (n=628), *C. arenarius* (n=456), and *S. ocellatus* (n=295).

6.1-m River Otter Trawls. A total of 7,511 animals were collected in 72 6.1-m river otter trawl samples (Table CH02-12). *Anchoa mitchilli* (n=3,648) accounted for about half (48.6%) of the catch. *Trinectes maculatus* ranked next in abundance (n=1,137) and was the most frequently collected species (56.9% occurrence).

A portion of the 6.1-m river otter trawl catch (n=1,698; 22.6%) consisted of Selected Taxa (Table CH02-13). Four of the nine Selected Taxa, *C. arenarius* (n=734), *F. duorarum* (n=663), *M. americanus* (n=200), and *C. sapidus* (n=87), comprised most (99.2%) of the Selected Taxa. Of the Selected Taxa, only *F. duorarum* and *C. arenarius* were collected in over half of these samples.

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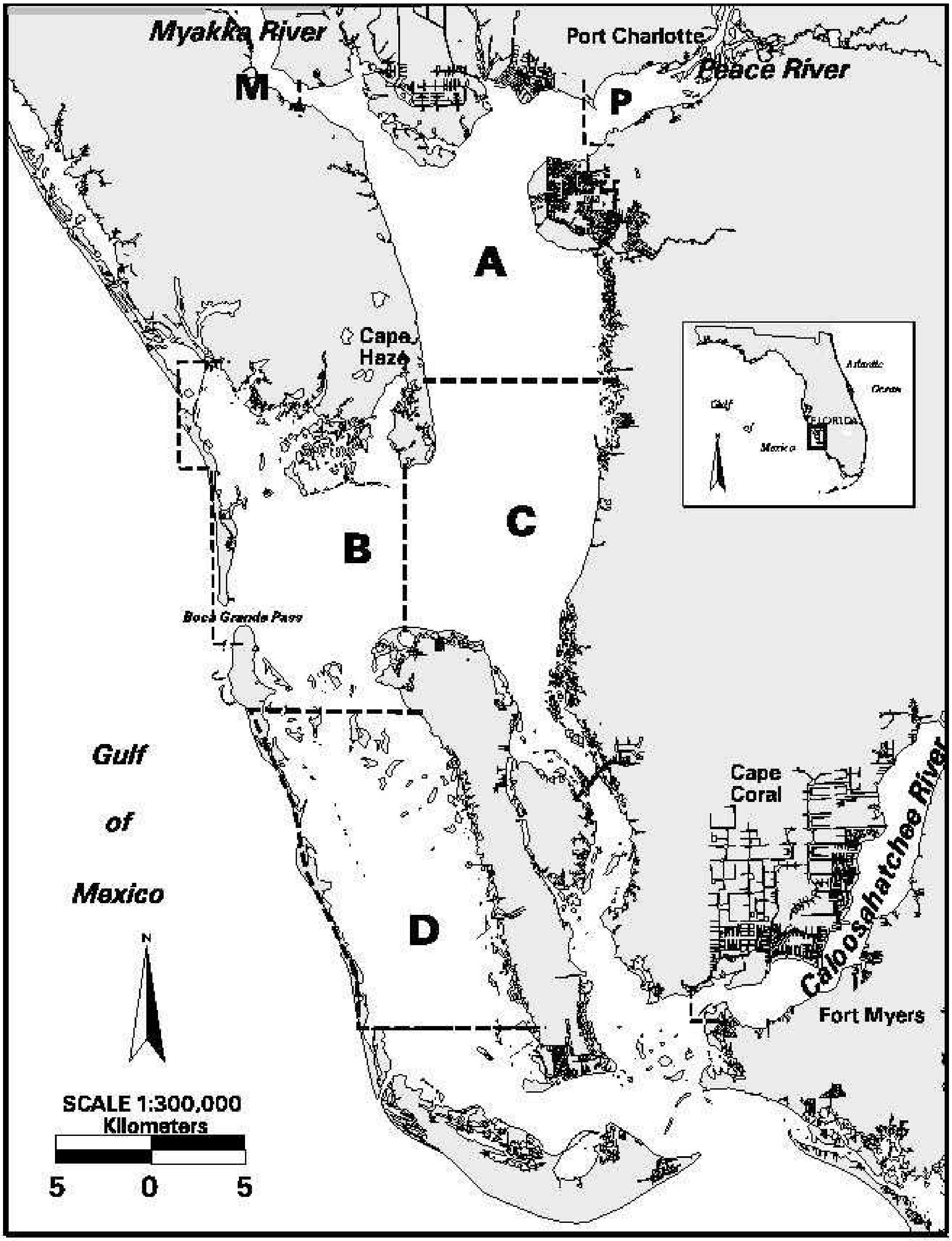

Figure CH02-01. Map of Charlotte Harbor sampling area. Zones are labeled A-D, M and P.

Table CH02-01. Summary of catch and effort data for Charlotte Harbor stratified-random sampling, 2002. Zones A-D were located in the bay, and Zones M and P encompassed the Myakka (Zone M) and lower Peace (Zone P) Rivers.

Zone	21.3-m bay seine		21.3-m river seine		183-m haul seine		183-m purse seine		6.1-m otter trawl		Totals	
	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls
A	19,080	96	.	.	1,063	60	3,283	60	1,707	6	25,133	222
B	46,784	96	.	.	11,592	48	4,938	60	595	6	63,909	210
C	57,139	96	.	.	3,283	48	5,321	60	250	6	65,993	210
D	.	.	.	.	9,375	48	13,986	60	.	.	23,361	108
M	.	.	9,083	48	.	.	.	.	3,948	36	13,031	84
P	.	.	22,350	48	.	.	.	.	3,563	36	25,913	84
Totals	**123,003**	**288**	**31,433**	**96**	**25,313**	**204**	**27,528**	**240**	**10,063**	**90**	**217,340**	**918**

Table CH02-02. Catch statistics for 10 dominant taxa collected in 288 21.3-m bay seine samples during Charlotte Harbor stratified-random sampling, 2002. 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
Lucania parva	49,712	40.4	44.4	123.29	55.05	757.69	15,268.57	21	0.02	11	45
Eucinostomus spp.	18,830	15.3	63.2	46.70	7.07	256.98	1,451.43	28	0.05	9	41
Lagodon rhomboides	12,103	9.8	55.9	30.02	4.99	281.96	720.00	40	0.13	12	187
Menidia spp.	11,188	9.1	34.0	27.75	9.44	577.10	2,154.29	44	0.09	16	81
Anchoa mitchilli	8,381	6.8	13.5	20.79	13.83	1,129.14	3,920.00	29	0.05	17	65
Microgobius gulosus	3,943	3.2	48.6	9.78	1.62	281.86	245.71	29	0.11	11	58
Eucinostomus gula	3,317	2.7	49.3	8.23	1.21	250.02	211.43	52	0.16	34	88
Farfantepenaeus duorarum	2,862	2.3	51.0	7.10	1.92	458.94	520.00	10	0.08	3	35
Floridichthys carpio	1,729	1.4	18.1	4.29	1.40	552.07	302.86	26	0.23	9	60
Eucinostomus harengulus	1,540	1.3	30.9	3.82	1.03	455.73	257.14	56	0.29	36	98
Subtotal	113,605	92.3	.	.	.	.	.	.	.	3	187
Totals	**123,003**	**100.0**	**.**	**305.07**	**64.05**	**356.28**	**16,782.86**	**.**	**.**	**3**	**600**

Table CH02-03. Catch statistics for Selected Taxa collected in 288 21.3-m bay seine samples during Charlotte Harbor stratified-random sampling, 2002. 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	2,862	2.3	51.0	7.10	1.92	458.94	520.00	10	0.08	3	35
Sciaenops ocellatus	333	0.3	11.1	0.83	0.27	554.70	65.71	27	1.35	11	365
Cynoscion nebulosus	320	0.3	26.7	0.79	0.12	250.56	14.29	41	1.06	13	149
Leiostomus xanthurus	153	0.1	6.6	0.38	0.18	789.58	38.57	32	0.96	11	83
Lutjanus griseus	147	0.1	13.5	0.36	0.12	565.37	30.71	53	2.93	10	184
Lutjanus synagris	100	0.1	7.3	0.25	0.08	549.10	16.43	30	1.34	16	77
Archosargus probatocephalus	66	0.1	12.2	0.16	0.04	398.10	7.86	83	10.79	17	339
Callinectes sapidus	62	0.1	12.2	0.15	0.03	332.05	4.29	48	5.52	8	172
Cynoscion arenarius	47	0.0	3.5	0.12	0.07	1,049.15	20.00	24	0.91	16	44
Mugil gyrans	39	0.0	3.1	0.10	0.05	905.71	13.57	21	3.34	14	119
Menticirrhus americanus	29	0.0	2.8	0.07	0.03	746.31	7.14	27	2.55	13	63
Mugil cephalus	29	0.0	2.1	0.07	0.05	1,084.22	12.14	47	11.33	20	342
Centropomus undecimalis	19	0.0	1.7	0.05	0.03	970.89	5.71	228	44.08	36	476
Mycteroperca microlepis	16	0.0	3.1	0.04	0.01	611.39	2.14	128	12.07	30	182
Mugil curema	14	0.0	0.7	0.03	0.03	1,580.07	9.29	60	5.34	19	110
Paralichthys albigutta	7	0.0	1.7	0.02	0.01	799.22	1.43	72	15.07	36	156

Table CH02-03. (Continued)

Species	Number No.	%	% Occur	Density Estimate (animals/100m^2) Mean	Stderr	CV	Max	Standard Length (mm) Mean	Stderr	Min	Max
Menticirrhus saxatilis	6	0.0	1.7	0.01	0.01	795.11	1.43	28	5.03	19	47
Elops saurus	3	0.0	1.0	0.01	0.00	976.38	0.71	230	41.43	153	295
Trachinotus carolinus	3	0.0	0.3	0.01	0.01	1,697.06	2.14	44	5.61	33	52
Menippe spp.	2	0.0	0.7	0.00	0.00	1,197.91	0.71	38	9.50	28	47
Trachinotus falcatus	1	0.0	0.3	0.00	0.00	1,697.06	0.71	22	.	22	22
Totals	**4,258**	**3.5**	**77.8**	**10.56**	**2.04**	**327.16**	**524.29**	**.**	**.**	**3**	**476**

Table CH02-04. Catch statistics for 10 dominant taxa collected in 204 183-m haul seine samples during Charlotte Harbor stratified-random sampling, 2002. 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	15,989	63.2	60.3	78.38	12.83	233.80	1,257.00	96	0.16	43	215
Eucinostomus gula	1,481	5.9	42.2	7.26	1.44	283.07	160.00	81	0.23	47	113
Bairdiella chrysoura	1,104	4.4	15.7	5.41	2.13	562.97	272.00	117	0.40	10	168
Centropomus undecimalis	864	3.4	42.6	4.24	0.98	331.41	134.00	463	3.26	122	890
Archosargus probatocephalus	543	2.1	42.2	2.66	0.71	382.78	133.00	232	3.20	58	426
Harengula jaguana	419	1.7	11.8	2.05	0.80	559.30	111.00	104	0.62	82	192
Eucinostomus harengulus	400	1.6	21.1	1.96	0.79	572.18	149.00	93	0.39	47	118
Orthopristis chrysoptera	383	1.5	17.6	1.88	0.67	508.47	89.00	104	0.94	71	166
Diapterus plumieri	371	1.5	14.7	1.82	1.03	807.45	206.00	157	2.21	32	232
Lutjanus griseus	336	1.3	34.8	1.65	0.28	244.15	29.00	143	1.85	74	329
Subtotal	21,890	86.6	.	.	.	.	.	.	.	10	890
Totals	**25,313**	**100.0**	**.**	**124.08**	**15.22**	**175.18**	**1,368.00**	**.**	**.**	**10**	**1160**

Table CH02-05. Catch statistics for Selected Taxa collected in 204 183-m haul seine samples during Charlotte Harbor stratified-random sampling, 2002. 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	864	3.4	42.6	4.24	0.98	331.41	134.00	463	3.26	122	890
Archosargus probatocephalus	543	2.1	42.2	2.66	0.71	382.78	133.00	232	3.20	58	426
Lutjanus griseus	336	1.3	34.8	1.65	0.28	244.15	29.00	143	1.85	74	329
Mycteroperca microlepis	286	1.1	18.6	1.40	0.32	329.47	36.00	173	2.36	86	362
Mugil cephalus	219	0.9	38.7	1.07	0.14	184.44	15.00	316	3.99	97	440
Cynoscion nebulosus	217	0.9	16.7	1.06	0.49	660.15	81.00	260	5.73	86	540
Elops saurus	185	0.7	22.1	0.91	0.33	526.13	64.00	309	4.25	171	434
Trachinotus falcatus	162	0.6	5.9	0.79	0.42	759.75	67.00	208	5.37	43	325
Leiostomus xanthurus	138	0.5	8.3	0.68	0.34	718.72	58.00	98	1.27	75	161
Callinectes sapidus	134	0.5	23.0	0.66	0.17	368.59	26.00	107	2.95	35	190
Lutjanus synagris	100	0.4	6.9	0.49	0.18	525.49	22.00	95	1.44	72	165
Mugil gyrans	91	0.4	11.8	0.45	0.12	384.25	17.00	172	4.09	75	296
Sciaenops ocellatus	85	0.3	21.1	0.42	0.07	250.74	6.00	403	13.14	106	699
Mugil curema	45	0.2	7.4	0.22	0.08	498.10	11.00	196	7.37	122	323
Paralichthys albigutta	17	0.1	7.4	0.08	0.02	372.71	2.00	233	16.46	69	316
Farfantepenaeus duorarum	12	0.0	3.4	0.06	0.02	575.87	3.00	31	1.82	21	41

Table CH02-05. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Scomberomorus maculatus	6	0.0	2.5	0.03	0.01	667.47	2.00	375	52.66	225	533
Epinephelus itajara	4	0.0	1.0	0.02	0.02	1,127.49	3.00	265	20.10	210	295
Menippe spp.	2	0.0	1.0	0.01	0.01	1,007.46	1.00	44	1.50	42	45
Rachycentron canadum	1	0.0	0.5	0.00	0.00	1,428.29	1.00	920	.	920	920
Trachinotus carolinus	1	0.0	0.5	0.00	0.00	1,428.29	1.00	259	.	259	259
Menticirrhus americanus	1	0.0	0.5	0.00	0.00	1,428.29	1.00	261	.	261	261
Pogonias cromis	1	0.0	0.5	0.00	0.00	1,428.29	1.00	245	.	245	245
Totals	**3,450**	**13.6**	**93.1**	**16.91**	**1.87**	**157.70**	**155.00**	**.**	**.**	**21**	**920**

Table CH02-06. Catch statistics for 10 dominant taxa collected in 240 183-m purse seine samples during Charlotte Harbor stratified-random sampling, 2002. 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
Opisthonema oglinum	14,635	53.2	42.9	60.98	19.99	507.86	3,431.00	138	0.08	82	181
Lagodon rhomboides	5,733	20.8	35.4	23.89	4.33	280.54	442.00	101	0.15	41	165
Cynoscion arenarius	1,270	4.6	13.3	5.29	1.87	546.75	271.00	177	0.79	121	302
Harengula jaguana	779	2.8	19.6	3.25	0.86	411.88	121.00	113	0.45	87	147
Bairdiella chrysoura	638	2.3	8.8	2.66	2.14	1,248.74	512.00	141	0.55	98	165
Elops saurus	604	2.2	28.3	2.52	0.59	361.17	100.00	299	2.27	130	510
Orthopristis chrysoptera	527	1.9	19.6	2.20	0.51	363.08	67.00	128	0.71	80	227
Eucinostomus gula	338	1.2	24.2	1.41	0.27	299.28	37.00	89	0.41	57	130
Menticirrhus americanus	303	1.1	14.2	1.26	0.98	1,197.47	234.00	149	1.59	89	254
Lactophrys quadricornis	270	1.0	29.2	1.13	0.22	308.26	33.00	149	1.68	57	219
Subtotal	25,097	91.1	.	.	.	.	.	.	.	41	510
Totals	**27,528**	**100.0**	**.**	**114.70**	**20.63**	**278.69**	**3,444.00**	**.**	**.**	**26**	**1200**

Table CH02-07. Catch statistics for Selected Taxa collected in 240 183-m purse seine samples during Charlotte Harbor stratified-random sampling, 2002. 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
Cynoscion arenarius	1,270	4.6	13.3	5.29	1.87	546.75	271.00	177	0.79	121	302
Elops saurus	604	2.2	28.3	2.52	0.59	361.17	100.00	299	2.27	130	510
Menticirrhus americanus	303	1.1	14.2	1.26	0.98	1,197.47	234.00	149	1.59	89	254
Cynoscion nebulosus	100	0.4	13.8	0.42	0.10	381.64	14.00	255	7.26	135	520
Lutjanus griseus	79	0.3	4.6	0.33	0.17	808.56	37.00	141	2.75	95	271
Lutjanus synagris	64	0.2	5.8	0.27	0.12	711.73	23.00	109	1.59	50	153
Callinectes sapidus	45	0.2	12.1	0.19	0.04	331.91	5.00	115	4.57	63	195
Scomberomorus maculatus	44	0.2	9.6	0.18	0.05	454.49	9.00	310	14.20	115	539
Mycteroperca microlepis	32	0.1	4.6	0.13	0.05	613.14	8.00	181	6.81	50	238
Leiostomus xanthurus	21	0.1	2.9	0.09	0.05	846.64	8.00	122	5.28	95	175
Pomatomus saltatrix	17	0.1	2.9	0.07	0.04	815.74	8.00	252	24.04	116	399
Paralichthys albigutta	10	0.0	3.8	0.04	0.01	528.36	2.00	222	22.28	119	318
Menippe spp.	8	0.0	2.9	0.03	0.01	605.41	2.00	41	4.62	26	61
Trachinotus carolinus	8	0.0	2.9	0.03	0.01	605.41	2.00	254	22.11	152	342
Farfantepenaeus duorarum	3	0.0	1.3	0.01	0.01	890.68	1.00	37	1.86	33	39
Epinephelus morio	3	0.0	0.4	0.01	0.01	1,549.19	3.00	137	3.00	131	140

Table CH02-07. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Trachinotus falcatus	3	0.0	0.8	0.01	0.01	1,152.77	2.00	213	49.67	163	312
Rachycentron canadum	2	0.0	0.4	0.01	0.01	1,549.19	2.00	775	5.00	770	780
Archosargus probatocephalus	1	0.0	0.4	0.00	0.00	1,549.19	1.00	100	.	100	100
Mugil gyrans	1	0.0	0.4	0.00	0.00	1,549.19	1.00	220	.	220	220
Totals	**2,618**	**9.5**	**64.2**	**10.91**	**2.64**	**374.46**	**485.00**	**.**	**.**	**26**	**780**

Table CH02-08. Catch statistics for 10 dominant taxa collected in 18 seasonal bay 6.1-m otter trawl samples during Charlotte Harbor stratified-random sampling, 2002. 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.	1,022	40.0	50.0	3.83	3.68	407.61	66.38	28	0.18	9	38
Lagodon rhomboides	335	13.1	22.2	1.26	0.78	263.33	10.39	97	0.43	82	131
Anchoa mitchilli	310	12.1	16.7	1.16	1.01	369.95	18.21	35	0.48	26	57
Eucinostomus gula	126	4.9	61.1	0.47	0.20	182.62	3.58	74	0.79	51	95
Menticirrhus americanus	106	4.2	44.4	0.40	0.18	191.14	2.63	30	2.77	11	182
Cynoscion arenarius	103	4.0	33.3	0.39	0.21	235.59	3.37	38	4.11	13	185
Chloroscombrus chrysurus	63	2.5	16.7	0.24	0.18	321.50	3.10	34	1.61	9	80
Farfantepenaeus duorarum	59	2.3	61.1	0.22	0.06	122.84	0.81	16	0.78	5	35
Prionotus scitulus	56	2.2	55.6	0.21	0.09	190.28	1.62	66	4.18	20	166
Bagre marinus	50	2.0	22.2	0.19	0.10	234.79	1.35	119	3.29	87	238
Subtotal	2,230	87.3	.	.	.	.	.	.	.	5	238
Totals	**2,552**	**100.0**	**.**	**9.56**	**4.72**	**209.36**	**87.02**	**.**	**.**	**5**	**370**

Table CH02-09. Catch statistics for Selected Taxa collected in 18 seasonal bay 6.1-m otter trawl samples during Charlotte Harbor stratified-random sampling, 2002. 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	106	4.2	44.4	0.40	0.18	191.14	2.63	30	2.77	11	182
Cynoscion arenarius	103	4.0	33.3	0.39	0.21	235.59	3.37	38	4.11	13	185
Farfantepenaeus duorarum	59	2.3	61.1	0.22	0.06	122.84	0.81	16	0.78	5	35
Lutjanus synagris	34	1.3	55.6	0.13	0.04	132.06	0.54	31	3.37	14	100
Callinectes sapidus	3	0.1	11.1	0.01	0.01	308.70	0.13	115	17.90	92	150
Menippe spp.	3	0.1	11.1	0.01	0.01	308.70	0.13	11	4.33	7	20
Epinephelus itajara	1	0.0	5.6	0.00	0.00	424.26	0.07	294	.	294	294
Cynoscion nebulosus	1	0.0	5.6	0.00	0.00	424.26	0.07	152	.	152	152
Leiostomus xanthurus	1	0.0	5.6	0.00	0.00	424.26	0.07	126	.	126	126
Paralichthys albigutta	1	0.0	5.6	0.00	0.00	424.26	0.07	286	.	286	286
Totals	**312**	**12.2**	**94.4**	**1.17**	**0.41**	**147.15**	**5.67**	**.**	**.**	**5**	**294**

Table CH02-10. Catch statistics for 10 dominant taxa collected in 96 21.3-m river seine samples during Charlotte Harbor stratified-random sampling, 2002. 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	16,679	53.1	43.8	255.50	161.65	619.91	15,411.76	30	0.05	17	66
Eucinostomus spp.	4,854	15.4	55.2	74.36	21.33	281.13	1,635.29	30	0.07	12	39
Menidia spp.	3,219	10.2	84.4	49.31	7.10	141.09	382.35	37	0.16	15	74
Mugil cephalus	1,068	3.4	22.9	16.36	12.22	731.95	1,152.94	30	0.41	16	182
Fundulus majalis	894	2.8	16.7	13.69	8.63	617.23	800.00	38	0.32	18	85
Eucinostomus harengulus	875	2.8	55.2	13.40	4.46	326.15	376.47	51	0.32	40	104
Gambusia holbrooki	678	2.2	11.5	10.39	5.76	543.61	469.12	23	0.15	15	42
Farfantepenaeus duorarum	628	2.0	32.3	9.62	4.12	419.45	326.47	8	0.12	3	20
Cynoscion arenarius	456	1.5	12.5	6.99	3.94	552.11	335.29	34	0.41	13	67
Microgobius gulosus	325	1.0	51.0	4.98	1.04	205.25	66.18	26	0.32	14	48
Subtotal	29,676	94.4	.	.	.	.	.	.	.	3	182
Totals	**31,433**	**100.0**	**.**	**481.51**	**172.93**	**351.89**	**16,301.47**	**.**	**.**	**3**	**555**

Table CH02-11. Catch statistics for Selected Taxa collected in 96 21.3-m river seine samples during Charlotte Harbor stratified-random sampling, 2002. 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	1,068	3.4	22.9	16.36	12.22	731.95	1,152.94	30	0.41	16	182
Farfantepenaeus duorarum	628	2.0	32.3	9.62	4.12	419.45	326.47	8	0.12	3	20
Cynoscion arenarius	456	1.5	12.5	6.99	3.94	552.11	335.29	34	0.41	13	67
Sciaenops ocellatus	295	0.9	28.1	4.52	1.58	342.81	120.59	33	1.67	8	317
Mugil gyrans	72	0.2	6.3	1.10	0.79	699.14	73.53	19	1.31	12	78
Callinectes sapidus	68	0.2	12.5	1.04	0.43	403.97	29.41	24	1.64	10	92
Menticirrhus americanus	39	0.1	5.2	0.60	0.39	644.45	35.29	41	1.56	28	70
Cynoscion nebulosus	27	0.1	10.4	0.41	0.17	398.62	11.76	44	4.12	22	110
Archosargus probatocephalus	6	0.0	5.2	0.09	0.04	453.29	2.94	153	20.89	78	204
Leiostomus xanthurus	6	0.0	2.1	0.09	0.07	727.22	5.88	93	10.09	67	139
Lutjanus griseus	3	0.0	3.1	0.05	0.03	559.70	1.47	173	12.34	149	190
Lutjanus synagris	2	0.0	2.1	0.03	0.02	689.16	1.47	79	31.00	48	110
Centropomus undecimalis	1	0.0	1.0	0.02	0.02	979.80	1.47	477	.	477	477
Totals	**2,671**	**8.5**	**66.7**	**40.92**	**14.67**	**351.30**	**1,204.41**	**.**	**.**	**3**	**477**

Table CH02-12. Catch statistics for 10 dominant taxa collected in 72 river 6.1-m otter trawl samples during Charlotte Harbor stratified-random sampling, 2002. 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	3,648	48.6	47.2	6.84	4.23	524.96	296.82	27	0.18	16	68
Trinectes maculatus	1,137	15.1	56.9	2.13	0.93	368.96	54.10	47	0.39	15	120
Cynoscion arenarius	734	9.8	51.4	1.38	0.36	221.36	16.19	35	0.65	10	188
Farfantepenaeus duorarum	663	8.8	55.6	1.24	0.48	325.88	31.84	12	0.28	4	42
Microgobius gulosus	319	4.2	33.3	0.60	0.40	567.60	28.47	18	0.38	11	51
Menticirrhus americanus	200	2.7	34.7	0.37	0.11	258.06	6.07	36	1.11	10	110
Eucinostomus spp.	179	2.4	16.7	0.34	0.21	540.20	14.98	28	0.31	10	35
Arius felis	147	2.0	12.5	0.28	0.16	482.46	8.63	82	4.92	44	315
Bairdiella chrysoura	143	1.9	23.6	0.27	0.15	473.27	9.71	69	1.99	21	198
Callinectes sapidus	87	1.2	43.1	0.16	0.04	185.28	1.48	95	4.75	10	193
Subtotal	7,257	96.7	.	.	.	.	.	.	.	4	315
Totals	**7,511**	**100.0**	**.**	**14.07**	**4.57**	**275.60**	**305.86**	**.**	**.**	**4**	**1040**

Table CH02-13. Catch statistics for Selected Taxa collected in 72 river 6.1-m otter trawl samples during Charlotte Harbor stratified-random sampling, 2002. 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	734	9.8	51.4	1.38	0.36	221.36	16.19	35	0.65	10	188
Farfantepenaeus duorarum	663	8.8	55.6	1.24	0.48	325.88	31.84	12	0.28	4	42
Menticirrhus americanus	200	2.7	34.7	0.37	0.11	258.06	6.07	36	1.11	10	110
Callinectes sapidus	87	1.2	43.1	0.16	0.04	185.28	1.48	95	4.75	10	193
Cynoscion nebulosus	5	0.1	5.6	0.01	0.00	440.79	0.27	88	29.74	28	174
Sciaenops ocellatus	4	0.1	2.8	0.01	0.01	595.76	0.27	19	2.86	14	27
Lutjanus griseus	2	0.0	1.4	0.00	0.00	848.53	0.27	170	16.00	154	186
Leiostomus xanthurus	2	0.0	1.4	0.00	0.00	848.53	0.27	69	3.50	65	72
Archosargus probatocephalus	1	0.0	1.4	0.00	0.00	848.53	0.13	140	.	140	140
Totals	**1,698**	**22.6**	**87.5**	**3.18**	**0.67**	**178.52**	**35.21**	**.**	**.**	**4**	**193**

Appendix CH02-01. Monthly summary of species collected during Charlotte Harbor stratified-random sampling, 2002. 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=75	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=84	E=84	E=75	E=918
Achirus lineatus	11	1	7	5	5	7	2	3	2	20	11	12	86
Adinia xenica	.	.	.	.	.	.	.	.	.	14	71	2	87
Aetobatis narinari	.	.	.	1	.	.	.	.	.	1	.	2	4
Aluterus schoepfi	.	.	.	.	.	.	1	2	.	.	.	3	6
Anarchopterus criniger	.	.	.	.	.	.	.	.	4	.	.	.	4
Anchoa hepsetus	.	.	.	.	.	71	.	1	.	76	.	.	148
Anchoa mitchilli	221	866	224	199	.	1,129	3	310	569	16,035	8,707	755	29,018
Archosargus probatocephalus	23	56	46	54	38	56	19	30	27	40	159	69	617
Arius felis	5	84	2	10	53	35	112	80	30	27	76	8	522
Bagre marinus	.	.	.	15	13	3	7	19	23	69	85	7	241
Bairdiella chrysoura	35	25	8	38	357	238	248	661	454	226	545	322	3,157
Bathygobius soporator	8	1	.	.	.	.	1	.	.	.	.	1	11
Blenniidae spp.	.	.	.	.	.	.	.	.	.	.	.	1	1
Brevoortia spp.	20	1	2	1	23	10	1	.	4	40	42	38	182
Calamus arctifrons	9	1	1	.	.	3	2	3	2	6	.	1	28
Callinectes sapidus	70	75	77	27	23	26	27	7	7	9	23	28	399
Caranx crysos	.	.	.	6	.	.	.	.	12	.	.	.	18
Caranx hippos	7	3	1	10	8	5	2	7	16	8	4	1	72
Carcharhinus brevipinna	.	.	.	1	.	.	.	.	.	.	.	.	1
Carcharhinus leucas	.	.	.	.	.	.	.	2	.	.	.	.	2
Centropomus undecimalis	41	24	106	75	72	72	159	13	185	53	39	45	884
Centropristis striata	.	.	.	.	.	.	.	.	.	.	1	2	3
Chaetodipterus faber	6	1	.	1	47	8	18	10	28	25	4	1	149
Chasmodes saburrae	4	1	.	.	2	14	13	3	3	15	15	1	71
Chilomycterus schoepfi	100	39	47	57	33	12	14	50	48	26	76	47	549

Appendix CH02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=84	E=84	E=75	E=918
Chloroscombrus chrysurus	.	.	.	79	90	21	13	25	8	73	1	1	311
Citharichthys macrops	.	1	.	.	.	.	.	1	.	13	.	.	15
Cynoscion arenarius	26	.	4	2	302	531	120	121	78	481	566	379	2,610
Cynoscion nebulosus	30	19	82	12	48	80	64	89	55	56	34	101	670
Cyprinodon variegatus	7	.	3	4	224	72	44	1	16	3	42	120	536
Dasyatis americana	.	.	.	1	.	4	1	3	.	1	.	.	10
Dasyatis sabina	14	5	4	4	24	12	7	4	19	18	8	8	127
Dasyatis say	.	2	1	1	1	4	.	2	2	1	2	1	17
Dasyatis spp.	.	.	.	.	.	.	.	.	.	1	.	.	1
Diapterus auratus	.	2	.	.	.	.	6	.	4	.	.	.	12
Diapterus plumieri	1	.	.	36	14	34	99	71	268	7	18	6	554
Diplectrum formosum	1	.	.	.	.	2	1	.	3	4	7	1	19
Diplodus holbrooki	.	1	.	.	.	.	.	.	.	.	.	.	1
Dorosoma petenense	19	.	.	.	.	.	.	.	.	.	.	13	32
Echeneis neucratoides	.	.	.	.	.	.	.	.	.	.	.	1	1
Elops saurus	9	4	121	112	19	31	30	92	67	88	78	141	792
Epinephelus itajara	.	.	.	.	.	.	1	.	3	.	1	.	5
Epinephelus morio	.	.	.	.	.	.	.	.	.	3	.	.	3
Etropus crossotus	1	.	.	.	.	.	.	.	.	3	18	3	25
Eucinostomus gula	42	114	113	303	186	432	613	957	847	1,050	333	372	5,362
Eucinostomus harengulus	14	90	52	100	57	116	348	303	681	338	645	165	2,909
Eucinostomus jonesi	.	.	.	.	.	.	.	.	.	.	1	.	1
Eucinostomus spp.	15	5	91	3	1,252	3,376	2,269	2,781	2,143	7,526	3,503	1,921	24,885
Farfantepenaeus duorarum	101	39	74	13	2	123	95	297	621	1,736	664	462	4,227
Floridichthys carpio	13	5	11	6	245	683	235	70	154	94	5	208	1,729
Fundulus confluentus	1	.	.	.	.	.	.	.	.	.	.	.	1

Appendix CH02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=84	E=84	E=75	E=918
Fundulus grandis	64	3	74	.	96	18	54	.	18	24	20	41	412
Fundulus majalis	3	120	148	6	551	27	126	73	2	1	.	8	1,065
Gambusia holbrooki	4	.	31	.	4	.	.	1	181	134	4	332	691
Ginglymostoma cirratum	.	.	.	.	.	.	1	.	.	.	.	.	1
Gobiesox strumosus	4	1	.	1	1	1	.	2	.	.	1	2	13
Gobionellus smaragdus	.	.	.	.	.	.	.	.	.	.	.	5	5
Gobiosoma bosc	14	1	1	2	.	5	.	2	8	3	12	15	63
Gobiosoma robustum	21	40	164	206	166	236	90	5	43	92	7	31	1,101
Gobiosoma spp.	6	6	12	.	60	253	67	44	101	113	37	39	738
Gymnura micrura	.	.	1	.	.	.	.	.	.	.	1	.	2
Haemulon plumieri	.	2	.	.	.	9	.	.	7	16	1	7	42
Harengula jaguana	2	141	.	16	173	23	354	111	247	369	171	272	1,879
Hemicaranx amblyrhynchus	.	.	.	.	.	.	.	.	1	1	.	.	2
Hippocampus erectus	1	2	3	5	1	.	.	.	.	.	1	4	17
Hippocampus zosterae	7	3	28	1	10	4	25	.	4	1	7	5	95
Hyporhamphus meeki	.	.	.	1	.	.	.	2	.	.	.	.	3
Hyporhamphus unifasciatus	.	.	.	.	.	.	.	.	1	.	.	.	1
Hypsoblennius hentzi	3	.	.	.	1	.	.	.	.	.	3	1	8
Lactophrys quadricornis	17	46	43	40	7	21	4	36	9	22	24	42	311
Lactophrys trigonus	1	.	1	.	.	.	.	.	.	.	.	.	2
Lagodon rhomboides	869	1,367	3,521	3,614	3,078	2,413	3,056	3,557	4,400	3,552	2,665	2,194	34,286
Leiostomus xanthurus	4	120	15	50	24	87	3	3	9	5	1	.	321
Lepisosteus osseus	.	.	.	.	.	1	.	13	221	8	.	.	243
Lepisosteus platyrhincus	.	.	.	.	.	.	.	.	1	.	2	.	3
Limulus polyphemus	1	.	13	24	20	4	11	2	9	1	2	.	87
Lophogobius cyprinoides	.	.	.	.	.	.	.	1	.	.	.	.	1

Appendix CH02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=84	E=84	E=75	E=918
Lucania parva	21	12	769	1,810	23,792	4,453	5,066	9,110	709	3,593	138	277	49,750
Lutjanus griseus	8	1	7	18	31	56	58	134	133	75	38	8	567
Lutjanus synagris	1	.	.	.	.	1	5	20	75	102	63	33	300
Membras martinica	.	.	.	.	4	162	.	.	.	.	6	1	173
Menidia spp.	885	1,661	832	546	2,050	1,252	817	4,435	542	554	424	409	14,407
Menippe spp.	.	.	2	2	.	1	1	.	2	1	2	4	15
Menticirrhus americanus	7	1	1	8	23	124	15	21	8	137	53	280	678
Menticirrhus saxatilis	3	.	.	1	.	.	.	.	.	1	.	1	6
Menticirrhus spp.	.	.	.	.	.	1	.	.	.	.	.	.	1
Microgobius gulosus	32	79	236	191	896	941	347	562	165	384	456	299	4,588
Microgobius thalassinus	.	.	.	.	.	2	.	2	.	.	6	.	10
Monacanthus ciliatus	.	.	.	.	.	.	.	.	.	.	1	.	1
Monacanthus hispidus	6	5	3	13	3	1	1	25	3	10	11	49	130
Mugil cephalus	876	36	238	24	28	14	22	4	23	16	16	19	1,316
Mugil curema	4	3	7	2	.	.	13	19	.	3	.	8	59
Mugil gyrans	30	13	9	.	1	.	.	4	7	81	47	11	203
Mugil spp.	1	.	.	.	.	.	.	.	.	.	.	.	1
Mycteroperca microlepis	.	.	.	3	16	26	35	58	90	70	28	8	334
Nicholsina usta	.	1	.	.	.	1	8	1	1	1	4	3	20
Ocyurus chrysurus	.	.	.	.	.	.	.	.	2	1	.	.	3
Ogcocephalus radiatus	.	4	.	1	.	.	.	.	.	.	.	1	6
Oligoplites saurus	1	1	1	15	17	51	25	39	24	1	.	.	175
Opisthonema oglinum	58	157	505	1,447	630	4,959	1,473	104	5,002	392	22	43	14,792
Opsanus beta	5	.	3	6	11	13	5	4	5	6	6	.	64
Orthopristis chrysoptera	4	5	5	358	95	46	108	177	186	177	152	89	1,402
Paralichthys albigutta	6	9	1	1	1	1	2	1	3	3	4	3	35

Appendix CH02-01. (Continued)

Species	Month												Totals
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=75	**E=75**	**E=75**	**E=75**	**E=75**	**E=75**	**E=75**	**E=75**	**E=75**	**E=84**	**E=84**	**E=75**	**E=918**
Peprilus alepidotus	.	.	.	.	.	.	.	.	.	.	.	29	29
Poecilia latipinna	16	.	16	.	72	4	.	96	3	88	9	1	305
Pogonias cromis	.	.	.	.	.	.	.	.	1	.	.	.	1
Pomatomus saltatrix	2	1	.	1	8	.	3	.	1	.	1	.	17
Prionotus scitulus	6	5	5	11	5	28	9	2	4	24	53	11	163
Prionotus tribulus	4	.	3	.	6	2	1	1	4	10	45	11	87
Rachycentron canadum	.	.	.	.	.	2	.	.	.	1	.	.	3
Rhinoptera bonasus	1	52	.	29	23	8	6	.	23	2	59	5	208
Rhizoprionodon terraenovae	.	.	.	2	.	.	.	.	.	.	.	.	2
Sardinella aurita	.	.	.	.	2	.	.	2	.	.	.	.	4
Sciaenops ocellatus	13	13	15	12	9	3	1	2	6	256	193	194	717
Scomberomorus maculatus	.	2	2	11	2	7	.	6	1	2	5	12	50
Scorpaena brasiliensis	.	.	.	.	.	.	.	.	.	1	.	.	1
Selene vomer	.	.	.	4	.	.	.	2	1	.	.	.	7
Serraniculus pumilio	.	.	.	.	.	.	.	.	.	.	1	.	1
Sparidae spp.	.	.	.	.	.	.	1	.	.	.	.	.	1
Sphoeroides nephelus	40	23	32	39	21	19	17	92	36	34	62	69	484
Sphoeroides spengleri	.	.	.	.	.	.	.	1	.	.	.	2	3
Sphyraena barracuda	2	.	.	.	.	1	.	.	2	.	2	2	9
Sphyrna tiburo	.	2	.	1	.	1	.	1	.	1	1	.	7
Strongylura marina	10	.	2	2	1	.	2	.	3	3	13	1	37
Strongylura notata	16	18	16	21	25	88	58	14	22	26	26	9	339
Strongylura spp.	.	.	.	5	35	.	.	.	.	.	3	.	43
Strongylura timucu	.	5	.	.	13	1	7	1	1	1	5	.	34
Symphurus plagiusa	7	4	1	.	3	1	3	3	10	37	41	68	178
Syngnathus floridae	.	1	.	.	2	2	4	7	3	9	23	10	61

Appendix CH02-01.   (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=75	E=84	E=84	E=75	E=918
Syngnathus louisianae	1	1	.	.	7	5	5	1	.	6	20	10	56
Syngnathus scovelli	87	26	49	56	132	171	333	77	23	16	88	54	1,112
Synodus foetens	17	16	17	19	15	12	10	22	19	21	111	72	351
Trachinotus carolinus	1	1	1	.	.	2	.	.	3	3	.	1	12
Trachinotus falcatus	62	.	2	.	.	71	.	4	14	6	6	1	166
Trinectes maculatus	26	13	10	16	29	30	390	129	589	50	15	5	1,302
Tylosurus crocodilus	.	.	.	.	.	.	1	.	6	.	.	.	7
Totals	**4,134**	**5,488**	**7,922**	**9,817**	**35,338**	**22,875**	**17,218**	**25,053**	**19,400**	**38,733**	**21,002**	**10,360**	**217,340**

Appendix CH02-02. Summary by gear, stratum, and zone of species collected during Charlotte Harbor stratified-random sampling, 2002. 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 183-m purse seine was post-stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 6.1-m otter trawl was not stratified. Zones A-D were located in Charlotte Harbor, and Zone F encompassed the lower Peace (P), and Myakka (M) Rivers. 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		183-m purse seine		6.1-m otter trawl						
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	Veg	Unveg		A	B	C	D	F	
	E=100	E=44	E=144	E=50	E=46	E=155	E=49	E=8	E=232	E=90	E=222	E=210	E=210	E=108	E=168	E=918
Achirus lineatus	13	2	22	4	15	.	1	.	22	7	14	24	17	9	22	86
Adinia xenica	.	.	71	12	4	.	.	.	.	.	.	.	71	.	16	87
Aetobatis narinari	.	.	.	.	.	2	.	.	2	.	.	.	1	3	.	4
Aluterus schoepfi	.	.	.	.	.	.	.	.	6	.	.	.	4	2	.	6
Anarchopterus criniger	.	.	4	.	.	.	.	.	.	.	.	.	4	.	.	4
Anchoa hepsetus	8	.	76	.	64	.	.	.	.	.	.	77	7	.	64	148
Anchoa mitchilli	618	635	7,128	12,419	4,260	.	.	.	.	3,958	6,559	1,064	1,068	.	20,327	29,018
Archosargus probatocephalus	30	.	36	3	3	427	116	.	1	1	48	293	102	167	7	617
Arius felis	2	3	.	.	.	120	32	1	217	147	96	144	66	69	147	522
Bagre marinus	.	.	.	.	.	15	.	1	136	89	121	7	21	53	39	241
Bairdiella chrysoura	395	12	748	75	35	824	280	4	634	150	303	1,273	923	405	253	3,157
Bathygobius soporator	.	.	.	1	9	.	.	.	.	1	.	.	.	.	11	11
Blenniidae spp.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	1
Brevoortia spp.	.	.	1	.	8	2	.	.	171	.	18	30	27	99	8	182
Calamus arctifrons	10	.	.	.	.	3	7	2	5	1	.	13	2	13	.	28
Callinectes sapidus	20	11	31	10	58	104	30	1	44	90	73	116	32	23	155	399
Caranx crysos	.	.	.	.	.	.	.	.	18	.	.	1	16	1	.	18
Caranx hippos	.	.	.	.	.	36	10	1	25	.	20	15	10	27	.	72
Carcharhinus brevipinna	.	.	.	.	.	.	.	.	1	.	.	.	.	1	.	1

Appendix CH02-02. (Continued)

Species	Gear and Strata										Zone					Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		183-m purse seine		6.1-m otter trawl						
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	Veg	Unveg		A	B	C	D	F	
	E=100	E=44	E=144	E=50	E=46	E=155	E=49	E=8	E=232	E=90	E=222	E=210	E=210	E=108	E=168	E=918
Carcharhinus leucas	.	.	.	.	.	1	1	.	.	.	2	.	.	.	.	2
Centropomus undecimalis	.	.	19	1	.	813	51	.	.	.	38	432	90	323	1	884
Centropristis striata	.	.	.	.	.	.	3	.	.	.	.	.	.	3	.	3
Chaetodipterus faber	.	2	1	.	.	100	15	3	13	15	19	50	49	30	1	149
Chasmodes saburrae	13	2	54	.	2	.	.	.	.	.	10	35	24	.	2	71
Chilomycterus schoepfi	27	4	5	.	.	154	111	8	213	27	20	267	104	154	4	549
Chloroscombrus chrysurus	.	.	1	.	.	.	1	.	244	65	148	82	65	14	2	311
Citharichthys macrops	.	.	1	.	.	.	.	.	1	13	1	2	12	.	.	15
Cynoscion arenarius	4	.	43	245	211	.	.	.	1,270	837	1,075	254	54	37	1,190	2,610
Cynoscion nebulosus	130	19	171	11	16	137	80	3	97	6	108	214	251	65	32	670
Cyprinodon variegatus	.	.	527	6	3	.	.	.	.	.	121	136	270	.	9	536
Dasyatis americana	.	.	.	.	.	4	3	.	3	.	.	2	2	6	.	10
Dasyatis sabina	3	.	2	1	1	36	19	.	33	32	65	8	14	10	30	127
Dasyatis say	.	.	.	.	.	6	1	.	10	.	6	3	5	3	.	17
Dasyatis spp.	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	1
Diapterus auratus	.	.	2	.	.	8	2	.	.	.	.	8	2	2	.	12
Diapterus plumieri	6	.	98	32	40	355	16	.	1	6	380	32	63	1	78	554
Diplectrum formosum	1	.	.	.	.	1	.	.	10	7	.	9	4	6	.	19
Diplodus holbrooki	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	1
Dorosoma petenense	.	.	.	.	.	.	.	.	32	.	32	.	.	.	.	32
Echeneis neucratoides	.	.	.	.	.	.	.	.	1	.	.	.	1	.	.	1
Elops saurus	.	.	3	.	.	88	97	15	589	.	82	207	169	334	.	792
Epinephelus itajara	.	.	.	.	.	4	.	.	.	1	1	4	.	.	.	5
Epinephelus morio	.	.	.	.	.	.	.	.	3	.	.	.	.	3	.	3
Etropus crossotus	.	.	.	.	.	.	.	.	5	20	3	13	9	.	.	25

Appendix CH02-02. (Continued)

Species	Gear and Strata										Zone					Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		183-m purse seine		6.1-m otter trawl						
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	Veg	Unveg		A	B	C	D	F	
	E=100	E=44	E=144	E=50	E=46	E=155	E=49	E=8	E=232	E=90	E=222	E=210	E=210	E=108	E=168	E=918
Eucinostomus gula	1,279	188	1,850	30	66	1,136	345	50	288	130	495	2,477	1,476	814	100	5,362
Eucinostomus harengulus	155	154	1,231	564	311	348	52	.	64	30	534	848	435	205	887	2,909
Eucinostomus jonesi	.	.	1	.	.	.	.	.	.	.	.	1	.	.	.	1
Eucinostomus spp.	5,514	763	12,553	2,831	2,023	.	.	.	.	1,201	4,181	10,678	4,993	.	5,033	24,885
Farfantepenaeus duorarum	1,358	153	1,351	144	484	10	2	.	3	722	830	1,369	733	4	1,291	4,227
Floridichthys carpio	288	54	1,387	.	.	.	.	.	.	.	38	984	707	.	.	1,729
Fundulus confluentus	.	.	1	.	.	.	.	.	.	.	1	.	.	.	.	1
Fundulus grandis	1	.	286	37	45	43	.	.	.	.	54	150	125	1	82	412
Fundulus majalis	.	2	165	80	814	3	1	.	.	.	16	87	67	1	894	1,065
Gambusia holbrooki	.	.	13	315	363	.	.	.	.	.	3	3	7	.	678	691
Ginglymostoma cirratum	.	.	.	.	.	.	.	1	.	.	.	.	.	1	.	1
Gobiesox strumosus	1	1	6	1	3	.	.	.	.	1	5	.	3	.	5	13
Gobionellus smaragdus	.	2	3	.	.	.	.	.	.	.	.	.	5	.	.	5
Gobiosoma bosc	2	3	13	11	34	.	.	.	.	.	17	1	.	.	45	63
Gobiosoma robustum	555	20	513	2	6	.	.	.	.	5	254	420	414	.	13	1,101
Gobiosoma spp.	297	24	343	11	40	.	.	.	.	23	161	131	372	.	74	738
Gymnura micrura	.	.	.	.	.	.	.	.	.	2	.	1	.	.	1	2
Haemulon plumieri	8	.	10	.	.	.	23	.	.	1	.	21	.	21	.	42
Harengula jaguana	441	.	236	.	2	174	245	135	644	2	302	1,230	163	182	2	1,879
Hemicaranx amblyrhynchus	.	.	.	.	.	.	.	.	1	1	2	.	.	.	.	2
Hippocampus erectus	3	1	1	.	.	.	.	.	11	1	3	3	7	4	.	17
Hippocampus zosterae	50	7	38	.	.	.	.	.	.	.	2	57	36	.	.	95
Hyporhamphus meeki	1	.	.	.	.	.	2	.	.	.	.	1	1	1	.	3
Hyporhamphus unifasciatus	.	.	.	.	.	.	1	.	.	.	.	.	.	1	.	1
Hypsoblennius hentzi	6	.	.	.	.	2	.	.	.	.	.	3	5	.	.	8

Appendix CH02-02. (Continued)

Species	Gear and Strata										Zone					Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		183-m purse seine		6.1-m otter trawl						
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	Veg	Unveg		A	B	C	D	F	
	E=100	E=44	E=144	E=50	E=46	E=155	E=49	E=8	E=232	E=90	E=222	E=210	E=210	E=108	E=168	E=918
Lactophrys quadricornis	3	.	.	.	.	3	20	25	245	15	4	101	59	147	.	311
Lactophrys trigonus	.	.	.	.	.	1	.	.	1	.	.	1	.	1	.	2
Lagodon rhomboides	6,310	68	5,725	25	74	12,558	3,431	253	5,480	362	963	16,705	6,063	10,429	126	34,286
Leiostomus xanthurus	12	6	135	2	4	130	8	.	21	3	14	230	15	54	8	321
Lepisosteus osseus	.	.	.	.	.	.	7	.	235	1	7	4	231	.	1	243
Lepisosteus platyrhincus	.	.	.	.	2	1	.	.	.	.	1	.	.	.	2	3
Limulus polyphemus	.	2	11	.	4	49	9	.	6	6	47	2	27	1	10	87
Lophogobius cyprinoides	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1
Lucania parva	32,550	111	17,051	26	12	.	.	.	.	.	540	14,982	34,190	.	38	49,750
Lutjanus griseus	83	.	64	2	1	224	112	22	57	2	9	259	83	211	5	567
Lutjanus synagris	72	1	27	2	.	34	66	2	62	34	14	125	69	90	2	300
Membras martinica	.	1	6	.	166	.	.	.	.	.	7	.	.	.	166	173
Menidia spp.	2,053	152	8,983	1,048	2,171	.	.	.	.	.	2,238	4,531	4,419	.	3,219	14,407
Menippe spp.	2	.	.	.	.	2	.	1	7	3	1	4	2	8	.	15
Menticirrhus americanus	5	3	21	24	15	1	.	.	303	306	142	250	38	9	239	678
Menticirrhus saxatilis	2	.	4	.	.	.	.	.	.	.	.	5	1	.	.	6
Menticirrhus spp.	.	.	.	.	.	.	.	.	.	1	.	.	.	.	1	1
Microgobius gulosus	1,491	284	2,168	185	140	.	.	.	.	320	2,207	294	1,443	.	644	4,588
Microgobius thalassinus	2	.	.	.	.	.	.	.	.	8	2	.	.	.	8	10
Monacanthus ciliatus	.	.	.	.	.	.	1	.	.	.	.	1	.	.	.	1
Monacanthus hispidus	49	.	27	.	.	17	16	5	14	2	5	86	25	14	.	130
Mugil cephalus	.	.	29	33	1,035	177	42	.	.	.	133	43	46	26	1,068	1,316
Mugil curema	.	.	14	.	.	34	11	.	.	.	11	40	6	2	.	59
Mugil gyrans	21	.	18	16	56	62	29	.	1	.	13	41	24	53	72	203
Mugil spp.	.	.	.	1	.	.	.	.	.	.	.	.	.	.	1	1

Appendix CH02-02. (Continued)

Species	Gear and Strata										Zone					Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		183-m purse seine		6.1-m otter trawl						
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	Veg	Unveg		A	B	C	D	F	
	E=100	E=44	E=144	E=50	E=46	E=155	E=49	E=8	E=232	E=90	E=222	E=210	E=210	E=108	E=168	E=918
Mycteroperca microlepis	13	.	3	.	.	156	130	8	24	.	1	198	27	108	.	334
Nicholsina usta	4	.	2	.	.	2	11	.	1	.	.	14	2	4	.	20
Ocyurus chrysurus	1	.	.	.	.	.	2	.	.	.	.	1	1	1	.	3
Ogcocephalus radiatus	.	.	.	.	.	3	.	.	3	.	.	4	1	1	.	6
Oligoplites saurus	13	10	71	10	16	16	19	1	19	.	65	16	59	9	26	175
Opisthonema oglinum	8	.	1	.	1	116	5	97	14,538	26	1,381	767	4,144	8,499	1	14,792
Opsanus beta	8	1	16	.	.	26	1	.	10	2	6	12	24	20	2	64
Orthopristis chrysoptera	423	3	50	.	.	131	252	23	504	16	42	748	325	287	.	1,402
Paralichthys albigutta	1	1	5	.	.	8	9	1	9	1	1	15	10	9	.	35
Peprilus alepidotus	.	.	.	.	.	.	.	.	29	.	.	29	.	.	.	29
Poecilia latipinna	13	.	177	21	93	1	.	.	.	.	1	3	187	.	114	305
Pogonias cromis	.	.	.	.	.	1	.	.	.	.	.	1	.	.	.	1
Pomatomus saltatrix	.	.	.	.	.	.	.	.	17	.	.	10	1	6	.	17
Prionotus scitulus	6	5	3	.	.	1	3	.	89	56	28	37	59	39	.	163
Prionotus tribulus	4	6	15	3	5	1	.	.	15	38	33	5	8	3	38	87
Rachycentron canadum	.	.	.	.	.	.	1	.	2	.	1	2	.	.	.	3
Rhinoptera bonasus	1	.	.	.	.	53	3	.	151	.	51	21	132	4	.	208
Rhizoprionodon terraenovae	.	.	.	.	.	.	.	.	2	.	.	.	.	2	.	2
Sardinella aurita	.	.	2	.	.	2	.	.	.	.	.	4	.	.	.	4
Sciaenops ocellatus	147	8	178	180	115	75	10	.	.	4	257	49	108	4	299	717
Scomberomorus maculatus	.	.	.	.	.	1	5	2	42	.	14	11	8	17	.	50
Scorpaena brasiliensis	.	.	.	.	.	.	.	.	.	1	.	1	.	.	.	1
Selene vomer	.	.	.	.	.	.	2	.	5	.	.	6	1	.	.	7
Serraniculus pumilio	1	.	.	.	.	.	.	.	.	.	.	.	1	.	.	1
Sparidae spp.	.	.	.	.	.	.	.	.	1	.	.	1	.	.	.	1

Appendix CH02-02. (Continued)

Species	Gear and Strata										Zone					Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		183-m purse seine		6.1-m otter trawl						
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	Veg	Unveg		A	B	C	D	F	
	E=100	E=44	E=144	E=50	E=46	E=155	E=49	E=8	E=232	E=90	E=222	E=210	E=210	E=108	E=168	E=918
Sphoeroides nephelus	78	31	57	.	2	203	89	4	11	9	62	202	147	71	2	484
Sphoeroides spengleri	1	.	1	.	.	.	1	.	.	.	1	1	.	1	.	3
Sphyraena barracuda	.	.	.	.	.	8	1	.	.	.	.	6	.	3	.	9
Sphyrna tiburo	.	.	.	.	.	2	1	.	4	.	1	2	1	3	.	7
Strongylura marina	.	.	.	.	.	9	28	.	.	.	3	18	14	2	.	37
Strongylura notata	11	5	148	28	13	96	38	.	.	.	86	91	99	22	41	339
Strongylura spp.	1	.	13	25	4	.	.	.	.	.	7	3	4	.	29	43
Strongylura timucu	.	.	20	2	.	6	6	.	.	.	.	26	6	.	2	34
Symphurus plagiusa	10	39	76	11	.	1	.	.	4	37	106	30	6	.	36	178
Syngnathus floridae	33	.	26	.	.	.	.	.	.	2	3	30	28	.	.	61
Syngnathus louisianae	18	3	18	.	.	.	.	.	1	16	8	23	20	1	4	56
Syngnathus scovelli	502	39	535	10	22	.	.	.	.	4	210	278	588	.	36	1,112
Synodus foetens	56	39	101	4	1	31	24	2	63	30	61	169	84	30	7	351
Trachinotus carolinus	.	.	3	.	.	1	.	.	8	.	1	7	1	3	.	12
Trachinotus falcatus	1	.	.	.	.	146	16	.	3	.	9	79	14	64	.	166
Trinectes maculatus	4	.	19	31	26	4	.	.	52	1,166	74	1	33	.	1,194	1,302
Tylosurus crocodilus	.	.	1	.	.	.	6	.	.	.	.	2	.	5	.	7
Totals	**55,253**	**2,880**	**64,870**	**18,535**	**12,898**	**19,350**	**5,963**	**671**	**26,857**	**10,063**	**25,133**	**63,909**	**65,993**	**23,361**	**38,944**	**217,340**

Indian River Lagoon

The Indian River Lagoon system (IRL) is a narrow estuarine lagoon extending from Ponce de Leon Inlet (29° 05'N) south to Jupiter Inlet (26° 50'N). The IRL system consists of three distinct basins (Mosquito Lagoon, Indian River Lagoon proper, and Banana River) that extend approximately 260 km along the east central coast of Florida. Freshwater inflow comes from creeks and rivers located mainly along the western shoreline, while five permanent inlets connect the lagoon to the ocean. In addition, one intermittently open connection via the Canaveral Locks connects the Banana River to the Atlantic Ocean just south of Cape Canaveral.

The Fisheries-Independent Monitoring (FIM) program has monitored populations of fish and selected invertebrates since in the northern Indian River Lagoon 1990. This section summarizes FIM program data collected in this region during 2002. Stratified-random sampling (SRS) was conducted monthly throughout 2002. The sampling area included six bay zones (A-E, and H) and one riverine zone (F) located in the northern portion of the Indian River Lagoon (Figure IR02-01). Zones A-C, and H were located in the Indian River, Zones D and E were located in the Banana River, and Zone F encompassed the St. Sebastian River. Zones C, D, and H were sampled with 21.3-m bay and 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. Zone E was also sampled monthly with the 183-m haul seine although this gear was not used in Zones A and B.

All methods are the same as those described in the Methods section of this report. During 2002, additional sets (2 183-m haul and 3 21.3-m bay seines) were made that were a result of inadvertently sampling the incorrect stratum, grid, or zone. In each case, the correct stratum, grid, or zone was subsequently sampled within the prescribed month.

Stratified-Random Sampling

Stratified-random sampling consisted of 455 21.3-m bay and river seines and 230 183-m haul seine samples and captured a total of 359,927 animals representing 131 taxa (Table IR02-01; Appendices IR02-01 and -02). Two taxa, *Anchoa mitchilli* and *Lucania* *parva,* dominated the collections with 60.6% of the total catch (Appendices IR02-01 and -02). Thirty-one Selected Taxa (n=34,165 animals) composed 9.5% of the total catch. Two new species were recorded: *Nicholsina usta*, the emerald parrotfish and *Paraclinus marmoratus,* the marbled blenny (Appendices IR02-01 and –02). Both fish were collected near Sebastian Inlet in Zone H.

Bay Sampling

21.3-m Bay Seines. A total of 221,899 animals were collected in 383 21.3-m bay seine samples and accounted for 48.4% of the annual SRS collections (Table IR02-01; Appendix IR02-02). The overall mean density estimate for this gear was 414 animals per 100 m^2 (Table IR02-02). The ten most abundant species accounted for 89.9% of the total seine collections. *Anchoa mitchilli* and *L. parva* were the most abundant species, accounting for 62.7% of the animals collected using the 21.3-m bay seines.

Collections included 25,859 animals (26 taxa) classified as Selected Taxa, which represented 11.6% of the total 21.3-m seine catch (Table IR02-03). *Leiostomus xanthurus, Micropogonias undulatus, and Farfantepenaeus duorarum* accounted for 88% of the Selected Taxa collected in this gear (Table IR02-03).

183-m Haul seines. A total of 31,793 animals were collected in 230 183-m haul seines and accounted for 8.8% of the total annual SRS collections (Tables IR02-01 and –04; Appendix IR02-02). The overall mean CPUE for this gear was 138.2 animals per set (Table IR02-04). *Lagodon rhomboides* was the most abundant species, accounting for 50.3% of the total 183-m haul seine catch.

The 183-m haul seine samples included 6,538 animals designated as Selected Taxa, accounting for 20.6% of the total 183-m haul seine catch (Table IR02-05). *Mugil curema* and *M. cephalus* were the most abundant Selected Taxa and accounted for 59.4% of the Selected Taxa collected in this gear (Table IR02-05).

River Sampling

21.3-m River Seines. A total of 106,235 animals were collected in 23.1-m river seine samples (n=72) and accounted for 29.5% of the annual SRS collections (Table

IR02-01; Appendix IR02-02). The overall mean density estimate for this gear was 2,169.8 animals per 100 m^2 (Table IR02-06). The ten most abundant species accounted for 98.7% of the total river seine collections. *Anchoa mitchilli, Brevoortia* spp., and *Eucinostomus* spp. accounted for 92.8% of the animals collected from seines.

The 21.3-m river seine collections included 1,410 animals (17 taxa) classified as Selected Taxa, representing 1.3% of the total river seine catch (Table IR02-07). *Micropogonias undulatus*, *Centropomus undecimalis*, and *L. xanthurus* accounted for 71.6% of the Selected Taxa collected in this gear (Table IR02-07).

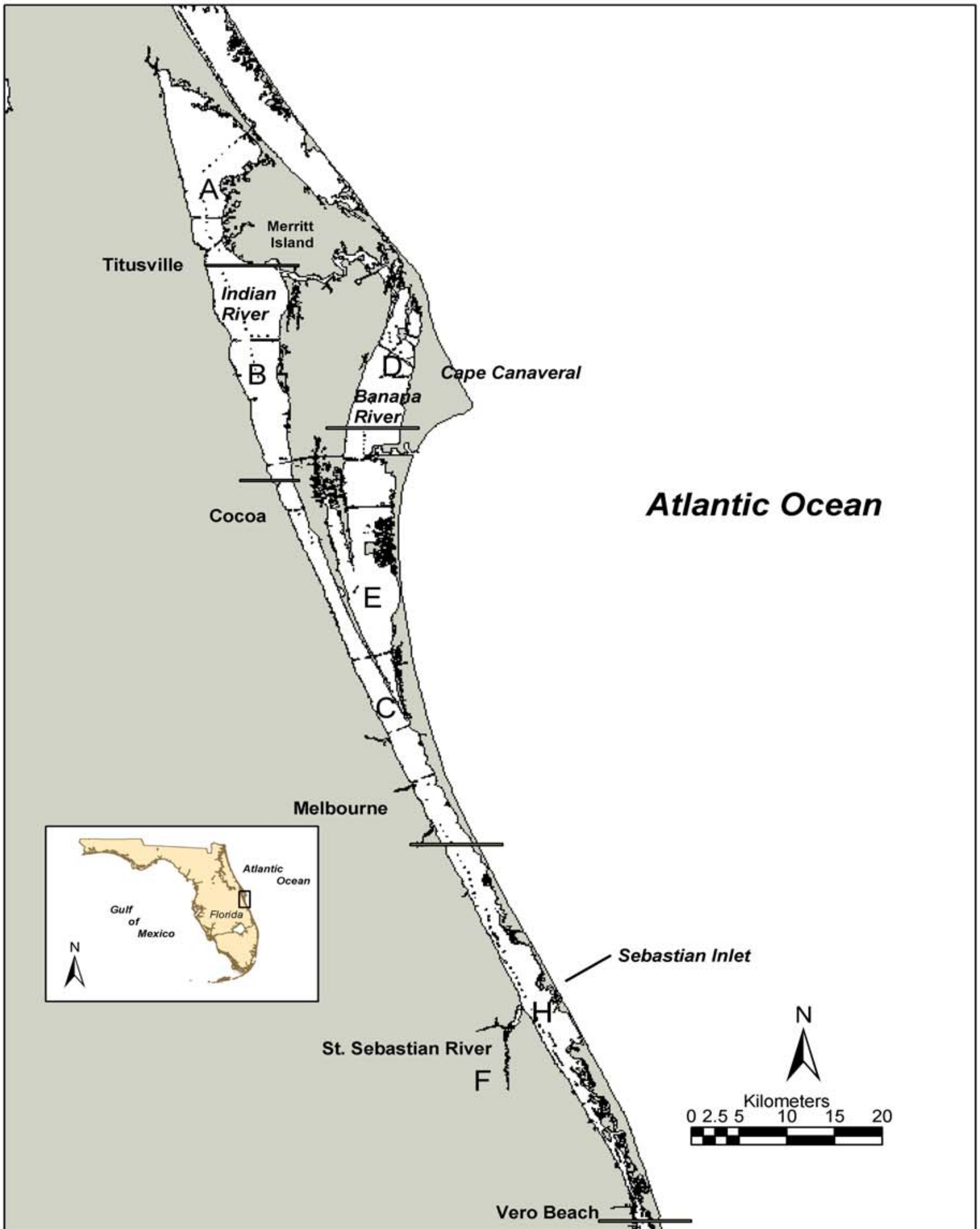

Figure IR02-01. Map of northern Indian River Lagoon sampling area. Zones are labeled A-F and H.

Table IR02-01. Summary of catch and effort data for Indian River stratified-random sampling, 2002.

Zone	21.3-m bay seine		21.3-m river seine		183-m haul seine		Totals	
	Animals	**Hauls**	**Animals**	**Hauls**	**Animals**	**Hauls**	**Animals**	**Hauls**
A	5,198	16	.	.	.	.	5,198	16
B	8,180	14	.	.	90	1	8,270	15
C	90,874	121	.	.	6,313	48	97,187	169
D	36,889	96	.	.	9,899	72	46,788	168
E	15,761	16	.	.	4,030	48	19,791	64
F	.	.	106,235	72	.	.	106,235	72
H	64,997	120	.	.	11,461	61	76,458	181
Totals	**221,899**	**383**	**106,235**	**72**	**31,793**	**230**	**359,927**	**685**

Table IR02-02. Catch statistics for 10 dominant taxa collected in 383 21.3-m bay seine samples during Indian River stratified-random sampling, 2002. 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	107,457	48.4	50.7	200.40	49.27	481.13	9,783.57	36	0.03	14	64
Lucania parva	31,843	14.4	43.1	59.39	13.45	443.39	3,920.00	22	0.03	8	45
Leiostomus xanthurus	15,590	7.0	10.4	29.07	25.92	1,744.90	9,920.00	36	0.05	15	88
Floridichthys carpio	11,366	5.1	34.7	21.20	8.18	754.77	2,788.57	27	0.08	8	75
Eucinostomus spp.	9,606	4.3	46.5	17.91	5.37	586.78	1,885.71	25	0.07	10	65
Menidia spp.	6,350	2.9	38.6	11.84	3.09	510.01	1,028.57	38	0.13	13	89
Micropogonias undulatus	5,164	2.3	6.5	9.63	5.04	1,024.59	1,402.14	24	0.08	5	65
Bairdiella chrysoura	4,535	2.0	30.8	8.46	2.12	489.78	535.00	37	0.26	7	140
Microgobius gulosus	4,036	1.8	43.3	7.53	1.42	368.41	317.86	26	0.11	12	61
Diapterus auratus	3,765	1.7	23.5	7.02	2.16	602.61	610.71	33	0.23	12	152
Subtotal	199,712	89.9	.	.	.	.	.	.	.	5	152
Totals	**221,899**	**100.0**	**.**	**413.84**	**59.88**	**283.15**	**11,430.71**	**.**	**.**	**3**	**620**

Table IR02-03. Catch statistics for Selected Taxa collected in 383 21.3-m bay seine samples during Indian River stratified-random sampling, 2002. 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	15,590	7.0	10.4	29.07	25.92	1,744.90	9,920.00	36	0.05	15	88
Micropogonias undulatus	5,164	2.3	6.5	9.63	5.04	1,024.59	1,402.14	24	0.08	5	65
Farfantepenaeus duorarum	2,012	0.9	22.7	3.75	1.34	700.60	474.29	11	0.09	3	26
Mugil cephalus	789	0.4	7.0	1.47	1.11	1,471.31	418.57	27	0.91	12	310
Cynoscion nebulosus	703	0.3	33.4	1.31	0.25	372.01	75.71	37	0.52	11	99
Sciaenops ocellatus	535	0.2	13.8	1.00	0.36	699.45	124.29	31	1.87	12	605
Mugil curema	290	0.1	13.8	0.54	0.21	763.97	56.43	72	2.41	18	172
Menticirrhus americanus	174	0.1	8.1	0.32	0.14	854.50	48.57	36	0.96	15	72
Farfantepenaeus aztecus	142	0.1	4.2	0.26	0.10	733.01	24.29	11	0.35	4	23
Archosargus probatocephalus	110	0.0	8.1	0.21	0.05	519.50	12.86	54	6.66	14	350
Lutjanus griseus	63	0.0	6.3	0.12	0.03	548.22	7.86	45	5.80	15	281
Trachinotus falcatus	51	0.0	1.8	0.10	0.08	1,549.48	28.57	43	1.73	16	69
Centropomus undecimalis	46	0.0	3.7	0.09	0.04	947.29	14.29	95	22.81	11	620
Lutjanus synagris	44	0.0	0.8	0.08	0.08	1,825.96	29.29	49	2.41	28	91
Litopenaeus setiferus	37	0.0	1.6	0.07	0.05	1,357.97	17.14	8	0.21	5	13
Penaeidae spp.	28	0.0	0.5	0.05	0.05	1,759.35	17.86	8	0.20	6	11

Table IR02-03. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Callinectes sapidus	26	0.0	4.2	0.05	0.01	584.95	3.57	43	8.91	6	167
Elops saurus	20	0.0	3.4	0.04	0.02	848.28	5.71	66	14.66	32	293
Paralichthys albigutta	13	0.0	1.6	0.02	0.02	1,248.12	5.71	56	11.05	35	143
Albula vulpes	10	0.0	1.3	0.02	0.01	1,032.08	2.86	34	4.28	23	69
Lutjanus analis	3	0.0	0.5	0.01	0.00	1,457.16	1.43	41	5.49	31	50
Cynoscion spp.	3	0.0	0.5	0.01	0.00	1,457.16	1.43	52	10.07	40	72
Mycteroperca microlepis	1	0.0	0.3	0.00	0.00	1,957.04	0.71	46	.	46	46
Pomatomus saltatrix	1	0.0	0.3	0.00	0.00	1,957.04	0.71	37	.	37	37
Lutjanus apodus	1	0.0	0.3	0.00	0.00	1,957.04	0.71	53	.	53	53
Cynoscion regalis	1	0.0	0.3	0.00	0.00	1,957.04	0.71	39	.	39	39
Pogonias cromis	1	0.0	0.3	0.00	0.00	1,957.04	0.71	430	.	430	430
Scomberomorus maculatus	1	0.0	0.3	0.00	0.00	1,957.04	0.71	37	.	37	37
Totals	**25,859**	**11.7**	**70.8**	**48.23**	**30.29**	**1,229.30**	**11,381.43**	**.**	**.**	**3**	**620**

TableIR02-04. Catch statistics for 10 dominant taxa collected in 230 183-m haul seine samples during Indian River stratified-random sampling, 2002. 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	15,996	50.3	82.2	69.55	11.28	245.88	2,005.00	138	0.17	57	270
Diapterus auratus	2,364	7.4	31.3	10.28	2.38	351.61	371.00	121	0.51	45	264
Mugil curema	2,232	7.0	74.3	9.70	1.76	274.91	236.00	155	0.76	80	370
Mugil cephalus	1,652	5.2	80.0	7.18	0.81	171.30	114.00	245	1.36	110	434
Eucinostomus harengulus	1,059	3.3	29.1	4.60	2.15	709.70	477.00	105	0.30	78	193
Arius felis	948	3.0	55.7	4.12	0.63	230.04	64.00	296	1.42	112	390
Dasyatis sabina	871	2.7	60.4	3.79	0.84	335.46	172.00	235	2.25	72	580
Sphoeroides nephelus	844	2.7	57.4	3.67	0.48	198.39	44.00	175	0.86	36	238
Archosargus probatocephalus	821	2.6	50.9	3.57	0.50	213.07	49.00	225	2.70	41	553
Eucinostomus gula	530	1.7	23.0	2.30	0.89	582.52	148.00	89	0.37	42	130
Subtotal	27,317	85.9	.	.	.	.	.	.	.	36	580
Totals	**31,793**	**100.0**	**.**	**138.23**	**13.01**	**142.75**	**2,251.00**	**.**	**.**	**20**	**1035**

Table IR02-05. Catch statistics for Selected Taxa collected in 230 183-m haul seine samples during Indian River stratified-random sampling, 2002. 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	2,232	7.0	74.3	9.70	1.76	274.91	236.00	155	0.76	80	370
Mugil cephalus	1,652	5.2	80.0	7.18	0.81	171.30	114.00	245	1.36	110	434
Archosargus probatocephalus	821	2.6	50.9	3.57	0.50	213.07	49.00	225	2.70	41	553
Leiostomus xanthurus	288	0.9	20.9	1.25	0.27	323.58	36.00	149	2.17	38	265
Centropomus undecimalis	261	0.8	25.2	1.13	0.24	317.93	38.00	436	10.20	149	915
Elops saurus	229	0.7	29.6	1.00	0.23	344.93	46.00	303	5.10	117	600
Sciaenops ocellatus	217	0.7	41.3	0.94	0.14	231.90	27.00	466	11.07	104	1035
Cynoscion nebulosus	173	0.5	23.9	0.75	0.25	514.00	52.00	221	6.77	57	592
Pogonias cromis	141	0.4	9.6	0.61	0.37	904.34	82.00	606	15.20	187	929
Lutjanus griseus	139	0.4	16.1	0.60	0.14	361.83	20.00	191	4.59	87	400
Micropogonias undulatus	125	0.4	8.3	0.54	0.29	803.33	53.00	159	2.94	56	298
Callinectes sapidus	119	0.4	20.0	0.52	0.10	292.21	10.00	102	3.72	27	306
Menticirrhus americanus	35	0.1	7.8	0.15	0.05	450.61	6.00	215	5.51	87	275
Cynoscion regalis	20	0.1	1.7	0.09	0.06	1,107.17	14.00	198	2.96	166	220
Trachinotus falcatus	18	0.1	4.3	0.08	0.03	563.85	5.00	162	22.12	51	327
Farfantepenaeus duorarum	15	0.0	3.5	0.07	0.03	687.39	5.00	32	2.73	20	48

Table IR02-05. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Paralichthys albigutta	13	0.0	3.5	0.06	0.02	575.92	3.00	178	15.26	94	296
Scomberomorus maculatus	9	0.0	2.2	0.04	0.02	903.89	5.00	318	30.68	145	491
Trachinotus carolinus	8	0.0	1.7	0.03	0.02	843.71	3.00	263	18.28	209	345
Mycteroperca microlepis	5	0.0	1.7	0.02	0.01	797.98	2.00	145	20.25	114	225
Albula vulpes	3	0.0	0.4	0.01	0.01	1,516.58	3.00	175	3.61	170	182
Lutjanus analis	3	0.0	1.3	0.01	0.01	871.76	1.00	136	12.12	120	160
Lutjanus synagris	3	0.0	0.9	0.01	0.01	1,128.41	2.00	100	7.37	89	114
Paralichthys lethostigma	3	0.0	1.3	0.01	0.01	871.76	1.00	474	3.38	467	478
Menippe spp.	2	0.0	0.9	0.01	0.01	1,070.04	1.00	73	27.00	46	100
Pomatomus saltatrix	2	0.0	0.9	0.01	0.01	1,070.04	1.00	220	146.00	74	366
Litopenaeus setiferus	1	0.0	0.4	0.00	0.00	1,516.58	1.00	25	.	25	25
Scomberomorus regalis	1	0.0	0.4	0.00	0.00	1,516.58	1.00	203	.	203	203
Totals	**6,538**	**20.6**	**97.4**	**28.43**	**2.24**	**119.43**	**253.00**	**.**	**.**	**20**	**1035**

Table IR02-06. Catch statistics for 10 dominant taxa collected in 72 21.3-m river seine samples during Indian River stratified-random sampling, 2002. 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	78,948	74.3	70.8	1,612.50	482.20	253.74	20,705.88	30	0.02	17	57
Brevoortia spp.	12,307	11.6	23.6	251.37	156.39	527.92	10,211.76	25	0.03	15	48
Eucinostomus spp.	7,366	6.9	91.7	150.45	33.45	188.67	1,694.12	24	0.09	9	39
Diapterus auratus	3,116	2.9	76.4	63.64	20.29	270.46	1,004.41	36	0.28	13	181
Eucinostomus harengulus	1,308	1.2	63.9	26.72	7.55	239.83	447.06	53	0.29	38	87
Micropogonias undulatus	516	0.5	13.9	10.54	8.00	643.73	564.71	33	0.40	15	72
Gambusia holbrooki	482	0.5	30.6	9.84	5.60	482.27	305.88	23	0.24	13	41
Menidia spp.	436	0.4	33.3	8.91	2.93	278.75	169.12	32	0.33	19	58
Centropomus undecimalis	261	0.2	51.4	5.33	1.56	248.66	85.29	56	4.32	16	677
Leiostomus xanthurus	232	0.2	11.1	4.74	2.90	519.34	197.06	26	0.89	14	91
Subtotal	104,972	98.7	.	.	.	.	.	.	.	9	677
Totals	**106,235**	**100.0**	**.**	**2,169.83**	**570.16**	**222.96**	**21,838.24**	**.**	**.**	**3**	**677**

Table IR02-07. Catch statistics for Selected Taxa collected in 72 21.3-m river seine samples during Indian River stratified-random sampling, 2002. 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**		**%**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**	**Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Micropogonias undulatus	516	0.5	13.9	10.54	8.00	643.73	564.71	33	0.40	15	72
Centropomus undecimalis	261	0.2	51.4	5.33	1.56	248.66	85.29	56	4.32	16	677
Leiostomus xanthurus	232	0.2	11.1	4.74	2.90	519.34	197.06	26	0.89	14	91
Callinectes sapidus	141	0.1	16.7	2.88	2.61	769.59	188.24	18	1.76	10	161
Farfantepenaeus duorarum	98	0.1	13.9	2.00	1.52	642.78	108.82	8	0.29	6	18
Mugil curema	69	0.1	26.4	1.41	0.65	390.61	39.71	104	4.59	17	270
Mugil cephalus	28	0.0	16.7	0.57	0.28	417.44	19.12	141	16.06	20	285
Archosargus probatocephalus	25	0.0	20.8	0.51	0.14	227.54	5.88	104	9.94	19	207
Sciaenops ocellatus	16	0.0	6.9	0.33	0.25	641.85	17.65	71	8.32	29	164
Lutjanus griseus	12	0.0	15.3	0.25	0.07	246.67	2.94	139	16.91	26	215
Farfantepenaeus aztecus	4	0.0	2.8	0.08	0.06	667.98	4.41	11	1.49	7	14
Elops saurus	2	0.0	2.8	0.04	0.03	595.76	1.47	73	19.50	53	92
Cynoscion nebulosus	2	0.0	1.4	0.04	0.04	848.53	2.94	16	1.50	14	17
Litopenaeus setiferus	1	0.0	1.4	0.02	0.02	848.53	1.47	18	.	18	18
Pomatomus saltatrix	1	0.0	1.4	0.02	0.02	848.53	1.47	27	.	27	27
Lutjanus apodus	1	0.0	1.4	0.02	0.02	848.53	1.47	73	.	73	73
Cynoscion spp.	1	0.0	1.4	0.02	0.02	848.53	1.47	28	.	28	28
Totals	**1,410**	**1.3**	**81.9**	**28.80**	**9.57**	**281.84**	**567.65**	**.**	**.**	**6**	**677**

Appendix IR02-01. Monthly summary of species collected during Indian River stratified-random sampling, 2002. 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=55	E=53	E=53	E=54	E=53	E=54	E=53	E=53	E=53	E=75	E=75	E=54	E=685
Achirus lineatus	8	2	12	2	3	5	3	5	3	10	6	1	60
Albula vulpes	.	4	.	.	3	1	2	.	.	.	3	.	13
Anchoa hepsetus	.	.	.	77	60	28	5	.	.	36	21	1	228
Anchoa mitchilli	18,692	21,727	13,576	32,482	11,742	19,370	5,383	1,294	30,102	21,748	8,045	2,244	186,405
Anchoa spp.	.	.	.	1	.	.	.	.	.	.	.	.	1
Anisotremus virginicus	.	.	.	.	.	.	.	.	.	.	1	.	1
Archosargus probatocephalus	130	19	26	81	204	93	84	87	89	72	24	47	956
Archosargus rhomboidalis	.	.	.	.	.	.	.	.	1	.	4	.	5
Arius felis	10	44	62	72	168	125	183	95	40	116	20	28	963
Bagre marinus	.	.	4	.	2	.	.	.	.	.	.	.	6
Bairdiella chrysoura	70	129	22	886	590	672	1,242	992	122	77	161	49	5,012
Bathygobius soporator	3	.	.	1	.	.	.	3	.	.	2	3	12
Brevoortia spp.	593	2,761	2,743	7,503	241	65	17	280	36	2	4	7	14,252
Callinectes sapidus	14	8	17	7	12	49	10	8	139	12	6	4	286
Caranx hippos	6	13	4	25	11	150	7	14	5	124	6	1	366
Caranx latus	1	.	.	1	1	.	.	.	.	1	2	.	6
Centropomus ensiferus	.	.	.	.	.	.	4	.	.	.	.	.	4
Centropomus parallelus	.	.	2	.	.	.	.	.	.	.	.	.	2
Centropomus spp.	.	.	3	.	.	.	.	.	20	.	.	.	23
Centropomus undecimalis	38	11	5	23	35	43	46	103	59	39	123	43	568
Chaetodipterus faber	1	1	.	34	3	5	17	16	6	9	1	.	93
Chasmodes saburrae	9	2	4	.	34	5	20	12	6	7	9	23	131
Chilomycterus schoepfi	31	8	5	33	13	17	9	16	3	6	5	5	151
Chloroscombrus chrysurus	.	.	.	9	.	.	.	.	1	.	.	.	10
Citharichthys spilopterus	.	.	1	6	5	1	10	2	.	11	.	.	36

Appendix IR02-01.   (Continued)

Species	Month												Totals
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	E=55	**E=53**	**E=53**	**E=54**	**E=53**	**E=54**	**E=53**	**E=53**	**E=53**	**E=75**	**E=75**	**E=54**	**E=685**
Cynoscion nebulosus	33	4	11	23	33	106	55	155	53	136	234	35	878
Cynoscion regalis	14	.	.	.	.	2	4	1	.	.	.	.	21
Cynoscion spp.	.	.	.	.	.	.	.	3	1	.	.	.	4
Cyprinodon variegatus	2	.	5	1	3	280	4	10	91	97	374	1	868
Dasyatis sabina	84	25	59	62	164	69	223	35	58	50	68	14	911
Dasyatis say	6	13	5	10	8	6	10	1	3	8	2	3	75
Diapterus auratus	266	71	106	493	128	321	541	676	743	1,221	3,401	1,278	9,245
Diapterus plumieri	2	2	1	1	4	4	33	7	4	4	11	4	77
Dormitator maculatus	.	.	.	.	.	.	1	.	.	.	.	.	1
Echeneis naucrates	.	.	.	.	.	.	.	.	.	1	.	.	1
Elops saurus	7	14	3	24	14	58	23	31	22	16	23	16	251
Eucinostomus gula	19	24	17	17	127	47	112	420	218	90	53	187	1,331
Eucinostomus harengulus	550	351	104	238	468	259	314	194	158	146	147	162	3,091
Eucinostomus jonesi	.	.	.	2	.	.	.	.	.	.	21	1	24
Eucinostomus spp.	1,564	1,858	869	402	425	916	288	426	554	1,543	6,356	1,774	16,975
Evorthodus lyricus	83	.	81	.	.	.	1	2	.	.	1	2	170
Farfantepenaeus aztecus	.	.	5	7	11	30	14	78	1	.	.	.	146
Farfantepenaeus duorarum	53	1,083	151	146	125	61	248	164	22	47	15	10	2,125
Farfantepenaeus spp.	.	.	1	13	.	8	.	4	29	73	184	40	352
Floridichthys carpio	49	202	33	241	229	3,091	550	761	456	938	4,641	180	11,371
Fundulus confluentus	.	.	.	.	.	.	.	.	.	.	1	.	1
Fundulus grandis	4	31	5	2	18	3	.	1	1	1	5	.	71
Gambusia holbrooki	215	181	43	3	1	1	21	3	.	1	21	10	500
Gerres cinereus	.	.	.	.	.	.	2	.	1	4	4	.	11
Gobiesox strumosus	3	1	.	.	.	.	.	.	.	.	.	.	4
Gobiomorus dormitor	.	.	1	.	.	.	1	.	.	.	1	2	5

Appendix IR02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=55	E=53	E=53	E=54	E=53	E=54	E=53	E=53	E=53	E=75	E=75	E=54	E=685
Gobionellus boleosoma	4	21	.	12	4	.	.	2	1	16	15	.	75
Gobionellus oceanicus	16	.	3	.	1	.	.	.	.	.	.	.	20
Gobionellus shufeldti	.	1	.	.	.	.	.	.	.	.	.	.	1
Gobiosoma bosc	4	80	6	2	24	9	12	2	.	4	2	3	148
Gobiosoma robustum	147	104	23	49	116	129	230	102	43	283	402	129	1,757
Gobiosoma spp.	.	.	.	.	.	.	.	.	.	.	1	.	1
Gymnura micrura	.	.	.	1	1	.	.	.	.	1	.	.	3
Haemulon parrai	.	.	.	.	.	.	6	49	1	5	7	3	71
Haemulon plumieri	.	.	1	.	.	1	.	.	.	1	.	.	3
Harengula jaguana	3	1	.	284	37	1,635	76	210	190	428	6	17	2,887
Hippocampus erectus	1	.	.	2	2	.	.	.	.	1	.	.	6
Hippocampus zosterae	3	.	.	.	.	4	5	.	1	9	2	1	25
Histrio histrio	.	.	.	1	.	.	.	.	.	.	.	.	1
Hoplosternum littorale	.	.	.	.	.	.	1	.	.	.	.	.	1
Hyporhamphus meeki	.	2	.	14	6	1	2	2	.	6	4	.	37
Labidesthes sicculus	.	3	1	.	4	.	4	4	5	63	.	6	90
Lactophrys quadricornis	.	.	.	.	.	.	1	.	.	.	.	.	1
Lactophrys trigonus	.	.	.	.	.	2	.	.	.	.	.	.	2
Lagodon rhomboides	723	651	649	2,334	1,474	2,020	4,062	2,091	1,599	1,729	692	686	18,710
Leiostomus xanthurus	10	15,061	462	256	91	88	40	10	50	15	27	.	16,110
Lepisosteus platyrhincus	.	.	.	.	.	1	.	2	.	2	.	1	6
Lepomis macrochirus	7	2	1	.	.	.	13	1	.	.	.	.	24
Lepomis microlophus	1	.	2	.	.	.	.	.	.	.	.	.	3
Limulus polyphemus	4	5	2	.	1	2	.	.	.	4	.	.	18
Litopenaeus setiferus	.	.	.	.	.	.	35	3	1	.	.	.	39
Lophogobius cyprinoides	1	.	.	.	.	.	.	.	.	.	.	.	1

Appendix IR02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=55	E=53	E=53	E=54	E=53	E=54	E=53	E=53	E=53	E=75	E=75	E=54	E=685
Lucania goodei	.	2	.	.	.	.	.	.	.	.	.	.	2
Lucania parva	388	475	652	784	1,491	3,579	747	8,627	1,318	4,638	8,121	1,078	31,898
Lutjanus analis	.	.	.	.	.	1	.	.	1	.	3	1	6
Lutjanus apodus	.	.	.	.	.	.	1	1	.	.	.	.	2
Lutjanus griseus	18	2	2	25	14	23	15	44	31	13	18	9	214
Lutjanus synagris	.	.	.	.	.	1	.	2	3	41	.	.	47
Membras martinica	.	.	5	92	1	1	5	.	.	53	8	3	168
Menidia spp.	133	270	37	446	427	829	1,821	1,141	185	612	665	221	6,787
Menippe spp.	.	1	.	.	.	.	.	.	1	.	.	.	2
Menticirrhus americanus	4	6	2	12	81	4	5	2	14	6	5	68	209
Microgobius gulosus	80	20	19	7	207	88	236	145	82	2,028	952	225	4,089
Microgobius thalassinus	.	.	.	.	1	.	.	1	.	2	.	.	4
Microphis brachyurus	.	.	.	.	.	.	.	.	.	1	.	.	1
Micropogonias undulatus	36	5,497	128	23	6	2	46	5	1	57	4	.	5,805
Micropterus salmoides	.	.	.	32	.	.	.	.	.	.	.	.	32
Monacanthus hispidus	.	.	2	43	.	10	1	.	2	1	1	3	63
Mugil cephalus	280	844	266	109	175	121	100	150	96	82	104	142	2,469
Mugil curema	184	212	674	186	304	206	82	88	104	125	101	325	2,591
Mugil spp.	.	46	1	.	.	.	.	.	.	.	.	.	47
Mycteroperca microlepis	.	.	.	.	.	3	.	.	2	.	1	.	6
Myrophis punctatus	1	.	.	.	.	.	.	.	.	.	.	.	1
Nicholsina usta	.	.	.	.	.	1	.	.	1	.	.	.	2
Notropis maculatus	.	.	.	.	.	.	10	.	.	.	.	.	10
Ocyurus chrysurus	.	.	.	.	.	.	1	.	.	1	.	.	2
Oligoplites saurus	2	.	1	10	23	37	65	52	44	43	42	9	328
Opisthonema oglinum	5	4	17	42	1	229	28	141	27	65	3	8	570

Appendix IR02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=55	E=53	E=53	E=54	E=53	E=54	E=53	E=53	E=53	E=75	E=75	E=54	E=685
Opsanus tau	.	.	.	1	2	1	1	.	1	.	.	.	6
Orthopristis chrysoptera	2	94	96	373	546	219	60	21	31	18	21	15	1,496
Paraclinus marmoratus	.	.	.	.	.	.	.	.	.	1	.	.	1
Paralichthys albigutta	.	8	1	2	5	3	2	.	2	3	.	.	26
Paralichthys lethostigma	.	.	.	1	1	.	.	1	.	.	.	.	3
Penaeidae spp.	.	.	.	.	.	.	.	.	28	.	.	.	28
Poecilia latipinna	3	4	4	150	18	677	20	7	3	416	83	.	1,385
Pogonias cromis	15	.	82	1	.	.	2	7	6	15	2	12	142
Pomatomus saltatrix	.	.	.	1	1	.	2	.	.	.	.	.	4
Prionotus scitulus	.	.	.	.	.	3	7	3	.	2	.	.	15
Prionotus tribulus	.	.	.	.	1	2	.	.	.	.	.	1	4
Sciaenops ocellatus	116	72	25	24	28	18	19	18	19	27	80	322	768
Scomberomorus maculatus	.	.	.	.	.	.	.	.	7	2	1	.	10
Scomberomorus regalis	.	.	.	.	.	.	.	.	.	1	.	.	1
Scorpaena plumieri	.	.	.	.	.	.	.	.	1	.	.	.	1
Selene vomer	.	3	3	13	14	14	9	1	11	8	2	.	78
Sparisoma radians	.	.	.	.	.	.	.	.	.	13	.	.	13
Sphoeroides nephelus	166	135	62	142	71	76	75	65	15	43	30	40	920
Sphoeroides spengleri	.	1	.	3	.	.	2	.	.	.	1	3	10
Sphoeroides testudineus	.	1	5	4	3	11	.	2	9	.	3	9	47
Sphyraena barracuda	.	.	.	.	4	.	1	3	3	3	4	4	22
Sphyraena borealis	.	.	.	.	.	4	.	.	.	.	.	.	4
Sphyraena guachancho	.	.	.	2	.	.	.	.	.	.	.	.	2
Strongylura marina	.	2	.	2	1	.	.	1	.	.	.	.	6
Strongylura notata	40	15	9	18	57	70	63	110	34	26	18	8	468
Strongylura spp.	.	.	.	.	.	.	.	.	1	.	.	.	1

Appendix IR02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=55	E=53	E=53	E=54	E=53	E=54	E=53	E=53	E=53	E=75	E=75	E=54	E=685
Strongylura timucu	.	.	2	.	13	18	.	2	1	1	1	.	38
Symphurus plagiusa	.	.	1	.	.	3	.	.	.	.	.	.	4
Syngnathus fuscus	.	.	.	1	.	.	.	.	.	.	.	.	1
Syngnathus louisianae	3	1	.	5	17	3	5	7	1	4	14	2	62
Syngnathus scovelli	112	40	32	44	54	98	98	45	15	54	105	52	749
Synodus foetens	.	2	.	.	2	3	2	.	3	.	2	.	14
Tilapia melanotheron	.	.	.	.	1	.	.	.	5	16	.	.	22
Tilapia spp.	.	.	.	.	.	.	.	.	1	.	.	.	1
Trachinotus carolinus	.	.	.	1	.	3	3	1	.	.	.	.	8
Trachinotus falcatus	4	.	.	1	.	.	5	5	10	2	40	2	69
Trinectes maculatus	.	1	.	.	.	.	3	.	.	.	.	.	4
Totals	**25,076**	**52,278**	**21,264**	**48,483**	**20,216**	**36,144**	**17,516**	**19,075**	**37,057**	**37,636**	**35,599**	**9,583**	**359,927**

Appendix IR02-02. Summary by gear, stratum, and zone of species collected during Indian River stratified-random sampling, 2002. Sampling with the 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 the 21.3-m river seine and the 183-m haul seine were post-stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Zones A-C and H were located in the Indian River; Zones D-E encompassed the Banana River; and Zone F encompassed the lower Sebastian 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									
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	A	B	C	D	E	F	H	
	E=113	E=53	E=217	E=50	E=22	E=144	E=86	E=16	E=15	E-169	E=168	E=64	E=72	E=181	E=685
Achirus lineatus	7	5	16	6	2	16	8	1	2	23	4	4	8	18	60
Albula vulpes	3	.	7	.	.	3	.	.	.	2	.	.	.	11	13
Anchoa hepsetus	115	.	110	.	3	.	.	.	.	27	1	.	3	197	228
Anchoa mitchilli	8,306	5,884	93,267	64,800	14,148	.	.	628	1,328	64,216	1,666	8,591	78,948	31,028	186,405
Anchoa spp.	.	.	1	.	.	.	.	.	.	1	.	.	.	.	1
Anisotremus virginicus	.	.	.	.	.	.	1	.	.	.	.	.	.	1	1
Archosargus probatocephalus	30	2	78	13	12	567	254	.	.	63	179	28	25	661	956
Archosargus rhomboidalis	.	.	.	.	.	.	5	.	.	.	.	.	.	5	5
Arius felis	4	3	7	1	.	645	303	.	1	300	169	137	1	355	963
Bagre marinus	.	.	.	.	.	6	.	.	.	4	.	.	.	2	6
Bairdiella chrysoura	2,290	229	2,016	.	.	370	107	3	138	1,651	538	105	.	2,577	5,012
Bathygobius soporator	.	.	9	2	1	.	.	.	.	.	.	.	3	9	12
Brevoortia spp.	895	9	799	9,933	2,374	87	155	.	.	603	860	15	12,307	467	14,252
Callinectes sapidus	4	2	20	138	3	84	35	.	.	34	3	1	141	107	286
Caranx hippos	.	.	5	1	3	223	134	.	.	17	23	134	4	188	366
Caranx latus	.	.	.	1	.	5	.	.	.	1	1	.	1	3	6
Centropomus ensiferus	.	.	.	.	4	.	.	.	.	.	.	.	4	.	4
Centropomus parallelus	.	.	.	2	.	.	.	.	.	.	.	.	2	.	2
Centropomus spp.	.	.	.	23	.	.	.	.	.	.	.	.	23	.	23
Centropomus undecimalis	.	1	45	177	84	213	48	.	.	23	31	7	261	246	568

Appendix IR02-02. (Continued)

Species	Gear and Strata							Zone							Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine									
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	A	B	C	D	E	F	H	
	E=113	E=53	E=217	E=50	E=22	E=144	E=86	E=16	E=15	685	E=168	E=64	E=72	E=181	E=685
Chaetodipterus faber	1	.	.	.	.	53	39	.	.	65	2	2	.	24	93
Chasmodes saburrae	47	1	82	1	.	.	.	2	2	43	41	1	1	41	131
Chilomycterus schoepfi	5	1	3	.	.	68	74	.	2	60	14	22	.	53	151
Chloroscombrus chrysurus	1	.	.	.	.	9	.	.	.	9	.	.	.	1	10
Citharichthys spilopterus	1	.	5	7	.	11	12	.	.	9	.	.	7	20	36
Cynoscion nebulosus	398	21	284	.	2	141	32	27	185	199	112	28	2	325	878
Cynoscion regalis	.	.	1	.	.	.	20	.	.	21	.	.	.	.	21
Cynoscion spp.	2	.	1	.	1	.	.	.	.	1	.	.	1	2	4
Cyprinodon variegatus	11	.	857	.	.	.	.	12	8	118	394	336	.	.	868
Dasyatis sabina	12	10	15	3	.	565	306	2	2	219	439	142	3	104	911
Dasyatis say	2	.	.	1	.	37	35	.	.	15	15	21	1	23	75
Diapterus auratus	221	578	2,966	1,509	1,607	1,474	890	2	105	1,433	250	80	3,116	4,259	9,245
Diapterus plumieri	.	1	.	28	33	10	5	.	.	7	.	3	61	6	77
Dormitator maculatus	.	.	1	.	.	.	.	.	.	.	.	.	.	1	1
Echeneis naucrates	.	.	.	.	.	1	.	.	.	.	1	.	.	.	1
Elops saurus	8	4	8	2	.	191	38	1	.	47	85	48	2	68	251
Eucinostomus gula	206	5	585	5	.	439	91	.	1	98	20	172	5	1,035	1,331
Eucinostomus harengulus	58	24	642	453	855	862	197	7	5	419	661	189	1,308	502	3,091
Eucinostomus jonesi	17	.	7	.	.	.	.	.	.	.	.	.	.	24	24
Eucinostomus spp.	3,920	374	5,312	4,153	3,213	.	3	57	61	574	28	340	7,366	8,549	16,975
Evorthodus lyricus	.	.	3	166	1	.	.	.	.	.	.	.	167	3	170
Farfantepenaeus aztecus	2	.	140	4	.	.	.	.	.	8	.	.	4	134	146
Farfantepenaeus duorarum	209	8	1,795	93	5	10	5	.	1	66	7	1	98	1,952	2,125
Farfantepenaeus spp.	48	.	282	20	2	.	.	2	1	.	.	.	22	327	352
Floridichthys carpio	1,440	307	9,619	.	.	5	.	353	390	1,802	4,791	3,986	.	49	11,371

Appendix IR02-02. (Continued)

Species	Gear and Strata							Zone							Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine									
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	A	B	C	D	E	F	H	
	E=113	E=53	E=217	E=50	E=22	E=144	E=86	E=16	E=15	685	E=168	E=64	E=72	E=181	E=685
Fundulus confluentus	.	.	1	.	.	.	.	.	.	.	.	1	.	.	1
Fundulus grandis	.	.	20	.	.	39	12	3	1	2	62	.	.	3	71
Gambusia holbrooki	1	.	17	285	197	.	.	.	.	.	18	.	482	.	500
Gerres cinereus	.	.	4	.	2	1	4	.	.	.	.	.	2	9	11
Gobiesox strumosus	2	1	1	.	.	.	.	.	.	3	1	.	.	.	4
Gobiomorus dormitor	.	.	1	4	.	.	.	.	.	.	.	.	4	1	5
Gobionellus boleosoma	23	1	49	1	1	.	.	.	.	.	.	.	2	73	75
Gobionellus oceanicus	.	.	1	16	.	3	.	.	.	.	.	.	16	4	20
Gobionellus shufeldti	.	.	.	.	1	.	.	.	.	.	.	.	1	.	1
Gobiosoma bosc	12	1	13	97	25	.	.	.	.	10	.	.	122	16	148
Gobiosoma robustum	630	112	971	36	8	.	.	39	158	271	349	229	44	667	1,757
Gobiosoma spp.	.	.	.	.	1	.	.	.	.	.	.	.	1	.	1
Gymnura micrura	.	.	1	.	.	2	.	.	.	.	.	.	.	3	3
Haemulon parrai	5	.	63	.	.	1	2	.	.	.	.	.	.	71	71
Haemulon plumieri	1	.	2	.	.	.	.	.	.	.	.	.	.	3	3
Harengula jaguana	2,093	.	547	.	.	67	180	.	.	457	38	2	.	2,390	2,887
Hippocampus erectus	3	2	1	.	.	.	.	.	1	1	4	.	.	.	6
Hippocampus zosterae	19	1	5	.	.	.	.	9	.	.	12	1	.	3	25
Histrio histrio	.	.	1	.	.	.	.	.	.	.	.	.	.	1	1
Hoplosternum littorale	.	.	.	1	.	.	.	.	.	.	.	.	1	.	1
Hyporhamphus meeki	16	19	1	.	.	1	.	.	.	15	17	.	.	5	37
Labidesthes sicculus	.	.	.	85	5	.	.	.	.	.	.	.	90	.	90
Lactophrys quadricornis	.	.	.	.	.	1	.	.	.	1	.	.	.	.	1
Lactophrys trigonus	.	.	.	.	.	1	1	.	.	1	.	.	.	1	2
Lagodon rhomboides	1,293	11	1,391	5	14	11,323	4,673	2	16	1,943	6,278	2,082	19	8,370	18,710

Appendix IR02-02. (Continued)

Species	Gear and Strata							Zone							Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine									
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	A	B	C	D	E	F	H	
	E=113	E=53	E=217	E=50	E=22	E=144	E=86	E=16	E=15	685	E=168	E=64	E=72	E=181	E=685
Leiostomus xanthurus	28	4	15,558	150	82	203	85	.	.	14,154	46	15	232	1,663	16,110
Lepisosteus platyrhincus	.	.	.	5	.	.	1	.	.	.	1	.	5	.	6
Lepomis macrochirus	.	.	.	18	6	.	.	.	.	.	.	.	24	.	24
Lepomis microlophus	.	.	.	3	.	.	.	.	.	.	.	.	3	.	3
Limulus polyphemus	.	.	1	.	.	11	6	.	1	3	5	9	.	.	18
Litopenaeus setiferus	2	.	35	1	.	1	.	.	.	12	.	1	1	25	39
Lophogobius cyprinoides	.	.	1	.	.	.	.	.	.	.	.	.	.	1	1
Lucania goodei	.	.	.	.	2	.	.	.	.	.	.	.	2	.	2
Lucania parva	13,989	354	17,500	41	14	.	.	2,494	5,367	1,068	21,250	755	55	909	31,898
Lutjanus analis	3	.	.	.	.	1	2	.	.	.	.	.	.	6	6
Lutjanus apodus	.	.	1	.	1	.	.	.	.	.	.	.	1	1	2
Lutjanus griseus	22	.	41	8	4	103	36	.	.	21	15	.	12	166	214
Lutjanus synagris	1	.	43	.	.	1	2	.	.	.	.	.	.	47	47
Membras martinica	96	3	69	.	.	.	.	21	.	104	3	40	.	.	168
Menidia spp.	2,309	105	3,936	231	205	.	1	726	149	1,252	3,799	97	436	328	6,787
Menippe spp.	.	.	.	.	.	1	1	.	.	.	.	2	.	.	2
Menticirrhus americanus	23	24	127	.	.	20	15	.	3	171	.	9	.	26	209
Microgobius gulosus	1,730	170	2,136	53	.	.	.	760	284	525	993	1,129	53	345	4,089
Microgobius thalassinus	1	2	1	.	.	.	.	.	.	1	.	.	.	3	4
Microphis brachyurus	.	.	.	1	.	.	.	.	.	.	.	.	1	.	1
Micropogonias undulatus	67	3	5,094	125	391	55	70	.	.	1,541	.	.	516	3,748	5,805
Micropterus salmoides	.	.	.	32	.	.	.	.	.	.	.	.	32	.	32
Monacanthus hispidus	17	1	42	.	1	1	1	.	.	1	.	.	1	61	63
Mugil cephalus	1	5	783	10	18	818	834	.	5	1,109	613	157	28	557	2,469
Mugil curema	2	8	280	12	57	982	1,250	3	4	1,184	325	445	69	561	2,591

Appendix IR02-02.   (Continued)

Species	Gear and Strata							Zone							Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine									
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	A	B	C	D	E	F	H	
	E=113	E=53	E=217	E=50	E=22	E=144	E=86	E=16	E=15	685	E=168	E=64	E=72	E=181	E=685
Mugil spp.	.	.	46	1	.	.	.	.	.	46	.	.	1	.	47
Mycteroperca microlepis	1	.	.	.	.	2	3	.	.	.	.	.	.	6	6
Myrophis punctatus	1	.	.	.	.	.	.	.	.	.	.	.	.	1	1
Nicholsina usta	1	.	.	.	.	.	1	.	.	.	.	.	.	2	2
Notropis maculatus	.	.	.	10	.	.	.	.	.	.	.	.	10	.	10
Ocyurus chrysurus	.	.	2	.	.	.	.	.	.	.	.	.	.	2	2
Oligoplites saurus	32	11	177	15	14	42	37	7	4	135	39	20	29	94	328
Opisthonema oglinum	124	.	192	.	.	72	182	.	.	226	2	42	.	300	570
Opsanus tau	1	.	.	.	.	3	2	.	.	1	2	1	.	2	6
Orthopristis chrysoptera	601	41	569	.	.	247	38	.	.	77	23	2	.	1,394	1,496
Paraclinus marmoratus	.	1	.	.	.	.	.	.	.	.	.	.	.	1	1
Paralichthys albigutta	3	.	10	.	.	12	1	.	.	.	.	.	.	26	26
Paralichthys lethostigma	.	.	.	.	.	2	1	.	.	1	2	.	.	.	3
Penaeidae spp.	.	.	28	.	.	.	.	.	.	.	.	.	.	28	28
Poecilia latipinna	8	1	1,370	3	3	.	.	.	.	12	1,363	3	6	1	1,385
Pogonias cromis	.	.	1	.	.	131	10	.	.	.	115	2	.	25	142
Pomatomus saltatrix	.	.	1	.	1	1	1	.	.	1	.	.	1	2	4
Prionotus scitulus	.	1	.	.	.	.	14	.	.	15	.	.	.	.	15
Prionotus tribulus	.	.	1	.	.	2	1	.	.	1	.	.	.	3	4
Sciaenops ocellatus	35	26	474	4	12	132	85	1	9	132	111	43	16	456	768
Scomberomorus maculatus	.	.	1	.	.	3	6	.	.	1	.	.	.	9	10
Scomberomorus regalis	.	.	.	.	.	1	.	.	.	.	.	.	.	1	1
Scorpaena plumieri	.	.	.	.	.	.	1	.	.	.	.	.	.	1	1
Selene vomer	1	.	.	.	1	67	9	.	.	2	1	.	1	74	78
Sparisoma radians	.	.	13	.	.	.	.	.	.	.	.	.	.	13	13

Appendix IR02-02. (Continued)

Species	Gear and Strata							Zone							Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine									
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	A	B	C	D	E	F	H	
	E=113	E=53	E=217	E=50	E=22	E=144	E=86	E=16	E=15	685	E=168	E=64	E=72	E=181	E=685
Sphoeroides nephelus	28	10	38	.	.	438	406	1	1	172	449	237	.	60	920
Sphoeroides spengleri	1	.	4	.	.	4	1	.	.	.	.	.	.	10	10
Sphoeroides testudineus	5	.	13	.	.	14	15	.	.	.	.	.	.	47	47
Sphyraena barracuda	1	.	7	.	.	9	5	.	.	.	1	.	.	21	22
Sphyraena borealis	4	.	.	.	.	.	.	.	.	.	.	.	.	4	4
Sphyraena guachancho	.	.	2	.	.	.	.	.	.	.	.	.	.	2	2
Strongylura marina	.	.	1	1	1	2	1	.	.	1	1	.	2	2	6
Strongylura notata	29	17	370	4	4	38	6	3	6	204	168	13	8	66	468
Strongylura spp.	.	.	.	.	.	1	.	.	.	.	.	.	.	1	1
Strongylura timucu	5	1	26	3	3	.	.	.	.	1	26	1	6	4	38
Symphurus plagiusa	.	.	.	.	.	4	.	.	.	.	.	.	.	4	4
Syngnathus fuscus	.	.	1	.	.	.	.	.	.	.	.	.	.	1	1
Syngnathus louisianae	25	4	33	.	.	.	.	4	.	18	9	1	.	30	62
Syngnathus scovelli	323	45	380	1	.	.	.	28	29	102	282	57	1	250	749
Synodus foetens	2	.	3	.	1	4	4	.	.	.	.	.	1	13	14
Tilapia melanotheron	.	.	21	.	.	1	.	.	.	1	21	.	.	.	22
Tilapia spp.	.	.	1	.	.	.	.	.	.	.	1	.	.	.	1
Trachinotus carolinus	.	.	.	.	.	5	3	.	.	4	3	1	.	.	8
Trachinotus falcatus	1	1	49	.	.	10	8	.	.	5	5	1	.	58	69
Trinectes maculatus	.	.	.	3	.	.	1	.	.	1	.	.	3	.	4
Totals	**41,884**	**8,455**	**171,560**	**82,807**	**23,428**	**20,978**	**10,815**	**5,198**	**8,270**	**97,187**	**46,788**	**19,791**	**106,235**	**76,458**	**359,927**

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Cedar Key

Cedar Key is located along the Gulf coast of Florida within the area known as the Big Bend. Unusual characteristics of the area include its relatively undeveloped shorelines and the absence of an enclosed estuary. The Suwannee River empties directly into the Gulf of Mexico forming an open estuary that extends 12.9 km north of the river mouth, southeastward to the islands comprising the Cedar Keys, and extends approximately 8.0 km offshore (Suwannee River Water Management District, unpublished data). The area is characterized by large expanses of saltmarsh, tidal creeks, oyster bars, mud flats, and seagrasses (predominately surrounding the keys). Details of the sampling area (Figure CK02-01) are given in the 1996 FIM Program Annual Data Summary.

The Fisheries-Independent Monitoring (FIM) program has conducted intensive fisheries sampling in the Cedar Key area since 1996. The sampling area (731 km^2) was divided into three zones (Figure CK02-01). Zone B encompassed the northern portion of the sampling universe and included the mouth of the Suwannee River and all tidal creeks. Zone C encompassed the southern portion of the sampling universe and included the area containing the Cedar Keys. Zone F contained the lower Suwannee River from the mouth upstream to the vicinity of Monden Creek. Several grids are contained in both Zone B and F. The gear selected determines zone selection. Without a shoreline surrounding an enclosed bay, the seaward demarcation for sampling is the 3-nm line on NOAA Chart 11408. Monthly stratified-random sampling (SRS) was conducted year-round using 21.3-m river seines, 21.3-m bay seines, 183-m haul seines, and 6.1-m otter trawls. The 21.3-m river seine was used in tidal creeks (Zone B) and the lower Suwannee River (Zone F) where other gears and deployment methods could not be used effectively. This section summarizes FIM data collected in Cedar Key area during 2002. All methods were identical to those described in the Methods section of this report.

Stratified-Random Sampling

A total of 134,119 fishes (141 taxa) and selected invertebrates (4 taxa) were collected in 2002 (Table CK02-01, Appendices CK02-01 and -02). The highest monthly catch occurred in September (n=20,089; Appendix CK02-01). The lowest catch occurred in December (n=3,442). Collections in 2002 included five species new to the Cedar Key FIM collection. These species were: *Lobotes surinamensis* (tripletail), *Micropterus notius* (Suwannee bass, *Ophidion holbrooki* (bank cusk-eel), *Raja texana* (Roundel skate), and *Sparisoma radians* (bucktooth parrotfish).

Bay Sampling

21.3-m Bay Seines: A total of 31,401 animals were collected in 252 bay seine samples (Table CK02-01 and -02). The mean density estimate for this gear was 89 animals/100 m^2. *Anchoa mitchilli* was the most abundant species collected (n=10,686) followed by *Membras martinica* (n=3,019). *Anchoa mitchilli* accounted for 34.0% of the total 21.3-m bay seine catch. *Lagodon rhomboides* (n=2,365), *Anchoa hepsetus* (n=2,343), and *Bairdiella chrysoura* (n=2,309) were the next three most abundant species collected.

A total of 2,658 animals representing 21 Selected Taxa were collected (Table CK02-03), accounting for 8.5% of the total 21.3-m bay seine catch. *Leiostomus xanthurus* (n=1,615) was the most abundant of the Selected Taxa and comprised 60.8% of the total Selected Taxa captured. *Cynoscion arenarius* (n=262), *Farfantepenaeus duorarum* (n=198), and *Callinectes sapidus* (n=148) were the next three most abundant Selected Taxa. Mean densities were less than one animal/100 m^2 for 20 of the 21 Selected Taxa collected.

183-m Haul Seines: A total of 31,095 animals were collected in 192 hauls with the 183-m haul seine (Table CK02-01 and -04). The mean catch-per-unit-effort for this gear was 162 animals per set. *Lagodon rhomboides* (n=8,615) was the most dominant species collected, followed by *B. chrysoura* (n=8,601). Together these two species accounted for 55.4% of the total catch with this gear.

A total of 25 Selected Taxa were collected in the 183-m haul seine samples (Table CK02-05). Selected Taxa comprised 19.3% of the total 183-m haul seine catch and *L. xanthurus* and *M. cephalus* accounted for 70.2% of the Selected Taxa individuals collected.

6.1-m Bay Otter Trawl: A total of 11,919 animals were collected in 120 tows with the 6.1-m bay otter trawl (Table CK02-06). The mean density estimate for this gear was 7 animals/100-m^2. *Anchoa mitchilli* (n=3,721) was the dominant species caught, followed by *L. rhomboides* (n=1,469) and *B. chrysoura* (n=1,253).

A total of 13 Selected Taxa were collected in 6.1-m bay otter trawl samples (CK02-07). *Cynoscion arenarius* (n=986) was the most abundant taxa accounting for 52.1% of the Selected Taxa individuals caught. *Leiostomus xanthurus* (n=260), *Menippe* spp. (n=168), and *Menticirrhus americanus* (n=152) were the next three most abundant Selected Taxa caught.

River Sampling

21.3-m River Seines: A total of 39,947 animals were collected in 108 21.3-m river seine samples taken in Zone B tidal creeks (Table CK02-01 and -08). The mean density estimate for this gear was 544 animals/100 m^2. *Anchoa mitchilli* (n=26,647) dominated the catch, comprising 66.7% of the total catch and occurring in 57.4% of the 21.3-m river seine samples taken. *Leiostomus xanthurus* (n=2,648), *Menidia* spp. (n=2,213), and *Eucinostomus* spp. (n=1,617) were the next three most abundant taxa.

Seventeen Selected Taxa were collected in river seines with *L. xanthurus* (n=2,648) accounting for 71.1% of the Selected Taxa individuals captured (Table CK02-09). *Callinectes sapidus* (n=286), *Mugil cephalus* (n=198), and *F. duorarum* (n=197) were the next three most abundant Selected Taxa.

Lower Suwannee River: Sampling (Zone F) consisted of 60 6.1-m river otter trawls and 60 21.3-m river seines, and captured a total of 19,757 animals representing 67 taxa (Table CK02-01 and Appendix CK02-02). *Anchoa mitchilli* (n=9,013) accounted for 45.6% of the total number of individuals captured in the lower Suwannee River. *Lagodon rhomboides* (n=2,477) was the second most abundant species caught representing 12.5% of the total catch.

The 21.3-m river seine caught a total of 9,359 animals, accounting for 47.4% of the total Lower Suwannee River collections (Table CK02-01 and -10). The overall mean density estimate for animals captured in this gear was 229 animals/100-m^2. *Anchoa mitchilli* (n=3,839) accounted for 41.0% of the total catch. *Menidia* spp. (n=1,428), *L. rhomboides* (n=1,082), and *Eucinostomus* spp. (n=1,007) were the next three most abundant taxa collected.

Twelve Selected Taxa (n=747) accounted for 8.0% of the total Lower Suwannee River seine catch (Table CK02-11). *Leiostomus xanthurus* (n=581) comprised the majority (77.8%) of the Selected Taxa captured.

6.1-m River Otter Trawl: A total of 10,398 animals were collected in 6.1-m river otter trawl samples and accounted for 52.6% of the total number of individuals captured during lower Suwannee River sampling (Table CK02-01 and -12). The overall mean density estimate for animals captured in this gear was 24 animals/100-m^2. *Anchoa mitchilli* (n=5,174) dominated the catch (49.8% of the total catch) followed by *L. xanthurus* (n=1,658) and *L. rhomboides* (n=1,395).

Eleven Selected Taxa (n=2,763) accounted for 26.6% of the total lower Suwannee River trawl catch (Table CK02-13). *Leiostomus xanthurus* (n=1,658) comprised 60.0% of the Selected Taxa captured. *Callinectes sapidus* (n=450), *F. duorarum* (n=221), and *C. arenarius* (n=212) were the next three most abundant species.

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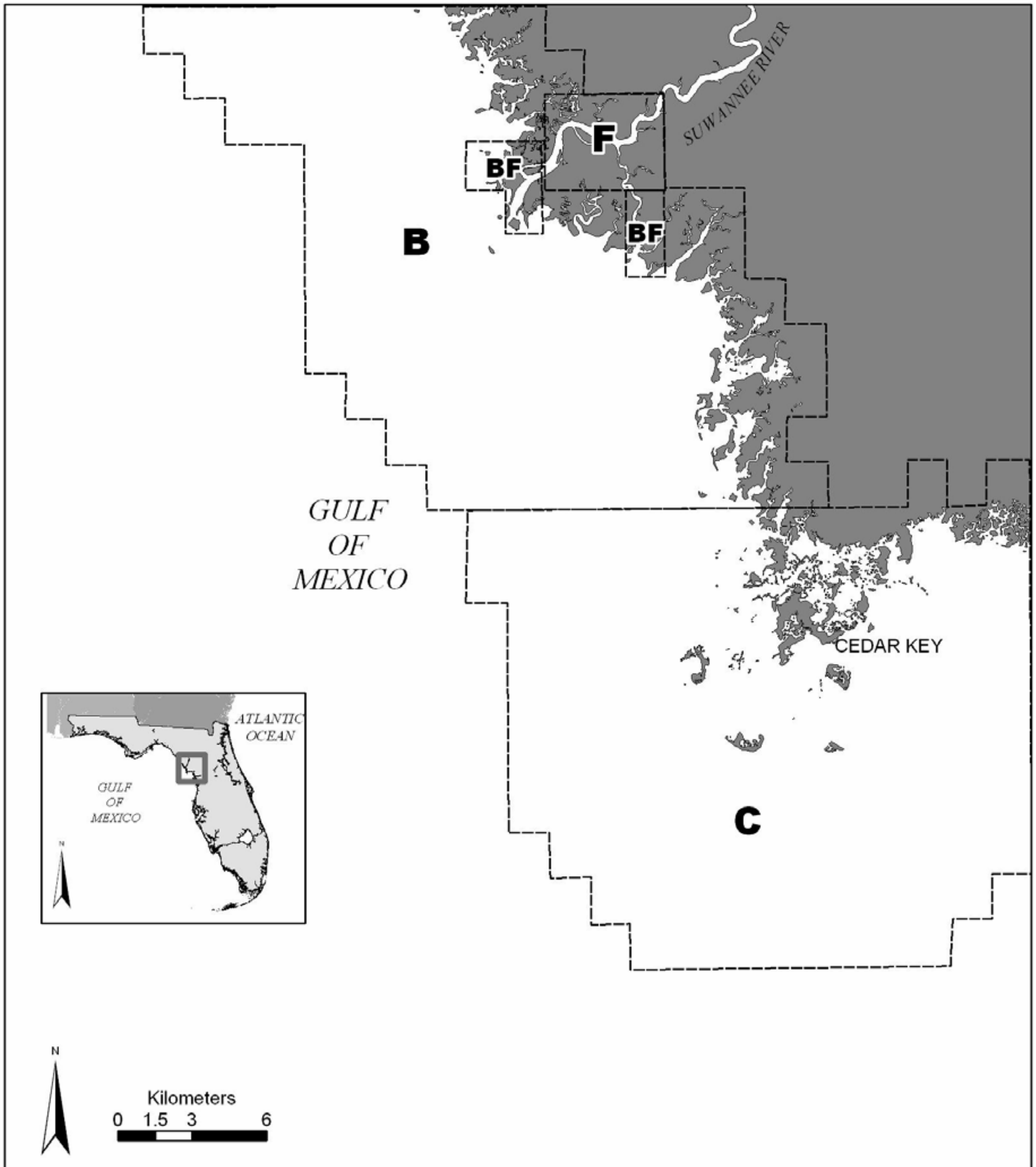

Figure CK02-01. Map of Cedar Key sampling area. Zones are labeled B, C, and F.

Table CK02-01. Summary of catch and effort data for Cedar Key and lower Suwannee River stratified-random sampling, 2002.

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	17,163	120	39,947	108	13,869	96	6,925	61	77,904	385
C	14,238	132	.	.	17,226	96	4,994	59	36,458	287
F	.	.	9,359	60	.	.	10,398	60	19,757	120
Totals	**31,401**	**252**	**49,306**	**168**	**31,095**	**192**	**22,317**	**180**	**134,119**	**792**

Table CK02-02. Catch statistics for 10 dominant taxa collected in 252 21.3-m bay seine samples during Cedar Key stratified-random sampling, 2002. 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**		**%**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**	**Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	10,686	34.0	34.5	30.29	8.21	430.13	970.00	36	0.08	16	81
Membras martinica	3,019	9.6	15.5	8.56	4.72	876.24	894.29	41	0.20	18	96
Lagodon rhomboides	2,365	7.5	51.2	6.70	1.51	358.76	308.57	37	0.45	11	148
Anchoa hepsetus	2,343	7.5	17.1	6.64	2.99	713.68	497.14	33	0.18	12	106
Bairdiella chrysoura	2,309	7.4	13.1	6.54	3.33	808.73	628.57	47	0.62	9	167
Menidia spp.	2,262	7.2	38.9	6.41	1.31	323.20	169.29	59	0.29	20	103
Eucinostomus spp.	1,628	5.2	27.4	4.61	1.20	411.79	170.71	27	0.17	11	45
Leiostomus xanthurus	1,615	5.1	26.2	4.58	1.28	442.72	232.14	33	0.49	9	194
Harengula jaguana	750	2.4	12.7	2.13	0.86	644.12	175.00	47	0.36	19	126
Orthopristis chrysoptera	707	2.3	10.3	2.00	0.92	729.50	189.29	39	0.69	15	169
Subtotal	27,684	88.2	.	.	.	.	.	.	.	9	194
Totals	**31,401**	**100.0**	**.**	**89.01**	**11.83**	**211.04**	**1,274.29**	**.**	**.**	**2**	**718**

Table CK02-03. Catch statistics for Selected Taxa collected in 252 21.3-m bay seine samples during Cedar Key stratified-random sampling, 2002. 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		%	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%	Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Leiostomus xanthurus	1,615	5.1	26.2	4.58	1.28	442.72	232.14	33	0.49	9	194
Cynoscion arenarius	262	0.8	7.1	0.74	0.41	871.09	97.86	38	0.71	13	89
Farfantepenaeus duorarum	198	0.6	15.9	0.56	0.15	431.15	22.14	10	0.33	2	32
Callinectes sapidus	148	0.5	22.6	0.42	0.09	345.77	17.86	24	2.09	5	142
Menticirrhus americanus	123	0.4	12.3	0.35	0.09	404.20	13.57	52	3.76	16	204
Mugil cephalus	73	0.2	8.7	0.21	0.07	520.14	12.14	72	7.81	19	284
Paralichthys albigutta	51	0.2	11.9	0.14	0.04	392.87	6.43	72	9.37	14	299
Lutjanus griseus	44	0.1	4.8	0.12	0.06	811.83	15.00	31	5.16	13	184
Cynoscion nebulosus	30	0.1	6.7	0.09	0.02	418.92	2.86	43	4.81	14	108
Mugil curema	27	0.1	0.4	0.08	0.08	1,587.45	19.29	44	1.05	37	57
Mugil gyrans	26	0.1	4.4	0.07	0.03	695.70	6.43	40	7.64	15	148
Sciaenops ocellatus	17	0.1	2.8	0.05	0.03	836.11	5.71	85	20.02	22	319
Lutjanus synagris	11	0.0	2.0	0.03	0.02	849.58	3.57	43	6.99	19	94

Table CK02-03. (Continued)

Species	Number		%	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%	Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Trachinotus falcatus	9	0.0	1.6	0.03	0.02	978.90	3.57	33	3.34	23	57
Pogonias cromis	8	0.0	2.4	0.02	0.01	681.43	1.43	139	30.38	76	313
Trachinotus carolinus	5	0.0	0.8	0.01	0.01	1,142.62	2.14	38	1.96	34	45
Menippe spp.	4	0.0	1.6	0.01	0.01	788.97	0.71	18	7.32	7	39
Scomberomorus maculatus	4	0.0	1.6	0.01	0.01	788.97	0.71	34	5.04	23	47
Elops saurus	1	0.0	0.4	0.00	0.00	1,587.45	0.71	221	.	221	221
Micropogonias undulatus	1	0.0	0.4	0.00	0.00	1,587.45	0.71	179	.	179	179
Paralichthys lethostigma	1	0.0	0.4	0.00	0.00	1,587.45	0.71	205	.	205	205
Totals	**2,658**	**8.5**	**61.9**	**7.53**	**1.39**	**292.39**	**235.71**	**.**	**.**	**2**	**319**

Table CK02-04. Catch statistics for 10 dominant taxa collected in 192 183-m haul seine samples during Cedar Key stratified-random sampling, 2002. 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**		**%**	**Catch-per-unit-effort (animals/set)**				**Standard Length (mm)**			
	No.	**%**	**Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	8,615	27.7	80.2	44.87	6.71	207.24	630.00	101	0.30	45	231
Bairdiella chrysoura	8,601	27.7	33.9	44.80	24.03	743.14	4,513.00	122	0.23	55	195
Leiostomus xanthurus	2,403	7.7	49.5	12.52	2.74	302.90	389.00	122	0.70	20	261
Mugil cephalus	1,817	5.8	76.0	9.46	1.27	186.10	132.00	234	1.47	30	424
Dasyatis sabina	1,672	5.4	73.4	8.71	1.35	214.84	193.00	223	1.04	68	450
Bagre marinus	1,128	3.6	20.3	5.88	2.30	541.88	364.00	121	0.87	46	441
Harengula jaguana	1,046	3.4	30.7	5.45	1.54	392.07	245.00	94	0.49	64	200
Orthopristis chrysoptera	633	2.0	28.6	3.30	0.75	316.99	83.00	103	1.13	50	198
Brevoortia spp.	547	1.8	25.5	2.85	0.71	343.49	74.00	130	1.36	76	252
Ogcocephalus radiatus	506	1.6	25.5	2.64	0.54	284.65	48.00	152	1.19	40	270
Subtotal	26,968	86.7	.	.	.	.	.	.	.	20	450
Totals	**31,095**	**100.0**	**.**	**161.95**	**25.91**	**221.64**	**4,536.00**	**.**	**.**	**13**	**1200**

Table CK02-05. Catch statistics for Selected Taxa collected in 192 183-m haul seine samples during Cedar Key stratified-random sampling, 2002. 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		%	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%	Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Leiostomus xanthurus	2,403	7.7	49.5	12.52	2.74	302.90	389.00	122	0.70	20	261
Mugil cephalus	1,817	5.8	76.0	9.46	1.27	186.10	132.00	234	1.47	30	424
Sciaenops ocellatus	192	0.6	39.6	1.00	0.14	190.34	9.00	390	10.19	64	678
Pogonias cromis	182	0.6	28.6	0.95	0.20	292.22	31.00	495	22.82	60	900
Elops saurus	179	0.6	32.3	0.93	0.24	360.39	40.00	273	4.51	82	450
Micropogonias undulatus	176	0.6	10.4	0.92	0.33	501.89	46.00	154	1.73	79	205
Paralichthys albigutta	151	0.5	36.5	0.79	0.11	196.09	9.00	147	5.60	40	401
Menticirrhus americanus	138	0.4	19.3	0.72	0.14	276.58	15.00	180	3.94	91	297
Archosargus probatocephalus	128	0.4	26.6	0.67	0.12	251.90	11.00	327	8.78	54	501
Cynoscion nebulosus	125	0.4	25.5	0.65	0.15	325.48	22.00	206	7.29	56	527
Mugil curema	121	0.4	13.5	0.63	0.17	383.69	16.00	173	3.96	49	336
Callinectes sapidus	113	0.4	21.4	0.59	0.14	317.87	15.00	87	4.07	19	179
Mugil gyrans	90	0.3	8.3	0.47	0.20	604.94	30.00	147	3.56	75	232
Cynoscion arenarius	44	0.1	5.2	0.23	0.15	928.04	29.00	185	4.62	128	247

Table CK02-05. (Continued)

Species	Number		%	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%	Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Farfantepenaeus duorarum	36	0.1	7.8	0.19	0.06	435.32	8.00	26	1.05	13	38
Lutjanus griseus	35	0.1	4.2	0.18	0.14	1,038.58	26.00	173	5.80	41	246
Scomberomorus maculatus	35	0.1	9.9	0.18	0.05	413.69	7.00	200	19.51	112	482
Trachinotus falcatus	23	0.1	4.7	0.12	0.05	598.70	7.00	86	6.74	40	168
Paralichthys lethostigma	16	0.1	6.8	0.08	0.02	394.73	2.00	277	18.30	131	371
Mycteroperca microlepis	2	0.0	0.5	0.01	0.01	1,385.64	2.00	186	16.00	170	202
Pomatomus saltatrix	2	0.0	1.0	0.01	0.01	977.23	1.00	104	0.50	103	104
Menticirrhus saxatilis	2	0.0	0.5	0.01	0.01	1,385.64	2.00	134	7.50	126	141
Rachycentron canadum	1	0.0	0.5	0.01	0.01	1,385.64	1.00	975	.	975	975
Trachinotus carolinus	1	0.0	0.5	0.01	0.01	1,385.64	1.00	379	.	379	379
Lutjanus synagris	1	0.0	0.5	0.01	0.01	1,385.64	1.00	87	.	87	87
Totals	**6,013**	**19.3**	**96.9**	**31.32**	**3.24**	**143.37**	**403.00**	**.**	**.**	**13**	**975**

Table CK02-06. Catch statistics for 10 dominant taxa collected in 120 bay 6.1-m otter trawl samples during Cedar Key stratified-random sampling, 2002. 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**		**%**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**	**Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	3,721	31.2	22.5	2.09	0.91	475.13	96.33	49	0.16	15	80
Lagodon rhomboides	1,469	12.3	45.0	0.83	0.34	444.48	32.78	82	0.63	15	136
Bairdiella chrysoura	1,253	10.5	28.3	0.70	0.21	332.76	19.43	104	0.75	20	162
Orthopristis chrysoptera	1,016	8.5	40.0	0.57	0.16	309.74	12.55	96	1.00	10	190
Cynoscion arenarius	986	8.3	10.8	0.55	0.31	615.46	25.70	55	1.00	12	204
Etropus crossotus	331	2.8	55.8	0.19	0.03	190.93	2.90	77	1.20	23	140
Prionotus scitulus	306	2.6	50.0	0.17	0.03	190.87	1.96	96	1.54	26	159
Eucinostomus gula	276	2.3	19.2	0.16	0.05	365.58	3.78	78	0.61	26	100
Leiostomus xanthurus	260	2.2	18.3	0.15	0.06	485.19	6.14	94	1.97	13	198
Monacanthus hispidus	185	1.6	19.2	0.10	0.05	484.56	4.86	63	1.19	25	128
Subtotal	9,803	82.3	.	.	.	.	.	.	.	10	204
Totals	**11,919**	**100.0**	**.**	**6.70**	**1.34**	**218.62**	**102.20**	**.**	**.**	**4**	**1150**

Table CK02-07. Catch statistics for Selected Taxa collected in 120 bay 6.1-m otter trawl samples during Cedar Key stratified-random sampling, 2002. 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**		**%**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**	**Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Cynoscion arenarius	986	8.3	10.8	0.55	0.31	615.46	25.70	55	1.00	12	204
Leiostomus xanthurus	260	2.2	18.3	0.15	0.06	485.19	6.14	94	1.97	13	198
Menippe spp.	168	1.4	38.3	0.09	0.02	253.32	1.82	30	0.87	4	73
Menticirrhus americanus	152	1.3	20.0	0.09	0.03	330.02	1.69	76	4.71	13	241
Farfantepenaeus duorarum	123	1.0	19.2	0.07	0.03	415.74	2.29	19	0.59	7	40
Micropogonias undulatus	92	0.8	3.3	0.05	0.04	944.18	5.33	87	2.10	72	165
Paralichthys albigutta	54	0.5	27.5	0.03	0.01	188.58	0.20	122	6.57	42	268
Lutjanus synagris	28	0.2	9.2	0.02	0.01	358.93	0.34	76	4.68	18	122
Callinectes sapidus	10	0.1	5.0	0.01	0.00	455.78	0.13	98	16.33	34	184
Cynoscion nebulosus	10	0.1	5.0	0.01	0.00	529.47	0.27	94	18.04	25	183
Sciaenops ocellatus	4	0.0	1.7	0.00	0.00	863.84	0.20	78	18.70	24	109
Mycteroperca microlepis	3	0.0	0.8	0.00	0.00	1,095.45	0.20	200	5.51	194	211
Archosargus probatocephalus	1	0.0	0.8	0.00	0.00	1,095.45	0.07	156	.	156	156
Totals	**1,891**	**15.9**	**72.5**	**1.06**	**0.42**	**437.32**	**38.38**	**.**	**.**	**4**	**268**

Table CK02-08. Catch statistics for 10 dominant taxa collected in 108 21.3-m river seine samples during Cedar Key stratified-random sampling, 2002. 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**		**%**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**	**Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	26,647	66.7	57.4	362.84	145.24	415.98	11,929.41	32	0.05	13	74
Leiostomus xanthurus	2,648	6.6	54.6	36.06	9.01	259.58	532.35	27	0.23	11	131
Menidia spp.	2,213	5.5	83.3	30.13	5.07	175.01	357.35	51	0.27	16	100
Eucinostomus spp.	1,617	4.0	44.4	22.02	5.05	238.29	305.88	30	0.16	10	44
Membras martinica	1,218	3.0	15.7	16.58	7.08	443.77	555.88	36	0.41	21	90
Harengula jaguana	1,184	3.0	18.5	16.12	7.93	511.03	680.88	51	0.35	21	84
Lagodon rhomboides	997	2.5	68.5	13.58	2.06	157.75	120.59	40	0.78	11	167
Bairdiella chrysoura	711	1.8	24.1	9.68	3.29	352.95	280.88	62	0.83	9	114
Eucinostomus harengulus	350	0.9	25.0	4.77	1.40	305.90	108.82	53	0.46	40	74
Callinectes sapidus	286	0.7	44.4	3.89	1.05	279.76	94.12	26	1.86	6	177
Subtotal	37,871	94.7	.	.	.	.	.	.	.	6	177
Totals	**39,947**	**100.0**	**.**	**543.94**	**147.02**	**280.90**	**11,986.76**	**.**	**.**	**4**	**482**

Table CK02-09. Catch statistics for Selected Taxa collected in 108 21.3-m river seine samples during Cedar Key stratified-random sampling, 2002. 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		%	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%	Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Leiostomus xanthurus	2,648	6.6	54.6	36.06	9.01	259.58	532.35	27	0.23	11	131
Callinectes sapidus	286	0.7	44.4	3.89	1.05	279.76	94.12	26	1.86	6	177
Mugil cephalus	198	0.5	17.6	2.70	1.41	543.64	145.59	32	1.54	18	136
Farfantepenaeus duorarum	197	0.5	26.9	2.68	1.01	392.32	97.06	10	0.26	4	23
Cynoscion arenarius	180	0.5	23.1	2.45	0.67	284.75	48.53	43	1.04	13	93
Cynoscion nebulosus	107	0.3	26.9	1.46	0.32	225.27	17.65	49	2.72	13	152
Sciaenops ocellatus	30	0.1	14.8	0.41	0.13	329.55	8.82	82	19.83	13	482
Menticirrhus americanus	27	0.1	6.5	0.37	0.18	501.59	16.18	38	2.91	14	69
Paralichthys albigutta	13	0.0	7.4	0.18	0.08	464.40	7.35	85	26.27	25	298
Scomberomorus maculatus	9	0.0	1.9	0.12	0.11	929.88	11.76	24	1.18	22	33
Lutjanus griseus	7	0.0	4.6	0.10	0.05	528.31	4.41	36	10.04	12	74
Mugil gyrans	7	0.0	5.6	0.10	0.04	436.04	2.94	24	5.19	10	53
Mugil curema	6	0.0	0.9	0.08	0.08	1,039.23	8.82	53	2.63	42	59
Archosargus probatocephalus	5	0.0	4.6	0.07	0.03	455.99	1.47	198	60.22	96	391
Paralichthys lethostigma	4	0.0	3.7	0.05	0.03	512.28	1.47	267	10.15	245	294
Menippe spp.	1	0.0	0.9	0.01	0.01	1,039.23	1.47	38	.	38	38
Lutjanus synagris	1	0.0	0.9	0.01	0.01	1,039.23	1.47	23	.	23	23
Totals	**3,726**	**9.3**	**86.1**	**50.74**	**9.63**	**197.15**	**564.71**	**.**	**.**	**4**	**482**

Table CK02-10. Catch statistics for 10 dominant taxa collected in 60 21.3-m river seine samples during lower Suwannee River stratified-random sampling, 2002. 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		%	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%	Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Anchoa mitchilli	3,839	41.0	31.7	94.09	46.67	384.17	2,564.71	30	0.11	12	60
Menidia spp.	1,428	15.3	65.0	35.00	11.19	247.56	492.65	53	0.54	11	100
Lagodon rhomboides	1,082	11.6	56.7	26.52	13.68	399.63	755.88	30	0.46	11	102
Eucinostomus spp.	1,007	10.8	35.0	24.68	10.09	316.71	436.76	28	0.18	12	40
Leiostomus xanthurus	581	6.2	23.3	14.24	7.42	403.45	295.59	27	0.47	12	115
Eucinostomus harengulus	219	2.3	40.0	5.37	2.61	376.49	145.59	59	0.68	31	93
Lucania parva	197	2.1	21.7	4.83	1.71	273.74	67.65	25	0.38	8	36
Gambusia holbrooki	180	1.9	13.3	4.41	2.24	392.78	92.65	30	0.48	16	43
Bairdiella chrysoura	163	1.7	11.7	4.00	3.44	666.28	205.88	101	1.34	36	128
Callinectes sapidus	124	1.3	46.7	3.04	0.66	168.30	23.53	39	3.42	5	173
Subtotal	8,820	94.2	.	.	.	.	.	.	.	5	173
Totals	**9,359**	**100.0**	**.**	**229.39**	**53.79**	**181.63**	**2,710.29**	**.**	**.**	**5**	**405**

Table CK02-11. Catch statistics for Selected Taxa collected in 60 21.3-m river seine samples during lower Suwannee River stratified-random sampling, 2002. 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		%	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%	Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Leiostomus xanthurus	581	6.2	23.3	14.24	7.42	403.45	295.59	27	0.47	12	115
Callinectes sapidus	124	1.3	46.7	3.04	0.66	168.30	23.53	39	3.42	5	173
Cynoscion nebulosus	15	0.2	5.0	0.37	0.24	513.55	11.76	40	3.10	18	62
Lutjanus griseus	13	0.1	11.7	0.32	0.15	361.44	7.35	55	8.85	12	115
Sciaenops ocellatus	4	0.0	3.3	0.10	0.08	609.25	4.41	125	93.47	27	405
Mugil cephalus	3	0.0	3.3	0.07	0.05	573.42	2.94	68	41.00	26	150
Cynoscion arenarius	2	0.0	3.3	0.05	0.03	543.06	1.47	34	2.00	32	36
Farfantepenaeus duorarum	1	0.0	1.7	0.02	0.02	774.60	1.47	10	.	10	10
Archosargus probatocephalus	1	0.0	1.7	0.02	0.02	774.60	1.47	147	.	147	147
Menticirrhus americanus	1	0.0	1.7	0.02	0.02	774.60	1.47	21	.	21	21
Mugil curema	1	0.0	1.7	0.02	0.02	774.60	1.47	22	.	22	22
Paralichthys albigutta	1	0.0	1.7	0.02	0.02	774.60	1.47	89	.	89	89
Totals	**747**	**8.0**	**61.7**	**18.31**	**7.75**	**328.00**	**313.24**	**.**	**.**	**5**	**405**

Table CK02-12. Catch statistics for 10 dominant taxa collected in 60 river 6.1-m otter trawl samples during lower Suwannee River stratified-random sampling, 2002. 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**		**%**					**Standard Length (mm)**			
	No.	**%**	**Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	5,174	49.8	45.0	11.64	5.05	335.90	264.17	31	0.16	16	65
Leiostomus xanthurus	1,658	15.9	31.7	3.74	1.39	287.43	60.98	22	0.30	9	151
Lagodon rhomboides	1,395	13.4	31.7	3.14	1.62	398.52	73.26	19	0.18	12	94
Eucinostomus spp.	617	5.9	33.3	1.39	0.59	328.30	30.36	23	0.24	10	39
Callinectes sapidus	450	4.3	76.7	1.03	0.23	175.48	9.85	57	2.67	2	189
Farfantepenaeus duorarum	221	2.1	33.3	0.54	0.22	309.71	11.97	11	0.20	4	23
Cynoscion arenarius	212	2.0	30.0	0.54	0.32	459.45	16.70	44	0.88	15	89
Menticirrhus americanus	123	1.2	21.7	0.33	0.26	618.58	15.85	39	2.29	13	294
Symphurus plagiusa	128	1.2	25.0	0.30	0.12	301.73	5.40	40	1.31	16	137
Eucinostomus harengulus	74	0.7	30.0	0.17	0.06	273.26	2.70	56	1.44	40	100
Subtotal	10,052	96.5	.	.	.	.	.	.	.	2	294
Totals	**10,398**	**100.0**	**.**	**23.60**	**5.90**	**193.52**	**285.89**	**.**	**.**	**2**	**1035**

Table CK02-13. Catch statistics for Selected Taxa collected in 60 river 6.1-m otter trawl samples during lower Suwannee River stratified-random sampling, 2002. 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		%					Standard Length (mm)			
	No.	%	Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Leiostomus xanthurus	1,658	15.9	31.7	3.74	1.39	287.43	60.98	22	0.30	9	151
Callinectes sapidus	450	4.3	76.7	1.03	0.23	175.48	9.85	57	2.67	2	189
Farfantepenaeus duorarum	221	2.1	33.3	0.54	0.22	309.71	11.97	11	0.20	4	23
Cynoscion arenarius	212	2.0	30.0	0.54	0.32	459.45	16.70	44	0.88	15	89
Menticirrhus americanus	123	1.2	21.7	0.33	0.26	618.58	15.85	39	2.29	13	294
Lutjanus griseus	36	0.3	21.7	0.08	0.03	262.54	1.08	73	4.66	15	172
Sciaenops ocellatus	26	0.3	13.3	0.06	0.02	327.37	1.08	31	2.99	16	88
Paralichthys albigutta	17	0.2	18.3	0.04	0.01	260.83	0.54	148	22.43	34	332
Cynoscion nebulosus	15	0.1	11.7	0.04	0.02	383.14	0.94	50	17.86	12	264
Archosargus probatocephalus	3	0.0	5.0	0.01	0.00	439.57	0.13	201	76.00	97	349
Paralichthys lethostigma	2	0.0	3.3	0.00	0.00	543.06	0.13	142	22.50	119	164
Totals	**2,763**	**26.6**	**93.3**	**6.40**	**1.53**	**185.42**	**64.49**	**.**	**.**	**2**	**349**

Appendix CK02-01. Monthly summary of species collected during Cedar Key and lower Suwannee River stratified-random sampling, 2002. 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
Achirus lineatus	.	.	.	.	.	2	.	5	5	3	.	.	15
Acipenser oxyrhynchus	.	.	.	.	.	.	.	.	.	.	1	.	1
Adinia xenica	39	.	.	.	.	.	2	.	.	.	130	3	174
Aetobatis narinari	.	.	.	.	.	.	.	1	.	2	.	.	3
Aluterus schoepfi	2	.	.	.	3	2	6	2	.	4	.	.	19
Ameiurus catus	.	.	1	.	.	1	2	.	2	1	.	3	10
Anarchopterus criniger	.	2	.	.	.	.	.	.	.	.	.	1	3
Anchoa hepsetus	.	6	3	10	2,054	149	120	80	33	75	7	.	2,537
Anchoa mitchilli	1,319	1,181	69	1,842	1,238	9,110	1,395	8,814	10,643	10,768	3,598	90	50,067
Ancylopsetta quadrocellata	.	2	2	5	1	.	2	.	2	4	.	.	18
Archosargus probatocephalus	3	14	17	11	14	9	9	13	11	17	11	9	138
Arius felis	3	13	16	29	32	25	87	231	289	303	71	1	1,100
Astroscopus y-graecum	.	.	2	.	.	.	.	.	.	.	.	.	2
Bagre marinus	.	.	.	.	5	1	35	491	639	94	42	.	1,307
Bairdiella chrysoura	4,592	96	363	238	1,979	1,264	466	1,108	983	714	1,145	123	13,071
Bathygobius soporator	.	.	.	.	.	.	.	.	5	3	3	1	12
Brevoortia spp.	1	65	29	239	21	5	25	72	83	74	116	8	738
Calamus arctifrons	3	.	.	.	.	1	15	.	3	29	1	2	54
Callinectes sapidus	46	180	93	74	37	52	82	62	47	70	135	253	1,131
Caranx hippos	.	.	.	.	.	1	1	5	6	9	.	.	22
Carcharhinus limbatus	.	.	.	.	.	1	12	.	.	.	.	.	13
Centropristis striata	8	6	2	1	1	15	36	2	33	42	3	1	150
Chaetodipterus faber	5	.	.	.	.	13	11	20	36	34	8	.	127
Chasmodes saburrae	.	.	.	1	.	2	.	3	1	.	.	.	7
Chilomycterus schoepfi	2	8	13	13	6	15	17	7	6	13	7	6	113

Appendix CK02-01. (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
Chilomycterus spp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Chloroscombrus chrysurus	.	.	.	.	.	.	.	11	46	19	11	.	87
Citharichthys macrops	.	.	.	.	.	.	.	.	.	.	3	.	3
Cynoscion arenarius	4	.	.	6	487	222	56	762	80	49	19	1	1,686
Cynoscion nebulosus	6	10	27	3	10	15	47	52	51	12	35	34	302
Cyprinodon variegatus	6	12	9	.	3	6	6	.	.	.	1	.	43
Dasyatis americana	.	.	.	.	1	.	.	.	.	.	.	.	1
Dasyatis sabina	85	34	106	155	104	149	115	241	251	153	454	69	1,916
Dasyatis say	.	.	6	6	11	5	7	14	21	12	.	.	82
Diplectrum formosum	.	.	.	.	.	.	1	.	1	2	.	.	4
Diplodus holbrooki	2	.	.	.	14	7	9	.	1	2	.	1	36
Dorosoma cepedianum	.	.	2	.	.	.	.	1	.	.	.	1	4
Echeneis naucrates	.	.	.	.	1	2	4	1	1	1	.	.	10
Echeneis neucratoides	.	.	.	.	1	.	.	3	4	14	5	.	27
Elops saurus	40	.	.	13	12	14	9	12	24	25	28	3	180
Enneacanthus gloriosus	.	.	.	1	.	.	.	.	.	.	.	.	1
Etropus crossotus	29	19	13	44	1	31	59	161	166	70	168	28	789
Eucinostomus gula	1	1	.	.	.	.	.	114	206	208	120	80	730
Eucinostomus harengulus	9	1	.	7	11	.	22	240	240	89	278	39	936
Eucinostomus spp.	9	.	.	.	.	74	817	1,132	1,320	426	992	105	4,875
Farfantepenaeus duorarum	.	3	15	32	6	23	109	207	181	70	118	12	776
Farfantepenaeus spp.	20	32	2	.	.	.	.	.	.	.	.	.	54
Floridichthys carpio	.	.	.	.	.	.	1	.	.	.	.	4	5
Fundulus confluentus	.	.	.	.	.	.	3	.	.	.	.	.	3
Fundulus grandis	32	34	27	1	2	7	43	.	.	.	126	83	355
Fundulus majalis	81	53	101	52	15	18	42	27	11	3	3	85	491

Appendix CK02-01. (Continued)

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
	Month												
	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
Fundulus seminolis	.	9	.	.	.	.	48	2	6	1	12	7	85
Gambusia holbrooki	1	12	.	.	.	.	37	.	2	.	1	130	183
Gobiesox strumosus	.	.	.	.	.	.	.	1	.	.	.	.	1
Gobiosoma bosc	.	8	8	2	2	2	36	12	6	37	11	12	136
Gobiosoma longipala	.	.	.	1	.	.	.	.	.	.	.	.	1
Gobiosoma robustum	1	.	.	11	.	2	1	8	.	.	.	.	23
Gobiosoma spp.	.	.	1	1	1	13	2	6	18	1	5	5	53
Gymnura micrura	.	.	.	3	11	11	11	17	17	5	2	.	77
Haemulon aurolineatum	.	2	.	90	.	.	.	1	.	.	.	.	93
Haemulon plumieri	.	.	.	.	.	1	.	.	3	3	.	.	7
Halichoeres bivittatus	.	.	.	.	.	.	.	.	8	1	.	.	9
Harengula jaguana	.	.	2	73	57	45	36	1,382	474	469	129	402	3,069
Hemicaranx amblyrhynchus	.	.	.	.	.	.	.	.	.	1	.	.	1
Heterandria formosa	.	.	.	.	.	.	.	1	.	.	.	.	1
Hippocampus erectus	.	.	.	1	.	.	.	1	.	.	.	.	2
Hippocampus zosterae	.	2	.	.	.	.	.	.	.	.	.	.	2
Hypleurochilus caudovittatus	.	.	.	1	.	.	5	1	2	3	.	.	12
Hyporhamphus meeki	.	.	.	.	7	.	1	1	3	1	.	.	13
Hyporhamphus unifasciatus	.	.	.	.	1	17	.	.	.	.	.	.	18
Hypsoblennius hentzi	.	.	1	2	.	12	2	.	.	1	.	.	18
Ictalurus punctatus	.	.	.	2	.	.	.	.	.	.	.	1	3
Lactophrys quadricornis	3	.	10	3	.	7	8	.	2	11	.	4	48
Lagodon rhomboides	834	1,615	2,259	1,828	741	1,263	1,322	613	1,254	1,668	1,828	698	15,923
Leiostomus xanthurus	103	2,680	2,851	606	481	771	348	494	474	158	156	43	9,165
Lepisosteus osseus	.	.	.	1	2	.	1	2	2	4	1	4	17
Lepisosteus platyrhincus	.	.	.	.	.	.	2	.	1	.	.	.	3

Appendix CK02-01. (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
Lepomis auritus	.	.	.	.	1	.	.	.	.	.	.	36	37
Lepomis macrochirus	.	.	1	3	2	.	.	.	7	.	.	.	13
Lepomis microlophus	.	.	.	1	2	.	.	.	.	.	.	.	3
Lepomis punctatus	.	.	.	.	.	.	9	1	13	.	1	.	24
Limulus polyphemus	4	3	4	12	1	.	1	.	5	3	10	1	44
Lobotes surinamensis	.	.	.	.	.	.	1	.	.	.	.	.	1
Lucania goodei	.	.	.	.	.	.	.	1	.	.	.	7	8
Lucania parva	1	1	9	1	1	.	57	26	16	.	3	93	208
Lutjanus griseus	.	.	4	1	3	.	30	7	46	16	20	8	135
Lutjanus synagris	.	.	.	.	.	.	6	.	11	16	7	1	41
Membras martinica	.	.	14	.	786	2,704	298	191	261	7	1	.	4,262
Menidia spp.	58	264	426	531	169	676	434	890	865	577	551	463	5,904
Menippe spp.	2	13	32	13	3	11	40	15	14	13	1	16	173
Menticirrhus americanus	2	1	7	14	39	51	61	220	83	44	41	1	564
Menticirrhus saxatilis	.	.	2	.	.	.	.	.	.	.	.	.	2
Microgobius gulosus	1	1	2	10	1	8	42	10	8	6	14	15	118
Microgobius thalassinus	.	.	1	1	.	.	.	4	4	14	.	1	25
Micropogonias undulatus	.	.	.	.	79	6	42	42	94	6	.	.	269
Micropterus notius	.	.	.	.	4	.	.	.	.	.	.	.	4
Micropterus salmoides	.	.	.	2	2	.	5	.	3	.	.	.	12
Monacanthus ciliatus	7	14	1	1	1	25	11	1	12	26	.	3	102
Monacanthus hispidus	.	1	.	.	11	29	112	9	23	16	8	.	209
Monacanthus setifer	.	.	.	.	.	.	.	.	.	.	.	1	1
Mugil cephalus	271	266	340	427	104	115	123	45	36	65	82	217	2,091
Mugil curema	12	7	14	23	2	52	1	.	3	13	20	8	155
Mugil gyrans	.	.	4	.	.	8	3	8	4	14	40	42	123

Appendix CK02-01. (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
Mycteroperca microlepis	.	.	.	.	.	.	.	.	2	3	.	.	5
Myrophis punctatus	.	.	.	1	.	.	.	.	.	.	.	.	1
Narcine brasiliensis	.	.	.	1	.	.	.	.	.	.	.	.	1
Ogcocephalus radiatus	.	75	19	86	22	68	51	43	27	102	76	39	608
Oligoplites saurus	.	.	.	.	3	40	40	22	56	44	56	.	261
Ophidion holbrooki	.	.	.	.	.	.	1	.	.	.	.	.	1
Opisthonema oglinum	.	.	.	.	34	3	.	11	90	15	14	2	169
Opsanus beta	.	1	2	3	1	1	9	5	4	9	3	.	38
Orthopristis chrysoptera	24	.	3	30	558	220	478	143	360	393	136	28	2,373
Parablennius marmoreus	.	.	.	.	.	1	2	.	1	.	.	.	4
Paralichthys albigutta	4	24	27	24	36	32	20	34	25	27	29	5	287
Paralichthys lethostigma	3	3	3	2	3	2	2	2	2	.	1	.	23
Peprilus alepidotus	.	.	.	.	4	6	.	2	.	.	.	.	12
Peprilus burti	.	.	3	1	.	.	1	.	.	.	24	.	29
Poecilia latipinna	.	.	.	.	.	.	.	.	.	.	7	.	7
Pogonias cromis	6	6	.	10	20	12	40	36	15	28	12	5	190
Pomatomus saltatrix	.	.	1	1	.	.	.	.	.	.	.	.	2
Prionotus scitulus	9	5	8	10	9	30	26	13	53	32	120	23	338
Prionotus tribulus	7	13	6	11	2	4	3	11	25	12	22	3	119
Rachycentron canadum	.	.	.	.	1	.	.	.	.	.	.	.	1
Raja texana	.	.	.	.	.	.	.	.	1	.	.	.	1
Rhinoptera bonasus	.	.	1	16	30	37	14	34	55	12	6	.	205
Rhizoprionodon terraenovae	.	.	.	.	.	.	.	1	.	.	.	.	1
Sciaenops ocellatus	27	23	30	21	19	20	31	7	11	14	37	33	273
Scomberomorus maculatus	1	.	.	1	1	3	.	15	18	2	7	.	48
Selene vomer	.	.	.	.	.	4	14	2	9	3	.	.	32

Appendix CK02-01. (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**
Serraniculus pumilio	.	.	.	.	.	.	.	1	1	1	.	.	3
Serranus subligarius	.	.	.	.	.	.	.	.	2	1	.	.	3
Sparisoma radians	.	.	.	.	.	.	.	.	1	.	1	.	2
Sphoeroides nephelus	3	4	3	7	88	21	12	3	12	13	23	1	189
Sphyraena borealis	.	.	.	.	.	.	2	.	.	.	.	.	2
Sphyraena guachancho	.	.	.	.	.	.	.	.	.	.	1	.	1
Sphyrna tiburo	.	.	1	.	4	7	2	7	15	9	3	.	48
Starksia ocellata	.	.	.	1	.	.	.	.	.	1	.	.	2
Strongylura marina	12	13	12	6	3	113	15	12	7	4	12	2	211
Strongylura notata	.	.	.	.	1	.	.	.	3	.	.	.	4
Strongylura spp.	.	.	.	.	7	.	8	2	.	.	.	.	17
Strongylura timucu	1	.	.	1	7	10	24	9	8	1	.	.	61
Symphurus plagiusa	3	7	7	44	2	8	26	60	17	25	63	4	266
Syngnathidae spp.	.	.	.	.	.	.	1	.	.	.	.	.	1
Syngnathus floridae	4	20	2	6	5	22	25	4	21	23	9	15	156
Syngnathus louisianae	.	.	.	3	4	.	5	.	1	7	5	.	25
Syngnathus scovelli	3	6	2	.	15	31	15	.	2	8	12	3	97
Synodus foetens	1	1	.	6	10	23	20	10	13	19	18	3	124
Trachinotus carolinus	.	.	.	.	.	5	.	.	.	.	1	.	6
Trachinotus falcatus	.	.	.	.	.	.	7	5	10	6	2	2	32
Trinectes maculatus	.	.	3	2	4	4	15	12	11	4	28	9	92
Urophycis floridana	3	10	13	2	.	.	.	.	.	.	.	.	28
Totals	**7,758**	**6,882**	**7,057**	**6,744**	**9,478**	**17,796**	**7,718**	**18,412**	**20,089**	**17,432**	**11,311**	**3,442**	**134,119**

Appendix CK02-02. Summary by gear, stratum, and zone of species collected during Cedar Key and lower Suwannee River stratified-random sampling, 2002. Sampling with 21.3-m bay seine and were not pre-stratified. Offshore sets were post-stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 6.1-m otter trawl was 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=27	E=117	E=108	E=168	E=192	E=180	E=385	E=287	E=120	E=792
Achirus lineatus	.	2	10	2	.	1	12	3	.	15
Acipenser oxyrhynchus	.	.	.	.	.	1	.	.	1	1
Adinia xenica	.	.	.	174	.	.	174	.	.	174
Aetobatis narinari	.	1	.	.	2	.	2	1	.	3
Aluterus schoepfi	1	.	.	.	.	18	4	15	.	19
Ameiurus catus	.	.	.	4	.	6	.	.	10	10
Anarchopterus criniger	.	.	.	.	.	3	2	.	1	3
Anchoa hepsetus	54	1,611	678	125	1	68	391	2,135	11	2,537
Anchoa mitchilli	42	6,092	4,552	30,486	.	8,895	36,884	4,170	9,013	50,067
Ancylopsetta quadrocellata	.	.	.	.	10	8	5	13	.	18
Archosargus probatocephalus	.	.	.	6	128	4	112	22	4	138
Arius felis	1	323	172	1	432	171	293	802	5	1,100
Astroscopus y-graecum	.	2	.	.	.	.	.	2	.	2
Bagre marinus	.	120	10	.	1,128	49	307	1,000	.	1,307
Bairdiella chrysoura	300	941	1,068	874	8,601	1,287	7,785	5,089	197	13,071
Bathygobius soporator	.	.	2	10	.	.	11	.	1	12
Brevoortia spp.	.	18	9	127	547	37	325	369	44	738
Calamus arctifrons	2	.	.	.	.	52	.	54	.	54
Callinectes sapidus	2	75	71	410	113	460	453	104	574	1,131
Caranx hippos	.	.	.	.	22	.	17	5	.	22
Carcharhinus limbatus	.	.	.	.	13	.	2	11	.	13

Appendix CK02-02. (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=27	E=117	E=108	E=168	E=192	E=180	E=385	E=287	E=120	E=792
Centropristis striata	17	5	1	.	2	125	23	127	.	150
Chaetodipterus faber	1	.	1	4	74	47	73	52	2	127
Chasmodes saburrae	.	2	4	.	.	1	2	5	.	7
Chilomycterus schoepfi	7	4	6	1	13	82	31	82	.	113
Chilomycterus spp.	1	.	.	.	.	.	.	1	.	1
Chloroscombrus chrysurus	.	13	20	15	4	35	79	8	.	87
Citharichthys macrops	.	.	.	.	.	3	.	3	.	3
Cynoscion arenarius	.	20	242	182	44	1,198	1,326	146	214	1,686
Cynoscion nebulosus	2	9	19	122	125	25	177	95	30	302
Cyprinodon variegatus	.	1	18	22	2	.	21	21	1	43
Dasyatis americana	.	.	.	.	1	.	.	1	.	1
Dasyatis sabina	1	26	34	1	1,672	182	835	1,056	25	1,916
Dasyatis say	.	4	.	.	73	5	29	53	.	82
Diplectrum formosum	.	.	.	.	.	4	1	3	.	4
Diplodus holbrooki	21	.	.	.	2	13	1	35	.	36
Dorosoma cepedianum	.	.	.	.	4	.	3	1	.	4
Echeneis naucrates	.	.	.	.	8	2	4	4	2	10
Echeneis neucratoides	.	2	.	.	24	1	16	11	.	27
Elops saurus	.	.	1	.	179	.	118	62	.	180
Enneacanthus gloriosus	.	.	.	1	.	.	1	.	.	1
Etropus crossotus	.	12	16	6	414	341	328	451	10	789
Eucinostomus gula	9	55	68	157	160	281	421	292	17	730
Eucinostomus harengulus	11	55	149	569	64	88	471	172	293	936
Eucinostomus spp.	61	456	1,111	2,624	.	623	2,323	928	1,624	4,875
Farfantepenaeus duorarum	30	49	119	198	36	344	377	177	222	776
Farfantepenaeus spp.	11	2	4	2	10	25	5	30	19	54
Floridichthys carpio	.	.	1	4	.	.	4	1	.	5
Fundulus confluentus	.	.	.	3	.	.	.	.	3	3
Fundulus grandis	.	2	60	240	53	.	268	65	22	355

Appendix CK02-02. (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=27	E=117	E=108	E=168	E=192	E=180	E=385	E=287	E=120	E=792
Fundulus majalis	.	5	219	109	158	.	243	248	.	491
Fundulus seminolis	.	.	.	85	.	.	3	.	82	85
Gambusia holbrooki	.	.	.	183	.	.	3	.	180	183
Gobiesox strumosus	.	1	.	.	.	.	.	1	.	1
Gobiosoma bosc	.	17	11	98	.	10	84	1	51	136
Gobiosoma longipala	.	1	.	.	.	.	1	.	.	1
Gobiosoma robustum	2	2	4	1	.	14	2	9	12	23
Gobiosoma spp.	.	8	12	29	.	4	30	7	16	53
Gymnura micrura	.	.	3	.	56	18	35	42	.	77
Haemulon aurolineatum	27	10	23	.	.	33	67	26	.	93
Haemulon plumieri	2	1	.	.	.	4	.	7	.	7
Halichoeres bivittatus	8	1	.	.	.	.	.	9	.	9
Harengula jaguana	20	491	239	1,268	1,046	5	2,376	608	85	3,069
Hemicaranx amblyrhynchus	.	.	.	.	.	1	1	.	.	1
Heterandria formosa	.	.	.	1	.	.	.	.	1	1
Hippocampus erectus	.	.	.	.	.	2	.	2	.	2
Hippocampus zosterae	2	.	.	.	.	.	.	2	.	2
Hypleurochilus caudovittatus	.	.	.	.	.	12	10	2	.	12
Hyporhamphus meeki	1	4	6	.	2	.	3	10	.	13
Hyporhamphus unifasciatus	1	.	17	.	.	.	.	18	.	18
Hypsoblennius hentzi	6	2	.	.	.	10	11	7	.	18
Ictalurus punctatus	.	.	.	.	.	3	.	.	3	3
Lactophrys quadricornis	2	1	.	.	8	37	16	32	.	48
Lagodon rhomboides	430	352	1,583	2,079	8,615	2,864	4,966	8,480	2,477	15,923
Leiostomus xanthurus	5	327	1,283	3,229	2,403	1,918	5,237	1,689	2,239	9,165
Lepisosteus osseus	.	.	.	1	14	2	14	2	1	17
Lepisosteus platyrhincus	.	.	.	2	1	.	.	1	2	3
Lepomis auritus	.	.	.	37	.	.	.	.	37	37
Lepomis macrochirus	.	.	.	13	.	.	.	.	13	13

Appendix CK02-02.	(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=27	E=117	E=108	E=168	E=192	E=180	E=385	E=287	E=120	E=792
Lepomis microlophus	.	.	.	3	.	.	.	.	3	3
Lepomis punctatus	.	.	.	24	.	.	.	.	24	24
Limulus polyphemus	.	.	.	.	39	5	28	16	.	44
Lobotes surinamensis	.	.	.	.	1	.	.	1	.	1
Lucania goodei	.	.	.	8	.	.	.	.	8	8
Lucania parva	.	1	.	207	.	.	11	.	197	208
Lutjanus griseus	.	4	40	20	35	36	61	25	49	135
Lutjanus synagris	9	2	.	1	1	28	22	19	.	41
Membras martinica	1	399	2,619	1,243	.	.	2,738	1,499	25	4,262
Menidia spp.	.	430	1,832	3,641	1	.	3,318	1,158	1,428	5,904
Menippe spp.	1	1	2	1	.	168	120	53	.	173
Menticirrhus americanus	1	44	78	28	138	275	279	161	124	564
Menticirrhus saxatilis	.	.	.	.	2	.	.	2	.	2
Microgobius gulosus	1	39	22	51	.	5	96	3	19	118
Microgobius thalassinus	.	3	22	.	.	.	7	18	.	25
Micropogonias undulatus	.	.	1	.	176	92	109	160	.	269
Micropterus notius	.	.	.	4	.	.	.	.	4	4
Micropterus salmoides	.	.	.	12	.	.	2	.	10	12
Monacanthus ciliatus	36	2	.	.	.	64	9	93	.	102
Monacanthus hispidus	18	.	6	.	.	185	16	193	.	209
Monacanthus setifer	1	.	.	.	.	.	.	1	.	1
Mugil cephalus	.	17	56	201	1,817	.	1,549	539	3	2,091
Mugil curema	.	.	27	7	121	.	81	73	1	155
Mugil gyrans	.	3	23	7	90	.	41	82	.	123
Mycteroperca microlepis	.	.	.	.	2	3	.	5	.	5
Myrophis punctatus	.	.	.	.	.	1	.	.	1	1
Narcine brasiliensis	.	.	.	.	.	1	1	.	.	1
Ogcocephalus radiatus	.	1	.	.	506	101	56	552	.	608
Oligoplites saurus	2	5	130	110	14	.	165	63	33	261

Appendix CK02-02. (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=27	E=117	E=108	E=168	E=192	E=180	E=385	E=287	E=120	E=792
Ophidion holbrooki	.	.	.	.	.	1	.	1	.	1
Opisthonema oglinum	.	1	2	2	158	6	78	91	.	169
Opsanus beta	1	1	.	4	6	26	17	15	6	38
Orthopristis chrysoptera	534	62	111	9	633	1,024	868	1,497	8	2,373
Parablennius marmoreus	.	.	.	.	.	4	3	1	.	4
Paralichthys albigutta	5	18	28	14	151	71	120	149	18	287
Paralichthys lethostigma	.	1	.	4	16	2	16	5	2	23
Peprilus alepidotus	.	.	.	.	12	.	6	6	.	12
Peprilus burti	.	.	.	.	26	3	19	10	.	29
Poecilia latipinna	.	.	.	7	.	.	5	.	2	7
Pogonias cromis	.	1	7	.	182	.	107	83	.	190
Pomatomus saltatrix	.	.	.	.	2	.	1	1	.	2
Prionotus scitulus	1	18	1	3	6	309	178	157	3	338
Prionotus tribulus	.	5	21	11	45	37	69	49	1	119
Rachycentron canadum	.	.	.	.	1	.	.	1	.	1
Raja texana	.	.	.	.	.	1	1	.	.	1
Rhinoptera bonasus	.	1	.	1	203	.	47	158	.	205
Rhizoprionodon terraenovae	.	.	.	.	1	.	.	1	.	1
Sciaenops ocellatus	.	.	17	34	192	30	177	66	30	273
Scomberomorus maculatus	.	1	3	9	35	.	34	14	.	48
Selene vomer	.	1	1	.	27	3	13	19	.	32
Serraniculus pumilio	.	.	.	.	.	3	1	2	.	3
Serranus subligarius	.	.	.	.	.	3	3	.	.	3
Sparisoma radians	.	1	.	.	.	1	1	1	.	2
Sphoeroides nephelus	33	18	78	14	19	27	80	107	2	189
Sphyraena borealis	1	.	.	.	.	1	2	.	.	2
Sphyraena guachancho	.	.	1	.	.	.	1	.	.	1
Sphyrna tiburo	.	.	.	.	47	1	19	29	.	48
Starksia ocellata	.	.	.	.	.	2	.	2	.	2

Appendix CK02-02. (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=27	E=117	E=108	E=168	E=192	E=180	E=385	E=287	E=120	E=792
Strongylura marina	.	8	125	7	71	.	162	48	1	211
Strongylura notata	1	.	1	2	.	.	2	2	.	4
Strongylura spp.	3	.	9	5	.	.	4	10	3	17
Strongylura timucu	.	.	34	26	1	.	29	26	6	61
Symphurus plagiusa	1	30	26	29	7	173	109	28	129	266
Syngnathidae spp.	.	1	.	.	.	.	.	1	.	1
Syngnathus floridae	63	33	7	5	.	48	21	128	7	156
Syngnathus louisianae	8	1	2	.	.	14	8	17	.	25
Syngnathus scovelli	30	43	3	12	1	8	62	22	13	97
Synodus foetens	1	16	23	24	6	54	53	56	15	124
Trachinotus carolinus	.	.	5	.	1	.	2	4	.	6
Trachinotus falcatus	.	.	9	.	23	.	12	20	.	32
Trinectes maculatus	.	4	1	11	14	62	27	27	38	92
Urophycis floridana	4	3	2	.	2	17	20	8	.	28
Totals	**1,836**	**12,344**	**17,221**	**49,306**	**31,095**	**22,317**	**77,904**	**36,458**	**19,757**	**134,119**

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Apalachicola Bay

Apalachicola Bay is a shallow, semi-enclosed estuary bounded by a barrier island complex that includes St. Vincent Island, Cape St. George Island, St. George Island, and Dog Island. The bay is connected to the Gulf of Mexico through three naturally occurring passes: St. Vincent Pass, West Pass, and East Pass; and a man-made pass at Sikes Cut on St. George Island. On the eastern end, the bay is connected to the Gulf through Dog Island Sound. The Apalachicola Bay system is one of the least developed estuaries in the state, surrounded by approximately 48,000 acres of state and federal reserves (ANERR 1998). The towns of Apalachicola, East Point, and Carrabelle are the only substantial areas of development on the bay and support a population of approximately 12,000 people. Apalachicola Bay receives the majority of its freshwater from the Apalachicola River, which drains an area of approximately 50,660 km^2. The Apalachicola River has the highest flow rate (690 m^3/s at Chattahoochee, Florida) and the broadest flood plain (450 km^2) of any river in Florida (Livingston 1983).

The sampling universe for the Apalachicola Bay system is divided into four geographical zones, A, B, C, and D (Figure AP02-01). Zone A is an estuarine habitat that consists of St. Vincent Sound, Apalachicola Bay, and East Bay, and is greatly influenced by freshwater input from the Apalachicola River. Habitats in Zone A are dominated by oyster bars, mud-oyster, sand, and mud bottom types, and to a lesser extent, seagrass beds. Zone B consists of St. George Sound and is characterized as a stable marine environment due to minimal freshwater input. Bottom substrates consist primarily of sand although some oyster and mud bottom types exist. Shallow areas near the mainland and the barrier islands are made up of seagrass meadows of varying density consisting of *Halodule wrightii*, *Thalassia testudinum*, and *Syringodium filiforme*. Zone C consists of the lower Apalachicola River and its distributaries, the St. Marks, the Little St. Marks, and the East rivers. Zone D consists of the Carrabelle River, which lies near the eastern end of the sampling universe.

This section summarizes Fisheries-Independent Monitoring (FIM) program data collected in the Apalachicola Bay region during 2002. Monthly stratified-random sampling (SRS) was conducted year-round in all four geographic zones. Zones A and B were sampled using a 21.3-m bay seine, a 6.1-m otter trawl, and a 183-m haul seine. Zones C and D were sampled using a 21.3-m river seine and a 6.1-m otter trawl. All sampling methods were the same as those described in the Methods section of this report.

Stratified-Random Sampling

A total of 146,597 fishes and selected invertebrates, representing 166 taxa, were collected in 852 samples during Apalachicola Bay stratified-random sampling (Table AP02-01; Appendices AP02-01 and AP02-02). There were 10 species new to SRS collections in 2002. These species were *Ophidion welshi* (crested cusk-eel), *Notropis maculatus* (taillight shiner), *Notropis texanus* (weed shiner), *Notropis cummingsae* (dusky shiner), *Notropis chalybaeus* (ironcolor shiner), *Paraclinus marmoratus* (marbled blenny), *Cynoscion nothus* (silver seatrout), *Calamus arctifrons* (grass porgy), *Hypsoblennius ionthas* (freckled blenny), and *Sphyraena guachancho* (guaguanche). The most abundant taxon collected in Apalachicola SRS collections was *Anchoa mitchilli* (n=28,054), accounting for 19.1% of the total catch. Other commonly captured taxa included *Leiostomus xanthurus* (n=26,389), *Lagodon rhomboides* (n=20,221), *Brevoortia* spp. (n=7,696), *Harengula jaguana* (n=6,978), and *Menidia* spp. (n=6,875). Together with *A. mitchilli*, these species represented 65.6% of the total catch.

Thirty-two Selected Taxa (n=48,895 animals) were collected, accounting for 33.4% of the total catch. The most abundant Selected Taxa were *L. xanthurus* (n=26,389), *Micropogonias undulatus* (n=5,619), *Mugil cephalus* (n=5,493), and *Cynoscion arenarius* (n=3,134). Other commonly collected Selected Taxa included *Farfantepenaeus* spp. (n=1,572), *Callinectes sapidus* (n=785), *Sciaenops ocellatus* (n=765), *Litopenaeus setiferus* (n=737), and *Menticirrhus americanus* (n=613).

Bay Sampling

21.3-m Bay Seines. There were 48,885 fishes and selected invertebrates collected in 240 21.3-m bay seine samples, accounting for 33.3% of the total SRS catch (Table AP02-02, Appendix AP02-02). The mean density estimate for the 21.3-m bay seine was 146 animals/100 m^2. The dominant taxa collected in bay seine samples were *L. xanthurus* (n=15,509) and *L. rhomboides* (n=7,905). These taxa accounted for 47.9% of the total catch with this gear. There were 15,737 animals collected in 76 offshore-vegetated collections, accounting for 32.2% of the total 21.3-m bay seine catch. One hundred and seven shoreline collections yielded 24,705 animals, which accounted for 50.5% of the bay seine catch. Fifty-seven samples were taken from offshore-unvegetated sites yielding 8,447 animals, accounting for 17.3% of the total catch with this gear.

A total of 21,748 animals classified as Selected Taxa were collected with the 21.3-m bay seine (Table AP02-03). Selected Taxa (n=25) represented 44.5% of the total catch with this gear. The most abundant Selected Taxa collected in bay seine samples was *L. xanthurus* (n=15,509), followed by *M. cephalus* (n=3,507).

183-m Haul Seines. A total of 34,652 fishes and selected invertebrates were collected in 216 183-m haul seine samples, accounting for 23.6% of the total catch from 2002 SRS collections (Table AP02-04). The mean catch-per-unit-effort for the 183-m haul seine was 161 animals/set. The two most abundant taxa, *L. rhomboides* (n=10,639) and *H. jaguana* (n=6,591), accounted for 49.7% of the total catch with this gear. *Leiostomus xanthurus* (n=3,149) and *Bairdiella chrysoura* (n=3,115) accounted for an additional 18.1% of the 183-m haul seine catch. The ten most abundant taxa accounted for 88.5% of the total catch with this gear.

A total of 29 Selected Taxa were collected with the 183-m haul seine. Selected Taxa represented 24.3% (n=8,410) of the total catch with this gear (Table AP02-05). The most abundant Selected Taxa collected in haul seine samples were *L. xanthurus* (n=3,149) and *M. cephalus* (n=1,880), accounting for 14.5% of the total 183-m haul seine catch. Other common Selected Taxa collected with this gear included *M. undulatus* (n=1,335) and *Mugil curema* (n=455).

6.1-m Bay Otter Trawls. A total of 18,667 fishes and selected invertebrates were collected in 144 6.1-m bay otter trawl samples, accounting for 12.8% of the total 2002 SRS collection (Table AP02-06). The mean density estimate for 6.1-m bay otter trawl samples was 8.8 animals/100 m^2. *Anchoa mitchilli* (n=3,518) was the most abundant species in collections with this gear, accounting for 18.7% of the total 6.1-m bay otter trawl catch. The 11 most dominant taxa represented 83.8% of the total catch with this gear.

A total of 7,674 animals designated as Selected Taxa were collected in 6.1-m bay otter trawl samples (Table AP02-07). Selected Taxa (n=19) made up 40.9% of the total catch with this gear. The most abundant Selected Taxa included *L. xanthurus* (n=2,973), *M. undulatus* (n=2,206), *C. arenarius* (n=1,141), and *Farfantepenaeus aztecus* (n=376).

River Sampling

21.3-m River Seines. There were 36,124 fishes and selected invertebrates collected in 168 21.3-m river seine samples, accounting for 24.6% of the total SRS catch for 2002 (Table AP02-08). The mean density estimate for river seine collections was 316 animals/100 m^2. The most abundant taxon was *A. mitchilli* (n=19,031), accounting for 52.7% of the total catch with this gear in the rivers. The 10 most abundant taxa accounted for 91.1% of the total 21.3-m river seine collection.

Selected Taxa (n=18) collected from 21.3-m river seine samples made up 13.3% (n=4,789) of the total catch with this gear in the rivers (Table AP02-09). *Leiostomus xanthurus* (n=4,281), *C. sapidus* (n=255), and *M. cephalus* (n=103) were among the most abundant Selected Taxa, making up 96.9% of the Selected Taxa collected in river seine samples.

6.1-m River Otter Trawls. A total of 8,269 fishes and selected invertebrates were collected in 84 river otter trawl samples, accounting for 5.7% of the total 2002 SRS collection (Table AP02-10). Mean density estimate for river otter trawls was 13 animals/100 m^2. The ten most dominant taxa represented 90.3% of the total catch with this gear in the rivers. *Anchoa mitchilli* (n=1,943), the most abundant species, accounted for 23.4% of the total 6.1-m river otter trawl catch.

There were 4,180 animals designated as Selected Taxa (n=17 taxa) collected in river otter trawl samples, representing 50.3% of the total trawl catch (Table AP02-11). The most abundant Selected Taxa were *M. undulatus* (n=1,590) and *C. arenarius* (n=1,543). These species accounted for 75.0% of the Selected Taxa collected in the river otter trawl samples.

References

Florida Department of Environmental Protection. 1998. Apalachicola National Estuarine Research Reserve Management Plan. Adopted July 23, 1998. 192 pp.

Livingston, R. J. 1983. Resource Atlas of the Apalachicola Estuary. 64 pp.

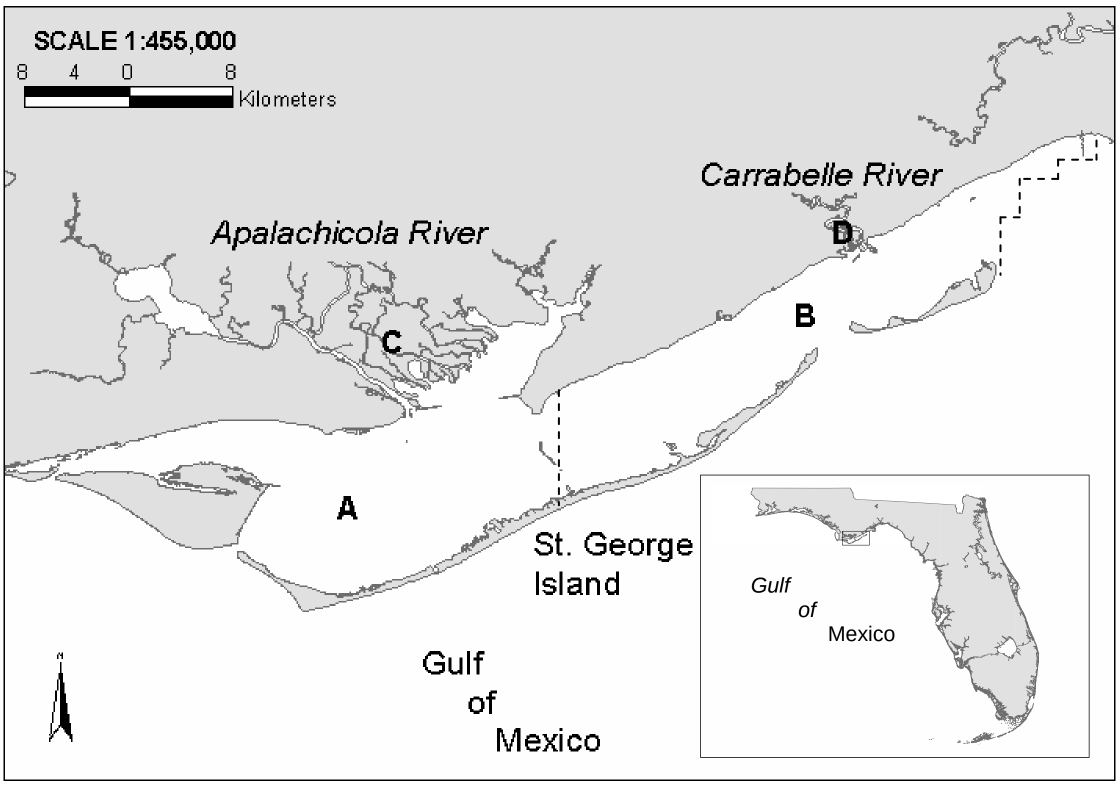

Figure AP02-01. Apalachicola Field Lab sampling universe. Zones are labeled A–D.

Table AP02-01. Summary of catch and effort data for Apalachicola Bay stratified-random sampling, 2002.

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	31,740	120	.	.	16,936	108	13,236	72	61,912	300
B	17,145	120	.	.	17,716	108	5,431	72	40,292	300
C	.	.	17,576	96	.	.	5,094	48	22,670	144
D	.	.	18,548	72	.	.	3,175	36	21,723	108
Totals	**48,885**	**240**	**36,124**	**168**	**34,652**	**216**	**26,936**	**228**	**146,597**	**852**

Table AP02-02. Catch statistics for 10 dominant taxa collected in 240 21.3-m bay seine samples during Apalachicola Bay stratified-random sampling, 2002. 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	15,509	31.7	40.0	46.16	16.28	546.49	3,271.43	23	0.07	9	168
Lagodon rhomboides	7,905	16.2	59.6	23.53	6.62	436.09	1,211.43	30	0.21	9	157
Brevoortia spp.	5,156	10.5	16.7	15.35	6.76	682.58	1,280.00	26	0.06	19	122
Anchoa mitchilli	3,562	7.3	26.3	10.60	2.76	403.78	325.71	32	0.13	17	74
Mugil cephalus	3,507	7.2	17.5	10.44	5.14	762.48	1,165.71	29	0.22	16	300
Menidia spp.	1,678	3.4	32.9	4.99	1.99	616.88	444.29	47	0.33	20	96
Orthopristis chrysoptera	1,396	2.9	21.7	4.15	1.14	426.16	148.57	43	0.44	17	182
Bairdiella chrysoura	1,371	2.8	20.0	4.08	1.40	532.31	250.71	38	0.62	10	188
Farfantepenaeus spp.	1,282	2.6	25.8	3.82	0.95	384.08	126.43	10	0.06	4	16
Eucinostomus spp.	1,032	2.1	32.5	3.07	0.55	275.92	61.43	25	0.22	8	53
Subtotal	42,398	86.7	.	.	.	.	.	.	.	4	300
Totals	**48,885**	**100.0**	**.**	**145.50**	**23.54**	**250.65**	**4,501.43**	**.**	**.**	**3**	**600**

Table AP02-03. Catch statistics for Selected Taxa collected in 240 21.3-m bay seine samples during Apalachicola Bay stratified-random sampling, 2002. 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	15,509	31.7	40.0	46.16	16.28	546.49	3,271.43	23	0.07	9	168
Mugil cephalus	3,507	7.2	17.5	10.44	5.14	762.48	1,165.71	29	0.22	16	300
Micropogonias undulatus	473	1.0	9.6	1.41	0.58	635.11	111.43	23	0.73	8	184
Sciaenops ocellatus	460	0.9	8.8	1.37	0.55	619.89	81.43	24	1.77	9	480
Cynoscion arenarius	447	0.9	10.8	1.33	0.50	584.48	87.14	26	0.51	9	75
Menticirrhus americanus	332	0.7	12.1	0.99	0.56	880.17	132.14	35	0.83	15	118
Litopenaeus setiferus	216	0.4	11.3	0.64	0.22	532.12	35.71	13	0.48	3	37
Mugil curema	138	0.3	7.1	0.41	0.18	668.44	34.29	32	1.58	18	136
Cynoscion nebulosus	136	0.3	17.9	0.40	0.09	325.86	10.71	40	2.07	15	162
Farfantepenaeus duorarum	126	0.3	14.6	0.38	0.08	347.15	12.14	18	0.32	9	31
Lutjanus synagris	115	0.2	9.6	0.34	0.12	526.63	19.29	28	0.96	14	62
Callinectes sapidus	100	0.2	18.3	0.30	0.06	288.07	7.14	21	2.87	3	185
Lutjanus griseus	40	0.1	4.2	0.12	0.05	627.41	8.57	29	2.51	12	76
Paralichthys albigutta	37	0.1	7.9	0.11	0.03	462.10	4.29	59	10.16	16	265
Farfantepenaeus aztecus	31	0.1	3.8	0.09	0.04	611.28	6.43	18	0.57	11	25
Menticirrhus saxatilis	23	0.0	1.7	0.07	0.04	882.11	7.14	35	5.82	12	109

Table AP02-03. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Archosargus probatocephalus	11	0.0	2.9	0.03	0.01	606.96	1.43	100	41.47	10	345
Menippe spp.	8	0.0	2.9	0.02	0.01	605.41	1.43	16	3.00	7	33
Mycteroperca microlepis	8	0.0	2.9	0.02	0.01	605.41	1.43	139	14.00	75	184
Trachinotus carolinus	8	0.0	0.8	0.02	0.02	1,223.21	4.29	46	6.03	21	70
Paralichthys squamilentus	8	0.0	0.8	0.02	0.02	1,368.50	5.00	27	3.31	20	49
Paralichthys lethostigma	7	0.0	2.5	0.02	0.01	657.74	1.43	59	27.69	16	224
Menticirrhus littoralis	6	0.0	2.1	0.02	0.01	724.93	1.43	74	35.52	17	249
Elops saurus	1	0.0	0.4	0.00	0.00	1,549.19	0.71	82	.	82	82
Pomatomus saltatrix	1	0.0	0.4	0.00	0.00	1,549.19	0.71	23	.	23	23
Totals	**21,748**	**44.5**	**81.7**	**64.73**	**20.73**	**496.10**	**4,437.14**	**.**	**.**	**3**	**480**

Table AP02-04. Catch statistics for 10 dominant taxa collected in 216 183-m haul seine samples during Apalachicola Bay stratified-random sampling, 2002. 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	10,639	30.7	77.8	49.25	4.94	147.36	552.00	101	0.27	31	212
Harengula jaguana	6,591	19.0	22.7	30.51	14.01	674.62	2,520.00	87	0.16	47	143
Leiostomus xanthurus	3,149	9.1	58.3	14.58	2.83	284.95	395.00	129	0.62	34	237
Bairdiella chrysoura	3,115	9.0	31.0	14.42	4.76	485.54	789.00	129	0.34	40	258
Mugil cephalus	1,880	5.4	67.6	8.70	2.36	398.09	489.00	211	2.01	72	455
Brevoortia spp.	1,776	5.1	8.8	8.22	5.21	930.77	827.00	81	0.38	40	168
Micropogonias undulatus	1,335	3.9	15.7	6.18	2.53	602.44	381.00	167	1.10	61	268
Dasyatis sabina	815	2.4	65.3	3.77	0.45	173.54	48.00	233	1.47	92	400
Orthopristis chrysoptera	783	2.3	28.7	3.63	0.90	365.51	149.00	117	1.32	47	250
Chloroscombrus chrysurus	551	1.6	0.9	2.55	2.55	1,467.02	550.00	45	0.21	40	139
Subtotal	30,634	88.5	.	.	.	.	.	.	.	31	455
Totals	**34,652**	**100.0**	**.**	**160.43**	**20.01**	**183.33**	**2,612.00**	**.**	**.**	**10**	**815**

Table AP02-05. Catch statistics for Selected Taxa collected in 216 183-m haul seine samples during Apalachicola Bay stratified-random sampling, 2002. 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
Leiostomus xanthurus	3,149	9.1	58.3	14.58	2.83	284.95	395.00	129	0.62	34	237
Mugil cephalus	1,880	5.4	67.6	8.70	2.36	398.09	489.00	211	2.01	72	455
Micropogonias undulatus	1,335	3.9	15.7	6.18	2.53	602.44	381.00	167	1.10	61	268
Mugil curema	455	1.3	30.1	2.11	0.58	403.71	98.00	154	1.93	55	360
Sciaenops ocellatus	258	0.7	36.1	1.19	0.15	188.15	12.00	356	7.02	60	615
Paralichthys albigutta	191	0.6	32.9	0.88	0.14	239.48	19.00	139	4.77	45	365
Trachinotus falcatus	144	0.4	6.9	0.67	0.31	675.79	55.00	50	0.92	29	116
Cynoscion nebulosus	139	0.4	26.4	0.64	0.13	299.67	19.00	217	8.85	66	593
Archosargus probatocephalus	131	0.4	24.5	0.61	0.12	279.45	17.00	299	5.51	61	449
Callinectes sapidus	117	0.3	17.6	0.54	0.12	336.81	14.00	97	4.15	14	277
Litopenaeus setiferus	112	0.3	6.5	0.52	0.39	1,096.81	83.00	21	0.41	12	40
Elops saurus	89	0.3	13.4	0.41	0.12	412.25	17.00	281	5.42	172	450
Menticirrhus americanus	78	0.2	10.6	0.36	0.09	360.24	10.00	132	4.99	51	257
Mycteroperca microlepis	75	0.2	8.8	0.35	0.13	543.24	23.00	177	5.44	47	380
Pomatomus saltatrix	71	0.2	6.0	0.33	0.18	817.29	37.00	114	1.89	80	189
Paralichthys lethostigma	54	0.2	12.0	0.25	0.06	334.66	6.00	179	11.52	50	405

Table AP02-05. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Trachinotus carolinus	46	0.1	6.0	0.21	0.11	774.03	23.00	78	5.00	36	251
Farfantepenaeus duorarum	22	0.1	5.1	0.10	0.05	720.43	10.00	26	1.55	15	45
Scomberomorus maculatus	18	0.1	2.8	0.08	0.04	778.55	7.00	195	26.37	72	460
Menticirrhus littoralis	12	0.0	3.2	0.06	0.03	708.75	5.00	154	20.26	85	290
Pogonias cromis	11	0.0	5.1	0.05	0.01	432.70	1.00	223	26.20	131	370
Lutjanus synagris	7	0.0	1.9	0.03	0.02	911.81	4.00	74	6.02	44	94
Lutjanus griseus	6	0.0	2.8	0.03	0.01	592.98	1.00	68	10.54	35	106
Paralichthys squamilentus	3	0.0	1.4	0.01	0.01	844.57	1.00	102	26.96	71	156
Menippe spp.	2	0.0	0.5	0.01	0.01	1,469.69	2.00	27	1.00	26	28
Menticirrhus saxatilis	2	0.0	0.5	0.01	0.01	1,469.69	2.00	110	0.00	110	110
Farfantepenaeus aztecus	1	0.0	0.5	0.00	0.00	1,469.69	1.00	22	.	22	22
Megalops atlanticus	1	0.0	0.5	0.00	0.00	1,469.69	1.00	310	.	310	310
Rachycentron canadum	1	0.0	0.5	0.00	0.00	1,469.69	1.00	197	.	197	197
Totals	**8,410**	**24.3**	**94.4**	**38.94**	**5.07**	**191.40**	**608.00**	**.**	**.**	**12**	**615**

Table AP02-06. Catch statistics for 11 dominant taxa collected in 144 bay 6.1-m otter trawl samples during Apalachicola Bay stratified-random sampling, 2002. 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	3,518	18.7	32.6	1.65	0.63	459.10	78.93	46	0.43	11	217
Leiostomus xanthurus	2,973	15.8	56.9	1.40	0.65	558.12	90.46	38	0.66	8	187
Micropogonias undulatus	2,206	11.7	40.3	1.03	0.24	283.39	18.08	35	0.57	8	199
Stellifer lanceolatus	1,869	10.0	1.4	0.88	0.87	1,198.06	125.88	17	0.07	15	50
Lagodon rhomboides	1,323	7.0	41.7	0.62	0.31	592.25	35.75	55	1.02	14	146
Cynoscion arenarius	1,141	6.1	28.5	0.53	0.20	439.20	21.72	35	0.54	10	171
Etropus crossotus	785	4.2	50.7	0.37	0.06	198.39	5.33	70	0.61	22	118
Arius felis	696	3.7	37.5	0.33	0.07	275.77	6.95	85	1.40	28	305
Orthopristis chrysoptera	483	2.6	30.6	0.23	0.08	423.51	10.39	86	1.38	19	180
Bairdiella chrysoura	376	2.0	20.8	0.18	0.06	382.56	6.27	84	1.55	12	154
Farfantepenaeus aztecus	376	2.0	26.4	0.18	0.04	296.18	3.04	25	0.27	14	44
Subtotal	15,746	84.2	.	.	.	.	.	.	.	8	305
Totals	**18,667**	**100.0**	**.**	**8.75**	**1.60**	**218.79**	**151.17**	**.**	**.**	**4**	**740**

Table AP02-07. Catch statistics for Selected Taxa collected in 144 bay 6.1-m otter trawl samples during Apalachicola Bay stratified-random sampling, 2002. 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	2,973	15.8	56.9	1.40	0.65	558.12	90.46	38	0.66	8	187
Micropogonias undulatus	2,206	11.7	40.3	1.03	0.24	283.39	18.08	35	0.57	8	199
Cynoscion arenarius	1,141	6.1	28.5	0.53	0.20	439.20	21.72	35	0.54	10	171
Farfantepenaeus aztecus	376	2.0	26.4	0.18	0.04	296.18	3.04	25	0.27	14	44
Litopenaeus setiferus	239	1.3	27.8	0.11	0.04	398.78	4.79	23	0.55	4	44
Farfantepenaeus duorarum	230	1.2	38.9	0.11	0.02	269.60	2.63	26	0.46	13	44
Menticirrhus americanus	160	0.9	19.4	0.07	0.03	453.21	3.44	47	2.56	13	265
Callinectes sapidus	140	0.7	29.2	0.07	0.01	270.52	1.48	51	3.22	11	200
Paralichthys albigutta	65	0.3	21.5	0.03	0.01	272.90	0.61	138	7.11	60	340
Lutjanus synagris	45	0.2	16.0	0.02	0.01	287.32	0.34	50	4.15	13	110
Menticirrhus littoralis	35	0.2	1.4	0.02	0.02	1,165.98	2.29	26	1.17	13	46
Menippe spp.	27	0.1	9.0	0.01	0.01	476.06	0.61	23	4.09	5	90
Cynoscion nebulosus	13	0.1	2.8	0.01	0.00	804.58	0.54	79	16.00	16	223
Paralichthys lethostigma	11	0.1	6.3	0.01	0.00	411.94	0.13	204	17.66	120	340
Cynoscion nothus	5	0.0	2.1	0.00	0.00	715.51	0.13	25	3.22	17	35
Mugil cephalus	3	0.0	1.4	0.00	0.00	891.92	0.13	23	0.58	22	24
Mycteroperca microlepis	2	0.0	1.4	0.00	0.00	845.56	0.07	35	18.50	16	53
Archosargus probatocephalus	2	0.0	0.7	0.00	0.00	1,200.00	0.13	353	27.50	325	380
Menticirrhus saxatilis	1	0.0	0.7	0.00	0.00	1,200.00	0.07	85	.	85	85
Totals	**7,674**	**41.1**	**89.6**	**3.60**	**0.76**	**253.43**	**90.60**	**.**	**.**	**4**	**380**

Table AP02-08. Catch statistics for 10 dominant taxa collected in 168 21.3-m river seine samples during Apalachicola Bay stratified-random sampling, 2002. 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	19,031	52.7	25.0	166.59	86.14	670.24	11,105.88	32	0.07	15	65
Menidia spp.	5,188	14.4	51.2	45.41	8.10	231.13	710.29	45	0.16	18	97
Leiostomus xanthurus	4,281	11.8	23.8	37.47	18.47	638.70	2,480.88	20	0.14	11	103
Eucinostomus spp.	1,289	3.6	33.9	11.28	2.60	299.07	313.24	25	0.23	10	44
Bairdiella chrysoura	859	2.4	15.5	7.52	2.72	468.18	351.47	55	0.75	12	145
Brevoortia spp.	702	1.9	11.3	6.14	3.30	696.94	470.59	23	0.09	20	32
Notropis petersoni	504	1.4	19.6	4.41	1.09	319.45	101.47	38	0.35	16	57
Lucania parva	399	1.1	27.4	3.49	0.83	308.68	82.35	22	0.22	10	38
Micropterus salmoides	351	1.0	26.8	3.07	0.75	315.75	92.65	55	2.54	16	311
Lagodon rhomboides	293	0.8	33.3	2.56	0.63	318.60	77.94	49	1.23	12	135
Subtotal	32,897	91.1	.	.	.	.	.	.	.	10	311
Totals	**36,124**	**100.0**	**.**	**316.21**	**89.09**	**365.17**	**11,180.88**	**.**	**.**	**4**	**520**

Table AP02-09. Catch statistics for Selected Taxa collected in 168 21.3-m river seine samples during Apalachicola Bay stratified-random sampling, 2002. 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	4,281	11.8	23.8	37.47	18.47	638.70	2,480.88	20	0.14	11	103
Callinectes sapidus	255	0.7	44.6	2.23	0.34	195.99	20.59	33	1.85	4	138
Mugil cephalus	103	0.3	14.9	0.90	0.28	407.79	38.24	31	2.27	21	146
Sciaenops ocellatus	43	0.1	7.7	0.38	0.17	593.98	22.06	57	9.32	14	308
Lutjanus griseus	22	0.1	8.9	0.19	0.05	369.59	5.88	42	3.61	14	70
Cynoscion nebulosus	20	0.1	7.1	0.18	0.05	398.68	4.41	59	5.44	20	110
Micropogonias undulatus	15	0.0	2.4	0.13	0.08	753.87	8.82	34	7.50	9	101
Archosargus probatocephalus	10	0.0	4.2	0.09	0.03	510.24	2.94	96	29.14	27	273
Paralichthys lethostigma	10	0.0	5.4	0.09	0.03	439.03	2.94	163	19.72	18	230
Farfantepenaeus duorarum	9	0.0	2.4	0.08	0.04	715.24	5.88	18	0.72	15	21
Litopenaeus setiferus	8	0.0	4.2	0.07	0.03	504.00	2.94	8	1.19	4	14
Farfantepenaeus aztecus	4	0.0	1.8	0.04	0.02	789.75	2.94	19	0.87	16	20
Cynoscion arenarius	3	0.0	1.2	0.03	0.02	963.78	2.94	33	4.51	28	42
Mugil curema	2	0.0	1.2	0.02	0.01	913.77	1.47	89	31.50	57	120
Menippe spp.	1	0.0	0.6	0.01	0.01	1,296.15	1.47	6	.	6	6
Trachinotus carolinus	1	0.0	0.6	0.01	0.01	1,296.15	1.47	51	.	51	51
Scomberomorus maculatus	1	0.0	0.6	0.01	0.01	1,296.15	1.47	44	.	44	44
Paralichthys albigutta	1	0.0	0.6	0.01	0.01	1,296.15	1.47	17	.	17	17
Totals	**4,789**	**13.3**	**71.4**	**41.92**	**18.49**	**571.59**	**2,483.82**	**.**	**.**	**4**	**308**

Table AP02-10. Catch statistics for 10 dominant taxa collected in 84 river 6.1-m otter trawl samples during Apalachicola Bay stratified-random sampling, 2002. 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	1,943	23.4	50.0	3.12	0.95	278.79	55.72	33	0.20	17	98
Micropogonias undulatus	1,590	19.2	39.3	2.55	1.30	467.91	104.29	34	0.44	9	191
Cynoscion arenarius	1,543	18.6	38.1	2.49	0.73	270.95	30.76	42	0.46	13	245
Trinectes maculatus	1,016	12.2	41.7	1.63	0.72	405.04	43.31	24	0.52	6	132
Leiostomus xanthurus	477	5.7	34.5	0.77	0.35	420.13	26.44	54	1.71	10	212
Bairdiella chrysoura	302	3.6	19.0	0.49	0.26	489.50	16.46	79	1.24	51	153
Callinectes sapidus	173	2.1	44.0	0.27	0.07	227.74	3.78	58	3.56	2	180
Symphurus plagiusa	164	2.0	23.8	0.26	0.09	317.09	5.40	50	2.31	14	160
Litopenaeus setiferus	162	2.0	22.6	0.25	0.08	306.26	4.72	13	0.57	3	45
Farfantepenaeus spp.	126	1.5	17.9	0.19	0.08	359.14	4.32	10	0.27	4	15
Subtotal	7,496	90.8	.	.	.	.	.	.	.	2	245
Totals	**8,269**	**100.0**	**.**	**13.24**	**2.12**	**146.75**	**109.15**	**.**	**.**	**2**	**673**

Table AP02-11. Catch statistics for Selected Taxa collected in 84 river 6.1-m otter trawl samples during Apalachicola Bay stratified-random sampling, 2002. 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	1,590	19.2	39.3	2.55	1.30	467.91	104.29	34	0.44	9	191
Cynoscion arenarius	1,543	18.6	38.1	2.49	0.73	270.95	30.76	42	0.46	13	245
Leiostomus xanthurus	477	5.7	34.5	0.77	0.35	420.13	26.44	54	1.71	10	212
Callinectes sapidus	173	2.1	44.0	0.27	0.07	227.74	3.78	58	3.56	2	180
Litopenaeus setiferus	162	2.0	22.6	0.25	0.08	306.26	4.72	13	0.57	3	45
Farfantepenaeus duorarum	111	1.3	20.2	0.18	0.08	443.23	6.21	26	0.64	14	41
Menticirrhus americanus	43	0.5	19.0	0.07	0.02	332.07	1.62	42	6.37	16	223
Farfantepenaeus aztecus	26	0.3	4.8	0.04	0.03	630.34	2.29	25	1.37	16	45
Paralichthys lethostigma	24	0.3	15.5	0.04	0.01	274.74	0.54	140	13.64	35	247
Cynoscion nebulosus	10	0.1	9.5	0.02	0.01	354.82	0.40	71	10.66	33	131
Menippe spp.	6	0.1	2.4	0.01	0.01	798.64	0.84	34	7.22	15	61
Archosargus probatocephalus	6	0.1	6.0	0.01	0.00	422.84	0.27	228	30.92	143	370
Sciaenops ocellatus	4	0.0	2.4	0.01	0.01	721.95	0.40	24	11.93	11	60
Lutjanus griseus	2	0.0	1.2	0.00	0.00	916.52	0.27	83	32.00	51	115
Elops saurus	1	0.0	1.2	0.00	0.00	916.52	0.13	37	.	37	37
Paralichthys albigutta	1	0.0	1.2	0.00	0.00	916.52	0.13	42	.	42	42
Lutjanus synagris	1	0.0	1.2	0.00	0.00	916.52	0.07	38	.	38	38
Totals	**4,180**	**50.6**	**76.2**	**6.70**	**1.62**	**221.61**	**106.72**	**.**	**.**	**2**	**370**

Appendix AP02-01. Monthly summary of species collected during Apalachicola Bay stratified-random sampling, 2002. 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=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=852
Adinia xenica	61	27	1	.	.	7	1	.	.	5	11	4	117
Aetobatis narinari	.	.	.	.	.	.	.	.	1	.	.	.	1
Alosa alabamae	.	1	.	.	.	.	.	.	.	.	.	.	1
Alosa chrysochloris	.	.	2	9	2	2	.	.	.	2	.	.	17
Aluterus schoepfi	.	.	.	.	.	1	.	.	.	.	.	.	1
Ameiurus catus	.	.	6	.	.	.	.	.	.	.	.	.	6
Amia calva	.	.	1	.	.	.	.	.	.	.	.	.	1
Anchoa hepsetus	.	.	1	5	558	133	20	32	10	2	3	1	765
Anchoa mitchilli	504	214	254	531	1,218	2,016	9,032	2,175	2,234	821	8,421	634	28,054
Ancylopsetta quadrocellata	3	3	2	1	5	5	.	1	1	.	1	2	24
Archosargus probatocephalus	4	6	10	25	16	26	15	15	9	12	18	4	160
Arius felis	5	1	117	55	30	212	173	235	327	197	47	15	1,414
Astroscopus y-graecum	1	1	1	.	.	.	1	.	.	.	.	.	4
Bagre marinus	.	.	1	1	5	4	26	38	27	1	.	.	103
Bairdiella chrysoura	150	75	21	520	878	951	798	303	573	644	861	249	6,023
Brevoortia spp.	3	2,186	2,147	1,053	480	48	84	1,640	28	2	2	23	7,696
Calamus arctifrons	.	.	.	.	.	.	.	.	4	6	.	.	10
Callinectes sapidus	66	94	63	40	108	54	87	26	20	40	90	97	785
Callinectes spp.	.	.	.	.	.	.	2	.	.	.	.	.	2
Caranx crysos	.	.	.	.	.	.	.	.	.	2	.	.	2
Caranx hippos	.	.	.	.	.	2	.	1	13	73	2	.	91
Carcharhinus leucas	.	.	.	.	1	.	.	.	.	.	.	.	1
Centropristis philadelphica	.	.	.	.	2	.	.	2	2	1	3	2	12
Centropristis striata	.	1	.	.	.	.	.	.	2	.	.	.	3

Appendix AP02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=852
Chaetodipterus faber	.	.	.	1	.	.	3	9	11	3	2	.	29
Chasmodes saburrae	.	.	.	4	2	3	11	2	7	4	1	.	34
Chilomycterus schoepfi	.	3	1	7	12	11	8	9	17	19	10	3	100
Chloroscombrus chrysurus	.	.	.	.	.	.	1	18	4	778	26	.	827
Citharichthys macrops	.	1	.	12	33	47	10	6	4	14	5	4	136
Citharichthys spilopterus	.	.	2	2	11	22	25	10	4	1	.	.	77
Cynoscion arenarius	10	3	.	15	677	393	755	767	348	96	67	3	3,134
Cynoscion nebulosus	7	3	8	6	37	32	38	57	43	29	31	27	318
Cynoscion nothus	.	.	.	.	.	.	.	.	.	3	2	.	5
Cyprinodon variegatus	1	5	7	1	3	6	.	.	.	.	.	1	24
Dasyatis sabina	13	39	151	72	84	90	166	82	73	84	49	21	924
Dasyatis say	.	.	.	16	3	15	10	5	9	5	1	.	64
Diplectrum bivittatum	.	.	.	161	.	.	3	2	11	2	1	.	180
Diplectrum formosum	.	.	.	.	.	2	2	.	.	1	.	.	5
Dormitator maculatus	.	.	.	.	.	.	.	.	.	.	1	.	1
Dorosoma cepedianum	.	.	.	1	5	.	8	.	.	.	1	.	15
Dorosoma petenense	.	.	.	.	.	.	1	.	.	.	2	.	3
Echeneis naucrates	.	.	.	.	1	.	2	.	.	.	.	.	3
Echeneis spp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Elops saurus	.	1	.	1	13	6	10	21	21	2	15	1	91
Enneacanthus gloriosus	.	.	1	.	.	12	2	.	2	.	.	1	18
Esox niger	1	1	.	1	.	.	.	.	.	.	.	1	4
Etropus crossotus	7	4	9	48	11	9	80	209	295	171	98	46	987
Etropus microstomus	.	.	.	.	.	2	2	.	.	.	1	.	5
Eucinostomus gula	2	.	.	.	3	.	14	58	73	51	99	6	306
Eucinostomus harengulus	22	.	.	.	.	.	81	111	121	85	106	40	566

Appendix AP02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=852
Eucinostomus spp.	.	.	.	.	.	66	346	675	362	239	630	157	2,475
Farfantepenaeus aztecus	.	1	2	23	227	94	33	15	20	23	.	.	438
Farfantepenaeus duorarum	13	49	70	35	73	37	52	42	31	38	40	18	498
Farfantepenaeus spp.	2	24	.	11	256	137	256	106	391	275	110	4	1,572
Fundulus chrysotus	.	2	.	1	.	.	.	.	.	.	1	.	4
Fundulus grandis	16	24	30	1	5	1	6	3	.	54	69	18	227
Fundulus jenkinsi	.	1	.	.	.	.	.	.	.	.	.	.	1
Fundulus majalis	1	7	157	5	57	46	13	.	.	.	11	148	445
Gambusia holbrooki	148	26	3	.	.	1	.	.	1	16	48	1	244
Gobionellus boleosoma	19	42	8	52	166	17	11	72	65	59	78	9	598
Gobionellus oceanicus	.	.	.	2	.	3	.	.	.	.	.	.	5
Gobiosoma bosc	4	9	2	3	82	24	19	3	4	15	61	9	235
Gobiosoma robustum	.	2	1	.	8	1	3	.	2	.	1	.	18
Gymnura micrura	.	.	.	22	2	.	1	4	.	2	.	.	31
Halichoeres bivittatus	.	.	.	.	2	.	2	.	.	.	.	.	4
Harengula jaguana	.	.	.	3,786	412	482	34	184	339	1,738	3	.	6,978
Hemicaranx amblyrhynchus	.	.	.	.	.	.	5	4	6	1	.	.	16
Heterandria formosa	.	4	1	.	1	.	.	.	.	.	2	.	8
Hippocampus erectus	.	.	.	.	1	1	.	1	3	.	2	1	9
Hippocampus zosterae	3	.	.	.	.	.	.	.	.	.	.	.	3
Hyporhamphus meeki	.	.	.	.	1	2	7	.	5	1	.	.	16
Hypsoblennius hentzi	.	.	.	.	.	.	.	.	.	.	.	1	1
Hypsoblennius ionthas	.	.	.	.	.	.	.	.	.	.	.	2	2
Ictalurus furcatus	.	1	.	.	.	.	.	.	.	.	.	.	1
Ictalurus punctatus	2	7	6	1	1	3	2	12	4	27	6	2	73
Labidesthes sicculus	.	1	12	.	.	.	8	.	.	.	.	17	38

Appendix AP02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=852
Lactophrys quadricornis	.	.	.	2	1	.	.	1	7	.	3	.	14
Lagodon rhomboides	127	2,706	1,705	3,512	2,019	1,833	1,330	2,201	1,948	1,671	916	253	20,221
Leiostomus xanthurus	2,077	15,815	2,581	1,848	787	1,085	617	549	263	604	144	19	26,389
Lepisosteus oculatus	.	.	.	.	.	3	.	.	1	.	.	.	4
Lepisosteus osseus	.	2	.	.	.	.	2	.	3	2	.	1	10
Lepomis gulosus	2	.	.	.	.	.	.	.	.	.	.	.	2
Lepomis macrochirus	2	5	14	17	15	25	8	8	16	12	11	8	141
Lepomis microlophus	16	2	20	14	3	8	.	6	25	27	29	.	150
Lepomis punctatus	15	2	5	6	2	6	1	4	26	12	15	2	96
Limulus polyphemus	.	.	5	.	1	.	.	.	2	.	1	.	9
Litopenaeus setiferus	5	6	9	29	1	88	94	59	220	60	120	46	737
Lucania parva	2	74	17	16	27	106	34	14	54	108	66	4	522
Lutjanus griseus	.	.	.	.	.	.	2	4	26	27	11	.	70
Lutjanus synagris	.	.	.	.	.	1	6	70	55	19	15	2	168
Megalops atlanticus	.	.	.	.	.	.	.	.	.	1	.	.	1
Membras martinica	.	.	.	205	3	52	5	2	8	1	7	2	285
Membras spp.	.	.	.	.	.	.	4	166	.	.	.	.	170
Menidia spp.	39	342	67	47	313	849	2,141	1,191	494	578	617	197	6,875
Menippe spp.	5	2	2	3	6	4	.	7	2	2	10	1	44
Menticirrhus americanus	.	6	1	28	73	51	49	67	70	222	44	2	613
Menticirrhus littoralis	.	1	.	4	35	2	2	2	1	.	1	5	53
Menticirrhus saxatilis	.	6	.	10	7	2	.	.	.	.	1	.	26
Microgobius gulosus	.	1	.	.	22	9	7	5	50	1	11	4	110
Microgobius thalassinus	1	.	5	15	3	5	4	3	23	13	10	.	82
Micropogonias undulatus	290	153	344	2,022	449	199	758	482	71	4	60	787	5,619
Micropterus salmoides	5	3	6	36	168	60	13	7	28	13	17	1	357

Appendix AP02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=852
Minytrema melanops	.	.	.	.	.	1	.	.	.	.	.	.	1
Monacanthus ciliatus	.	.	.	.	.	.	.	.	10	7	5	.	22
Monacanthus hispidus	.	.	.	.	3	14	16	3	12	12	10	1	71
Morone saxatilis	.	.	.	.	.	.	.	.	.	.	.	1	1
Morone saxatilis x chrysops	.	.	.	.	.	.	.	.	.	.	1	.	1
Moxostoma spp.	.	.	.	.	.	.	.	1	.	.	.	.	1
Mugil cephalus	422	2,028	1,252	238	126	86	78	73	71	135	245	739	5,493
Mugil curema	.	45	134	53	15	33	10	3	31	54	180	37	595
Mugil spp.	.	1	.	.	.	.	.	.	.	.	.	.	1
Mycteroperca microlepis	.	.	.	1	3	5	7	40	11	18	.	.	85
Myrophis punctatus	6	.	87	.	.	.	.	.	.	.	.	1	94
Narcine brasiliensis	.	.	.	.	.	.	.	1	.	.	.	.	1
Nicholsina usta	.	.	.	.	.	1	.	.	.	.	1	.	2
Notemigonus crysoleucas	1	.	.	1	4	71	.	4	26	.	.	.	107
Notropis chalybaeus	.	.	.	.	.	.	.	.	.	.	.	1	1
Notropis cummingsae	.	.	.	.	.	.	.	.	.	.	37	.	37
Notropis maculatus	.	3	.	6	.	40	1	.	8	.	.	.	58
Notropis petersoni	.	89	64	62	13	74	47	18	36	92	.	9	504
Notropis spp.	13	.	.	.	.	.	215	.	.	.	.	4	232
Notropis texanus	.	.	.	.	1	.	.	1	.	.	.	.	2
Ogcocephalus radiatus	.	.	.	1	.	1	1	.	.	4	3	1	11
Oligoplites saurus	.	.	1	5	1	3	5	11	23	27	6	.	82
Ophichthus gomesi	1	.	.	.	.	1	.	.	.	.	.	.	2
Ophidion welshi	.	.	.	1	.	.	.	.	.	.	.	.	1
Opisthonema oglinum	.	.	.	6	.	.	.	7	2	6	.	.	21
Opsanus beta	.	2	.	3	3	5	3	5	8	3	.	2	34

Appendix AP02-01. (Continued)

Species	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Totals
	Month												
	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=852
Orthopristis chrysoptera	.	1	.	62	733	482	303	238	344	380	88	39	2,670
Paraclinus marmoratus	.	.	.	.	.	.	.	1	.	.	.	.	1
Paralichthys albigutta	10	16	18	40	44	47	26	42	17	19	7	9	295
Paralichthys lethostigma	9	11	13	4	20	7	7	8	10	7	2	8	106
Paralichthys squamilentus	.	7	2	2	.	.	.	.	.	.	.	.	11
Peprilus alepidotus	.	.	4	.	.	.	1	.	.	3	1	1	10
Peprilus burti	.	8	4	22	1	.	5	.	.	1	.	.	41
Poecilia latipinna	.	5	.	.	.	.	.	.	.	.	1	3	9
Pogonias cromis	.	.	.	1	.	.	.	1	2	1	4	2	11
Pomatomus saltatrix	.	.	1	64	4	2	1	.	.	.	.	.	72
Pomoxis nigromaculatus	.	.	.	.	.	.	.	.	1	.	.	.	1
Porichthys plectrodon	.	.	.	3	6	7	6	4	.	.	.	.	26
Prionotus scitulus	12	6	2	1	3	7	15	16	5	27	8	13	115
Prionotus tribulus	11	12	11	12	3	7	5	9	37	7	12	26	152
Rachycentron canadum	.	.	.	.	.	.	.	.	1	.	.	.	1
Rhinoptera bonasus	.	.	5	.	5	8	.	1	.	.	.	.	19
Rhizoprionodon terraenovae	.	.	.	1	.	.	.	.	.	.	.	.	1
Sardinella aurita	.	.	.	3	.	.	.	29	.	.	.	.	32
Sciaenops ocellatus	12	36	26	29	24	32	10	22	27	247	43	257	765
Scomberomorus maculatus	.	.	.	8	.	.	1	2	.	8	.	.	19
Scorpaena brasiliensis	.	.	.	.	.	.	.	.	.	1	.	.	1
Selene vomer	.	.	.	.	.	.	3	.	1	1	1	.	6
Serraniculus pumilio	1	.	.	.	.	.	2	.	3	.	1	.	7
Serranus subligarius	.	.	.	.	.	.	2	2	3	.	2	1	10
Sphoeroides nephelus	2	1	2	1	4	2	8	4	12	7	9	1	53
Sphoeroides parvus	2	.	2	.	2	4	.	2	3	9	20	.	44

Appendix AP02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=71	E=852
Sphyraena barracuda	.	.	.	.	.	.	.	.	3	1	.	.	4
Sphyraena borealis	.	.	.	.	.	2	.	.	.	.	.	.	2
Sphyraena guachancho	.	.	.	.	.	.	.	.	.	1	1	.	2
Sphyrna tiburo	.	.	.	5	.	.	2	5	.	.	.	.	12
Stellifer lanceolatus	.	.	.	.	.	.	4	1,869	.	.	.	.	1,873
Stenotomus caprinus	.	.	.	.	2	2	.	1	.	.	.	.	5
Stomolophus meleagris	.	.	.	.	.	.	.	.	1	1	.	.	2
Strongylura marina	12	8	9	3	11	49	23	18	7	13	13	9	175
Strongylura notata	.	.	.	.	1	3	.	1	2	.	2	.	9
Strongylura spp.	.	.	.	5	18	10	.	.	3	.	.	.	36
Symphurus plagiusa	8	42	23	14	18	22	74	36	80	38	37	17	409
Syngnathus floridae	.	3	.	4	2	4	8	5	8	10	5	1	50
Syngnathus louisianae	1	2	1	.	2	5	10	2	11	5	3	2	44
Syngnathus scovelli	9	18	7	24	30	24	27	20	27	26	21	9	242
Synodus foetens	5	.	1	6	72	54	17	27	29	24	16	8	259
Trachinotus carolinus	.	.	.	.	.	2	36	9	6	1	.	1	55
Trachinotus falcatus	.	.	.	.	.	.	1	1	17	15	110	.	144
Trinectes maculatus	5	25	30	107	49	29	75	219	128	608	69	69	1,413
Urophycis floridana	5	12	23	5	.	.	.	.	.	.	.	.	45
Urophycis regia	1	18	1	.	.	.	.	.	.	.	.	.	20
Totals	**4,202**	**24,394**	**9,602**	**15,147**	**10,651**	**10,560**	**18,401**	**14,564**	**9,946**	**10,840**	**14,112**	**4,172**	**146,597**

Appendix AP02-02. Summary by gear, stratum, and zone of species collected during Apalachicola Bay stratified-random sampling, 2002. 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 F encompassed the lower Aplachicola (C) and Carrabelle (D) Rivers. 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	F	
	E=76	E=57	E=107	E=168	E=216	E=228	E=300	E=300	E=252	E=852
Adinia xenica	.	.	4	113	.	.	.	4	113	117
Aetobatis narinari	.	.	.	.	1	.	.	1	.	1
Alosa alabamae	.	.	.	.	1	.	1	.	.	1
Alosa chrysochloris	.	.	2	1	14	.	11	5	1	17
Aluterus schoepfi	.	.	.	.	.	1	.	1	.	1
Ameiurus catus	.	.	.	.	.	6	.	.	6	6
Amia calva	.	.	.	1	.	.	.	.	1	1
Anchoa hepsetus	601	61	30	58	1	14	663	40	62	765
Anchoa mitchilli	1,019	378	2,165	19,031	.	5,461	6,077	1,003	20,974	28,054
Ancylopsetta quadrocellata	.	.	.	.	5	19	13	11	.	24
Archosargus probatocephalus	6	3	2	10	131	8	67	77	16	160
Arius felis	65	155	145	.	331	718	1,114	278	22	1,414
Astroscopus y-graecum	1	1	.	.	.	2	1	3	.	4
Bagre marinus	.	1	2	.	67	33	96	3	4	103
Bairdiella chrysoura	1,088	123	160	859	3,115	678	1,949	2,913	1,161	6,023
Brevoortia spp.	39	3,984	1,133	702	1,776	62	6,648	301	747	7,696
Calamus arctifrons	1	.	.	.	6	3	.	10	.	10
Callinectes sapidus	11	27	62	255	117	313	294	63	428	785
Callinectes spp.	.	.	.	2	.	.	.	.	2	2
Caranx crysos	.	.	.	.	2	.	.	2	.	2
Caranx hippos	1	.	.	1	89	.	6	84	1	91
Carcharhinus leucas	.	.	.	.	1	.	1	.	.	1
Centropristis philadelphica	.	.	1	.	.	11	1	11	.	12
Centropristis striata	1	.	.	.	.	2	.	3	.	3
Chaetodipterus faber	1	.	4	1	1	22	11	17	1	29
Chasmodes saburrae	22	1	5	.	5	1	1	33	.	34
Chilomycterus schoepfi	17	4	4	.	49	26	26	74	.	100
Chloroscombrus chrysurus	2	1	1	.	551	272	53	773	1	827
Citharichthys macrops	1	1	5	.	44	85	87	42	7	136

Appendix AP02-02. (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	F	
	E=76	E=57	E=107	E=168	E=216	E=228	E=300	E=300	E=252	E=852
Citharichthys spilopterus	.	2	1	2	23	49	64	7	6	77
Cynoscion arenarius	126	193	128	3	.	2,684	1,556	32	1,546	3,134
Cynoscion nebulosus	100	6	30	20	139	23	146	142	30	318
Cynoscion nothus	.	.	.	.	.	5	3	2	.	5
Cyprinodon variegatus	.	.	2	4	18	.	12	8	4	24
Dasyatis sabina	8	7	22	.	815	72	576	339	9	924
Dasyatis say	.	2	.	.	59	3	15	48	1	64
Diplectrum bivittatum	114	.	.	.	3	63	170	10	.	180
Diplectrum formosum	.	1	.	.	1	3	.	4	1	5
Dormitator maculatus	.	.	.	1	.	.	.	.	1	1
Dorosoma cepedianum	.	.	.	.	15	.	15	.	.	15
Dorosoma petenense	.	.	.	1	2	.	.	2	1	3
Echeneis naucrates	.	.	.	.	3	.	2	1	.	3
Echeneis spp.	.	.	.	.	1	.	.	1	.	1
Elops saurus	1	.	.	.	89	1	61	29	1	91
Enneacanthus gloriosus	.	.	.	18	.	.	.	.	18	18
Esox niger	.	.	.	4	.	.	.	.	4	4
Etropus crossotus	.	4	2	.	177	804	715	253	19	987
Etropus microstomus	.	.	.	.	.	5	.	5	.	5
Eucinostomus gula	36	8	86	2	119	55	43	261	2	306
Eucinostomus harengulus	40	26	95	173	108	124	148	183	235	566
Eucinostomus spp.	593	109	330	1,289	2	152	394	701	1,380	2,475
Farfantepenaeus aztecus	6	4	21	4	1	402	349	59	30	438
Farfantepenaeus duorarum	72	16	38	9	22	341	248	130	120	498
Farfantepenaeus spp.	631	147	504	51	2	237	852	543	177	1,572
Fundulus chrysotus	.	.	.	4	.	.	.	.	4	4
Fundulus grandis	.	.	2	167	58	.	18	42	167	227
Fundulus jenkinsi	.	.	1	.	.	.	1	.	.	1
Fundulus majalis	.	.	12	174	259	.	64	207	174	445
Gambusia holbrooki	.	.	.	244	.	.	.	.	244	244
Gobionellus boleosoma	226	67	67	203	.	35	290	97	211	598
Gobionellus oceanicus	.	.	.	3	.	2	2	.	3	5
Gobiosoma bosc	106	6	15	100	.	8	122	5	108	235
Gobiosoma robustum	13	3	1	.	.	1	.	18	.	18
Gymnura micrura	.	.	2	.	25	4	1	30	.	31
Halichoeres bivittatus	4	.	.	.	.	.	2	2	.	4
Harengula jaguana	366	2	6	6	6,591	7	4,234	2,731	13	6,978

Appendix AP02-02. (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	F	
	E=76	E=57	E=107	E=168	E=216	E=228	E=300	E=300	E=252	E=852
Hemicaranx amblyrhynchus	6	.	1	4	3	2	3	9	4	16
Heterandria formosa	.	.	.	8	.	.	.	.	8	8
Hippocampus erectus	.	2	1	.	1	5	3	6	.	9
Hippocampus zosterae	3	.	.	.	.	.	.	3	.	3
Hyporhamphus meeki	1	.	1	.	14	.	1	15	.	16
Hypsoblennius hentzi	1	.	.	.	.	.	.	1	.	1
Hypsoblennius ionthas	.	2	.	.	.	.	2	.	.	2
Ictalurus furcatus	.	.	.	.	.	1	.	.	1	1
Ictalurus punctatus	.	.	.	.	.	73	.	.	73	73
Labidesthes sicculus	.	.	.	38	.	.	.	.	38	38
Lactophrys quadricornis	.	.	.	.	3	11	.	14	.	14
Lagodon rhomboides	6,780	381	744	293	10,639	1,384	6,755	13,112	354	20,221
Leiostomus xanthurus	1,304	1,672	12,533	4,281	3,149	3,450	12,096	9,535	4,758	26,389
Lepisosteus oculatus	.	.	.	4	.	.	.	.	4	4
Lepisosteus osseus	.	.	.	2	4	4	4	1	5	10
Lepomis gulosus	.	.	.	2	.	.	.	.	2	2
Lepomis macrochirus	.	.	.	141	.	.	.	.	141	141
Lepomis microlophus	.	.	.	149	.	1	.	.	150	150
Lepomis punctatus	.	.	.	94	.	2	.	.	96	96
Limulus polyphemus	.	.	1	.	8	.	.	9	.	9
Litopenaeus setiferus	26	65	125	8	112	401	523	44	170	737
Lucania parva	70	.	51	399	.	2	38	83	401	522
Lutjanus griseus	25	.	15	22	6	2	10	36	24	70
Lutjanus synagris	100	5	10	.	7	46	27	140	1	168
Megalops atlanticus	.	.	.	.	1	.	1	.	.	1
Membras martinica	7	13	217	48	.	.	231	6	48	285
Membras spp.	.	169	1	.	.	.	170	.	.	170
Menidia spp.	114	141	1,423	5,188	9	.	1,293	394	5,188	6,875
Menippe spp.	1	2	5	1	2	33	14	23	7	44
Menticirrhus americanus	1	14	317	.	78	203	298	272	43	613
Menticirrhus littoralis	.	4	2	.	12	35	39	14	.	53
Menticirrhus saxatilis	.	6	17	.	2	1	10	16	.	26
Microgobius gulosus	15	40	4	29	.	22	57	2	51	110
Microgobius thalassinus	11	9	2	.	.	60	67	11	4	82
Micropogonias undulatus	197	117	159	15	1,335	3,796	3,936	78	1,605	5,619
Micropterus salmoides	.	.	6	351	.	.	6	.	351	357
Minytrema melanops	.	.	.	1	.	.	.	.	1	1

Appendix AP02-02. (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	F	
	E=76	E=57	E=107	E=168	E=216	E=228	E=300	E=300	E=252	E=852
Monacanthus ciliatus	4	.	.	.	11	7	.	22	.	22
Monacanthus hispidus	19	1	3	3	10	35	12	55	4	71
Morone saxatilis	.	.	.	.	.	1	.	.	1	1
Morone saxatilis x chrysops	.	.	.	.	1	.	1	.	.	1
Moxostoma spp.	.	.	.	1	.	.	.	.	1	1
Mugil cephalus	88	264	3,155	103	1,880	3	4,691	699	103	5,493
Mugil curema	.	1	137	2	455	.	292	301	2	595
Mugil spp.	.	.	1	.	.	.	.	1	.	1
Mycteroperca microlepis	8	.	.	.	75	2	56	29	.	85
Myrophis punctatus	.	.	1	.	.	93	90	4	.	94
Narcine brasiliensis	.	.	.	.	1	.	.	1	.	1
Nicholsina usta	2	.	.	.	.	.	.	2	.	2
Notemigonus crysoleucas	.	.	.	107	.	.	.	.	107	107
Notropis chalybaeus	.	.	.	1	.	.	.	.	1	1
Notropis cummingsae	.	.	.	37	.	.	.	.	37	37
Notropis maculatus	.	.	.	58	.	.	.	.	58	58
Notropis petersoni	.	.	.	504	.	.	.	.	504	504
Notropis spp.	.	.	.	232	.	.	.	.	232	232
Notropis texanus	.	.	.	2	.	.	.	.	2	2
Ogcocephalus radiatus	.	.	.	.	5	6	2	8	1	11
Oligoplites saurus	4	6	31	16	24	1	18	47	17	82
Ophichthus gomesi	.	.	.	.	.	2	1	1	.	2
Ophidion welshi	.	.	.	.	1	.	.	1	.	1
Opisthonema oglinum	2	.	1	.	18	.	6	15	.	21
Opsanus beta	3	.	4	.	12	15	12	20	2	34
Orthopristis chrysoptera	1,306	31	59	6	783	485	558	2,104	8	2,670
Paraclinus marmoratus	.	.	.	.	.	1	.	1	.	1
Paralichthys albigutta	14	3	20	1	191	66	119	174	2	295
Paralichthys lethostigma	.	3	4	10	54	35	63	9	34	106
Paralichthys squamilentus	.	1	7	.	3	.	10	1	.	11
Peprilus alepidotus	.	.	.	.	4	6	5	5	.	10
Peprilus burti	.	.	.	.	11	30	25	15	1	41
Poecilia latipinna	.	.	.	9	.	.	.	.	9	9
Pogonias cromis	.	.	.	.	11	.	9	2	.	11
Pomatomus saltatrix	.	.	1	.	71	.	60	12	.	72
Pomoxis nigromaculatus	.	.	.	1	.	.	.	.	1	1
Porichthys plectrodon	.	3	1	.	.	22	21	2	3	26

Appendix AP02-02. (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	F	
	E=76	E=57	E=107	E=168	E=216	E=228	E=300	E=300	E=252	E=852
Prionotus scitulus	2	4	7	.	15	87	31	80	4	115
Prionotus tribulus	1	11	12	3	24	101	107	24	21	152
Rachycentron canadum	.	.	.	.	1	.	1	.	.	1
Rhinoptera bonasus	8	.	.	.	11	.	8	11	.	19
Rhizoprionodon terraenovae	.	.	.	.	1	.	.	1	.	1
Sardinella aurita	29	.	.	.	3	.	.	32	.	32
Sciaenops ocellatus	14	68	378	43	258	4	499	219	47	765
Scomberomorus maculatus	.	.	.	1	18	.	2	16	1	19
Scorpaena brasiliensis	.	.	.	.	1	.	.	1	.	1
Selene vomer	.	.	2	.	3	1	1	5	.	6
Serraniculus pumilio	.	.	.	.	.	7	2	3	2	7
Serranus subligarius	.	.	2	.	.	8	2	7	1	10
Sphoeroides nephelus	10	2	11	2	13	15	11	37	5	53
Sphoeroides parvus	4	4	21	2	5	8	11	28	5	44
Sphyraena barracuda	.	.	.	.	4	.	.	4	.	4
Sphyraena borealis	2	.	.	.	.	.	.	2	.	2
Sphyraena guachancho	1	.	1	.	.	.	.	2	.	2
Sphyrna tiburo	.	.	.	.	11	1	1	11	.	12
Stellifer lanceolatus	.	.	.	.	.	1,873	1,869	.	4	1,873
Stenotomus caprinus	.	.	.	.	.	5	.	5	.	5
Stomolophus meleagris	.	1	.	.	1	.	1	1	.	2
Strongylura marina	19	5	28	14	109	.	51	110	14	175
Strongylura notata	.	1	.	1	7	.	6	2	1	9
Strongylura spp.	3	1	3	29	.	.	4	3	29	36
Symphurus plagiusa	4	12	28	14	6	345	182	49	178	409
Syngnathus floridae	39	2	3	2	1	3	.	48	2	50
Syngnathus louisianae	14	.	1	.	.	29	11	32	1	44
Syngnathus scovelli	119	20	18	63	.	22	54	118	70	242
Synodus foetens	30	11	22	23	42	131	89	135	35	259
Trachinotus carolinus	.	.	8	1	46	.	3	51	1	55
Trachinotus falcatus	.	.	.	.	144	.	37	107	.	144
Trinectes maculatus	1	6	1	239	81	1,085	34	124	1,255	1,413
Urophycis floridana	2	.	3	.	1	39	26	16	3	45
Urophycis regia	4	1	3	.	1	11	11	9	.	20
Totals	**15,736**	**8,447**	**24,702**	**36,124**	**34,652**	**26,936**	**61,912**	**40,292**	**44,393**	**146,597**

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Southern Indian River Lagoon

The southern Indian River Lagoon (IRL) system is a narrow estuary, which extends from Vero Beach south to Jupiter Inlet and has an average approximate depth of 1.5 m deep with the maximum depths occurring dredged channels and harbors. The Intra-Coastal Waterway runs the entire length of the IRL. Riverine systems that feed into the southern Indian River Lagoon include the St. Lucie and Loxahatchee Rivers. This lagoon system also has three ocean inlets, Ft. Pierce, St. Lucie, and Jupiter. This area has also been referred to as the Tequesta region (Gilmore 1977).

The sampling universe for the southern IRL is divided into three geographic zones, Zones I, J, and T (Figure TQ02-01). Zone I is an estuarine zone that stretches from Vero Beach south to Ankona. Zone J is another estuarine zone that extends from Ankona south to just north of Jupiter Inlet. Zone T is the only riverine zone, which encompasses the St. Lucie River.

The FIM program has been conducting monthly sampling in the southern Indian River Lagoon system since January 1997. Sampling sites were randomly selected, regardless of habitat type. Four samples per month were collected in both Zones I and J. In April 1998, the FIM program expanded sampling to include the St. Lucie River (8 samples/month; Zone T) because of an increase in the incidence of lesioned fish in this system. All sampling methods were the same as those described in the Methods section of this report.

Stratified-Random Sampling

183-m Haul seines. A total of 23,371 fishes and selected invertebrates were collected in 192 samples, representing 102 taxa (Table TQ02-01, Appendices TQ02-01 and -02). Samples from Zones I and J (n=48 hauls per zone) contained 9,978 and 10,359 individuals, respectively. In Zone T, 3,034 individuals were collected from 96 samples. Monthly catch totals (all species) ranged from 736 to 4,398 specimens, with a peak catch in the month of August. The lowest monthly catch total was recorded in February.

The ten dominant taxa (n=18,507) accounted for 79.2% of the total number of animals collected in the 183-m haul seines during monthly stratified-random sampling in 2002 (Table TQ02-02). *Lagodon rhomboides* (n=8,871) was the most abundant species collected, accounting for 38.0% of the total catch and occurring in 43.2% of the samples. Other abundant species included *Diapterus auratus* (n=4,429), *Mugil curema* (n=1,163), and *Archosargus probatocephalus* (n=816).

Thirty Selected Taxa (n=4,424) accounted for 18.9% of the overall 183-m haul seine catch (Table TQ02-03). Four species, *M. curema* (n=1,163), *A. probatocephalus* (n=816), *M. cephalus* (n=606), and *C. undecimalis* (n=566), accounted for 71.3% of the Selected Taxa collected. All four of these species occurred in >50% of the hauls. Other abundant Selected Taxa in the 183-m haul seine samples included *Elops saurus* (n=273), *Micropogonias undulatus* (n=263), *Lutjanus synagris* (n=165), and *Lutjanus griseus* (n=146).

There were 5 species new to SRS collections in 2002. These species were *Aulostomus maculatus* (trumpetfish), *Diodon holocanthus* (ballonfish), *Epinephelus morio* (red grouper), *Menippe* spp. (stonecrab), and *Rhinobatos lentiginosus* (guitarfish).

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Gilmore, R. G. 1977. Fishes of the Indian River lagoon and adjacent waters, Florida. Bulletin Florida State Museum, Biological Sciences, 22(3):101-148.

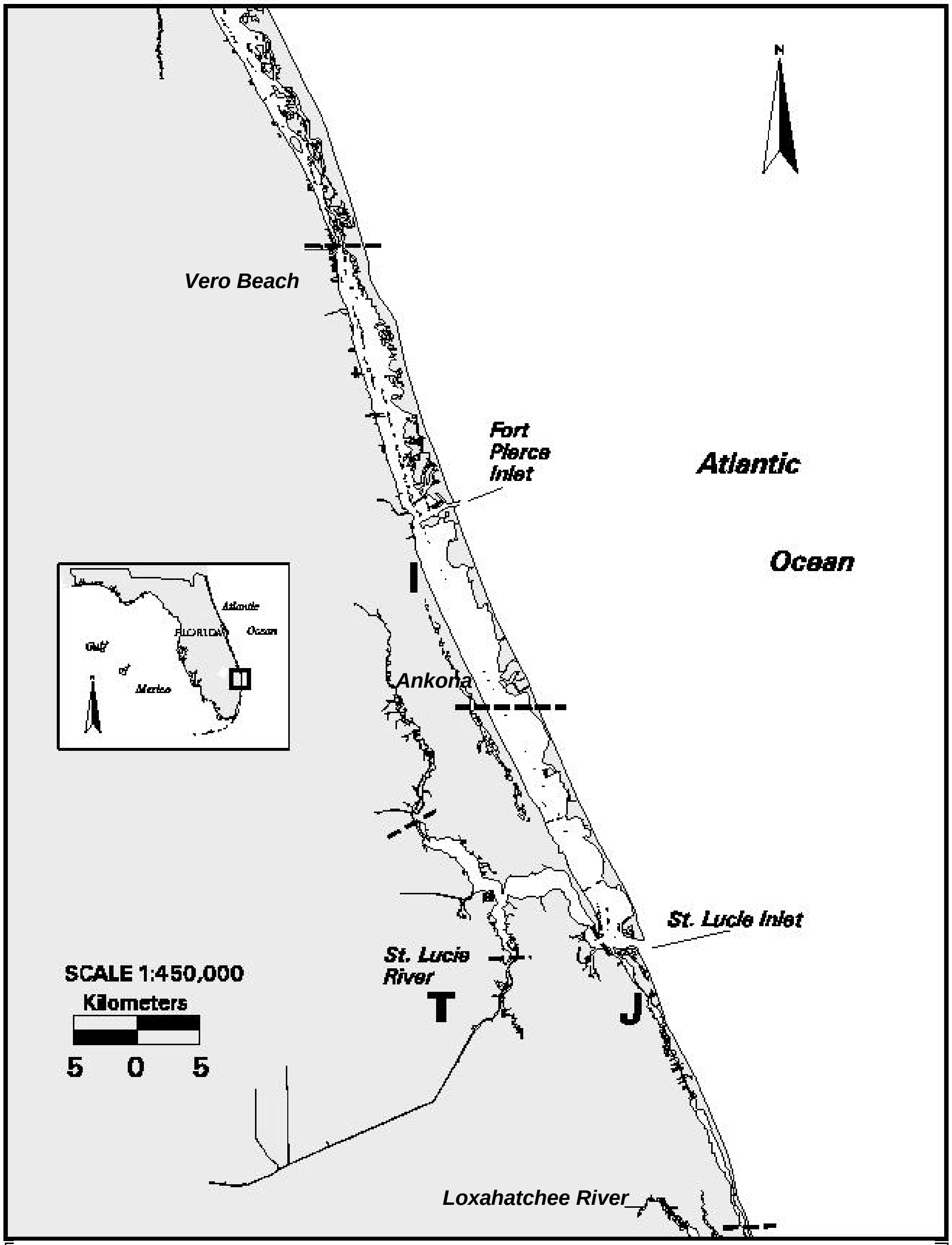

Figure TQ02-01. Map of southern Indian River Lagoon sampling area. Zones are I, J, and T.

Table TQ02-01. Summary of catch and effort data for southern Indian River Lagoon stratified-random sampling, 2002.

Zone	183-m river seine	
	Animals	Hauls
I	9,978	48
J	10,359	48
T	3,034	96
Totals	**23,371**	**192**

TQ02-02. Catch statistics for 10 dominant taxa collected in 192 183-m haul seine samples during Tequesta stratified-random sampling, 2002. 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	8,871	38.0	43.2	46.20	10.85	325.40	1,316.00	96	0.37	39	198
Diapterus auratus	4,429	19.0	70.8	23.07	5.82	349.79	987.00	147	0.64	37	315
Mugil curema	1,163	5.0	66.1	6.06	0.92	210.29	80.00	182	1.60	60	347
Archosargus probatocephalus	816	3.5	72.9	4.25	0.46	149.22	38.00	255	2.25	41	414
Eucinostomus gula	757	3.2	30.7	3.94	1.16	409.42	194.00	73	0.39	42	107
Mugil cephalus	606	2.6	54.2	3.16	0.46	201.84	37.00	267	2.74	81	438
Centropomus undecimalis	566	2.4	62.5	2.95	0.34	161.02	35.00	434	6.02	116	936
Harengula jaguana	451	1.9	12.0	2.35	1.69	994.98	320.00	91	0.68	51	164
Brevoortia spp.	450	1.9	7.8	2.34	1.40	825.49	231.00	126	4.03	50	301
Arius felis	398	1.7	50.0	2.07	0.30	199.03	25.00	295	2.45	72	402
Subtotal	18,507	79.2	.	.	.	.	.	.	.	37	936
Totals	**23,371**	**100.0**	**.**	**121.72**	**15.26**	**173.68**	**1,419.00**	**.**	**.**	**15**	**1230**

Table TQ02-03. Catch statistics for Selected Taxa collected in . 183-m haul seine samples during Tequesta stratified-random sampling, 2002. 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	1,163	5.0	66.1	6.06	0.92	210.29	80.00	182	1.60	60	347
Archosargus probatocephalus	816	3.5	72.9	4.25	0.46	149.22	38.00	255	2.25	41	414
Mugil cephalus	606	2.6	54.2	3.16	0.46	201.84	37.00	267	2.74	81	438
Centropomus undecimalis	566	2.4	62.5	2.95	0.34	161.02	35.00	434	6.02	116	936
Elops saurus	273	1.2	29.7	1.42	0.35	340.57	35.00	293	3.88	123	497
Micropogonias undulatus	263	1.1	15.1	1.37	0.62	631.56	100.00	273	2.89	50	389
Lutjanus synagris	165	0.7	10.9	0.86	0.33	534.19	45.00	93	1.57	49	160
Lutjanus griseus	146	0.6	23.4	0.76	0.19	350.01	25.00	163	3.84	55	280
Lutjanus analis	131	0.6	19.8	0.68	0.16	324.39	18.00	144	3.99	70	331
Sciaenops ocellatus	55	0.2	12.0	0.29	0.10	498.35	18.00	365	13.63	127	702
Mycteroperca microlepis	50	0.2	7.3	0.26	0.11	574.14	16.00	173	10.75	94	369
Pogonias cromis	46	0.2	7.8	0.24	0.12	719.13	23.00	286	11.98	149	457
Callinectes sapidus	31	0.1	13.0	0.16	0.03	290.42	3.00	127	5.37	80	197
Paralichthys albigutta	17	0.1	6.3	0.09	0.03	428.51	3.00	182	17.91	72	308
Scomberomorus maculatus	15	0.1	5.2	0.08	0.03	505.83	4.00	270	30.20	66	420
Trachinotus falcatus	14	0.1	4.2	0.07	0.03	552.32	4.00	100	28.95	46	454

Table TQ02-03. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Leiostomus xanthurus	14	0.1	2.6	0.07	0.05	859.26	8.00	92	10.20	62	206
Cynoscion nebulosus	11	0.0	3.6	0.06	0.02	597.34	3.00	200	31.34	67	439
Paralichthys lethostigma	10	0.0	4.2	0.05	0.02	546.59	3.00	329	26.28	171	507
Panulirus argus	8	0.0	2.6	0.04	0.02	770.12	4.00	48	7.22	15	78
Farfantepenaeus duorarum	5	0.0	1.6	0.03	0.02	916.06	3.00	30	0.86	27	32
Albula vulpes	4	0.0	1.0	0.02	0.02	1,093.72	3.00	193	39.12	130	307
Pomatomus saltatrix	4	0.0	2.1	0.02	0.01	687.36	1.00	339	81.16	98	447
Trachinotus carolinus	3	0.0	1.0	0.02	0.01	1,030.63	2.00	397	27.06	361	450
Epinephelus itajara	2	0.0	1.0	0.01	0.01	977.23	1.00	243	72.00	171	315
Menippe spp.	1	0.0	0.5	0.01	0.01	1,385.64	1.00	118	.	118	118
Epinephelus morio	1	0.0	0.5	0.01	0.01	1,385.64	1.00	144	.	144	144
Mycteroperca bonaci	1	0.0	0.5	0.01	0.01	1,385.64	1.00	87	.	87	87
Lutjanus apodus	1	0.0	0.5	0.01	0.01	1,385.64	1.00	112	.	112	112
Cynoscion spp.	1	0.0	0.5	0.01	0.01	1,385.64	1.00	302	.	302	302
Menticirrhus americanus	1	0.0	0.5	0.01	0.01	1,385.64	1.00	295	.	295	295
Totals	**4,424**	**18.9**	**97.9**	**23.04**	**1.77**	**106.70**	**132.00**	**.**	**.**	**15**	**936**

Appendix TQ02-01. Monthly summary of species collected during Tequesta stratified-random sampling, 2002. 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=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=192
Aetobatis narinari	.	.	.	.	.	1	.	.	.	.	.	.	1
Albula vulpes	.	.	.	.	.	.	.	.	.	.	4	.	4
Anisotremus virginicus	.	.	.	.	.	.	1	.	.	.	.	.	1
Archosargus probatocephalus	52	68	62	65	63	30	122	102	55	46	96	55	816
Archosargus rhomboidalis	6	11	19	6	5	5	10	10	4	6	6	5	93
Arius felis	2	27	38	51	27	34	72	38	29	24	30	26	398
Aulostomus maculatus	.	.	.	.	.	.	.	.	.	.	1	.	1
Bagre marinus	.	.	.	.	1	.	1	.	1	1	.	.	4
Bairdiella chrysoura	.	1	1	14	.	8	12	213	19	1	2	26	297
Brevoortia spp.	.	.	.	26	262	21	1	1	4	.	2	133	450
Calamus arctifrons	.	.	.	.	2	.	1	.	.	.	.	.	3
Callinectes sapidus	.	1	4	2	1	7	2	3	1	6	1	3	31
Caranx crysos	.	.	.	.	5	.	.	.	.	.	.	.	5
Caranx hippos	97	8	10	15	8	7	6	1	12	1	25	21	211
Caranx latus	.	.	5	.	2	.	.	.	1	.	.	.	8
Caranx spp.	.	.	.	1	1	2	.	.	1	4	1	.	10
Carcharhinus leucas	.	.	.	.	.	.	.	.	1	.	.	.	1
Centropomus parallelus	.	.	.	1	.	.	.	1	.	.	.	2	4
Centropomus undecimalis	64	38	82	34	53	31	25	68	46	38	53	34	566
Chaetodipterus faber	.	.	.	1	1	.	4	2	3	14	.	.	25
Chilomycterus antennatus	.	.	.	1	.	.	.	.	.	.	.	.	1
Chilomycterus schoepfi	13	3	8	12	17	18	2	6	17	3	23	8	130
Citharichthys macrops	.	.	.	.	.	.	1	3	.	.	.	.	4
Citharichthys spilopterus	.	.	.	2	.	6	1	4	2	5	1	2	23
Cynoscion nebulosus	.	.	.	1	1	.	.	1	5	.	.	3	11

Appendix TQ02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=192
Cynoscion spp.	.	.	.	1	.	.	.	.	.	.	.	.	1
Dasyatis americana	.	1	.	2	.	.	.	.	.	.	.	.	3
Dasyatis sabina	19	34	16	32	43	16	33	33	8	22	23	23	302
Dasyatis say	4	.	1	5	8	5	1	3	2	15	14	6	64
Diapterus auratus	65	142	267	1,148	228	98	382	506	465	533	287	308	4,429
Diapterus plumieri	1	2	.	3	19	1	7	1	5	6	2	4	51
Diodon holocanthus	.	.	.	.	.	.	.	.	.	.	.	1	1
Diodon hystrix	.	.	.	.	.	.	.	.	.	.	1	.	1
Diplodus spp.	.	.	.	1	.	.	.	.	.	.	.	.	1
Dorosoma spp.	.	.	.	.	.	.	.	.	1	3	.	.	4
Elops saurus	36	6	33	56	2	5	15	6	8	14	74	18	273
Epinephelus itajara	.	.	1	.	1	.	.	.	.	.	.	.	2
Epinephelus morio	.	.	1	.	.	.	.	.	.	.	.	.	1
Eucinostomus argenteus	.	.	.	.	.	.	6	.	.	.	.	.	6
Eucinostomus gula	4	13	3	48	85	6	79	51	239	32	89	108	757
Eucinostomus harengulus	1	1	1	5	29	8	4	4	.	20	11	.	84
Eucinostomus jonesi	.	.	.	.	.	.	.	.	.	.	4	.	4
Eucinostomus melanopterus	.	3	.	.	.	3	.	.	.	.	.	.	6
Eucinostomus spp.	.	.	.	29	.	.	.	.	12	3	.	.	44
Farfantepenaeus duorarum	.	.	.	1	.	1	.	.	.	.	.	3	5
Gerres cinereus	25	7	25	4	3	9	3	.	4	1	3	.	84
Gymnura micrura	9	3	2	1	1	2	.	.	.	.	1	1	20
Haemulon aurolineatum	1	.	.	.	.	1	5	5	10	2	2	1	27
Haemulon parrai	.	.	.	.	.	.	.	.	.	.	.	6	6
Haemulon plumieri	.	.	.	.	.	4	.	5	.	.	.	.	9
Haemulon sciurus	.	.	.	.	.	.	1	2	.	.	.	4	7

Appendix TQ02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=192
Halichoeres spp.	.	.	.	2	.	.	.	.	.	.	.	.	2
Harengula jaguana	.	7	5	61	10	11	3	2	2	6	322	22	451
Hemiramphus brasiliensis	.	.	.	2	7	1	.	.	.	.	.	.	10
Lachnolaimus maximus	.	.	.	7	.	6	2	14	.	.	.	1	30
Lactophrys quadricornis	.	1	.	.	.	.	.	.	.	.	1	1	3
Lactophrys trigonus	1	1	.	.	.	3	6	5	2	1	5	.	24
Lagodon rhomboides	291	189	64	293	350	800	1,104	2,820	1,350	366	188	1,056	8,871
Leiostomus xanthurus	.	.	.	8	3	.	2	.	.	1	.	.	14
Lepisosteus platyrhincus	.	.	.	.	.	.	.	.	1	.	.	.	1
Lobotes surinamensis	.	.	.	.	.	.	.	.	.	.	.	1	1
Lutjanus analis	2	1	.	21	4	14	13	17	22	9	27	1	131
Lutjanus apodus	.	.	.	.	.	.	1	.	.	.	.	.	1
Lutjanus griseus	2	1	5	8	15	15	18	12	7	37	3	23	146
Lutjanus synagris	.	.	.	40	16	15	16	11	3	8	8	48	165
Menippe spp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Menticirrhus americanus	1	.	.	.	.	.	.	.	.	.	.	.	1
Micropogonias undulatus	.	.	6	69	.	12	.	122	7	34	11	2	263
Monacanthus hispidus	.	.	.	9	.	4	4	5	.	.	2	3	27
Mugil cephalus	104	31	38	39	17	4	26	39	67	71	38	132	606
Mugil curema	151	81	152	59	38	20	22	23	268	96	75	178	1,163
Mycteroperca bonaci	.	.	.	.	1	.	.	.	.	.	.	.	1
Mycteroperca microlepis	.	.	2	1	.	6	13	19	3	1	.	5	50
Nicholsina usta	.	.	.	3	3	14	3	6	.	.	.	1	30
Ocyurus chrysurus	.	.	.	.	1	.	1	1	.	.	.	.	3
Oligoplites saurus	.	.	.	.	3	.	3	28	15	8	9	84	150
Opisthonema oglinum	1	.	.	12	2	.	18	5	.	5	11	133	187

Appendix TQ02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=192
Opsanus tau	1	2	.	.	.	1	2	.	.	1	.	1	8
Orthopristis chrysoptera	.	4	.	5	63	106	58	52	28	1	5	48	370
Panulirus argus	.	.	.	.	.	.	.	5	.	.	1	2	8
Paralichthys albigutta	.	.	1	.	7	.	3	4	.	1	1	.	17
Paralichthys lethostigma	.	.	.	.	1	4	.	3	.	1	1	.	10
Pogonias cromis	3	.	4	4	.	1	1	1	1	25	3	3	46
Pomatomus saltatrix	1	.	.	.	1	.	.	.	.	.	2	.	4
Prionotus scitulus	1	2	.	1	.	.	.	.	.	.	.	.	4
Rhinobatos lentiginosus	.	.	.	.	.	.	.	.	.	1	.	.	1
Sciaenops ocellatus	19	8	5	2	.	.	4	.	7	1	4	5	55
Scomberomorus maculatus	.	1	1	2	.	.	3	1	1	4	.	2	15
Scorpaena grandicornis	.	.	.	.	.	.	.	.	1	.	.	.	1
Scorpaena plumieri	.	.	.	.	.	1	3	5	5	.	1	1	16
Selene vomer	21	6	27	50	17	19	24	12	46	54	44	53	373
Sparisoma chrysopterum	.	.	.	.	.	.	.	38	.	.	1	.	39
Sparisoma radians	.	.	.	.	.	.	7	16	.	.	14	.	37
Sparisoma spp.	.	.	.	4	.	.	.	.	.	.	.	.	4
Sphoeroides nephelus	19	12	10	2	4	15	17	19	15	10	10	9	142
Sphoeroides spengleri	1	1	2	1	.	3	4	2	3	1	4	3	25
Sphoeroides testudineus	21	7	14	10	7	11	15	24	16	12	2	16	155
Sphyraena barracuda	6	6	6	.	6	3	13	10	49	65	21	18	203
Sphyraena picudilla	.	.	.	.	1	.	.	.	.	.	.	.	1
Sphyrna tiburo	.	.	.	.	.	.	.	.	.	1	.	.	1
Strongylura marina	.	.	.	.	1	.	.	.	.	.	.	1	2
Strongylura notata	21	4	3	5	38	1	5	4	6	12	65	6	170
Strongylura spp.	.	.	.	1	.	.	.	.	.	.	.	.	1

Appendix TQ02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=16	E=192
Symphurus plagiusa	.	.	.	.	1	.	.	.	.	.	.	.	1
Synodus foetens	.	.	.	.	1	.	8	.	.	1	2	3	15
Trachinotus carolinus	.	.	.	.	1	.	.	2	.	.	.	.	3
Trachinotus falcatus	2	.	2	.	.	.	4	2	1	2	.	1	14
Trinectes maculatus	1	2	1	.	2	.	.	.	1	1	.	.	8
Totals	**1,069**	**736**	**927**	**2,289**	**1,490**	**1,419**	**2,223**	**4,398**	**2,882**	**1,637**	**1,637**	**2,664**	**23,371**

Appendix TQ02-02. Summary by gear, stratum, and zone of species collected during Tequesta stratified-random sampling, 2002. Sampling with the 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=146	E=46	E=48	E=48	E=96	E=192
Aetobatis narinari	1	.	.	1	.	1
Albula vulpes	1	3	.	1	3	4
Anisotremus virginicus	1	.	.	1	.	1
Archosargus probatocephalus	643	173	167	207	442	816
Archosargus rhomboidalis	70	23	36	57	.	93
Arius felis	313	85	92	128	178	398
Aulostomus maculatus	1	.	.	1	.	1
Bagre marinus	2	2	.	.	4	4
Bairdiella chrysoura	263	34	233	64	.	297
Brevoortia spp.	185	265	137	29	284	450
Calamus arctifrons	3	.	.	3	.	3
Callinectes sapidus	29	2	6	9	16	31
Caranx crysos	5	.	.	5	.	5
Caranx hippos	170	41	112	56	43	211
Caranx latus	2	6	.	8	.	8
Caranx spp.	7	3	6	4	.	10
Carcharhinus leucas	1	.	.	.	1	1
Centropomus parallelus	4	.	.	1	3	4
Centropomus undecimalis	448	118	260	206	100	566
Chaetodipterus faber	23	2	19	6	.	25
Chilomycterus antennatus	.	1	.	1	.	1
Chilomycterus schoepfi	90	40	31	85	14	130
Citharichthys macrops	2	2	1	1	2	4
Citharichthys spilopterus	18	5	1	5	17	23
Cynoscion nebulosus	3	8	6	5	.	11
Cynoscion spp.	1	.	.	1	.	1
Dasyatis americana	1	2	2	1	.	3
Dasyatis sabina	241	61	37	103	162	302
Dasyatis say	54	10	25	36	3	64
Diapterus auratus	3,653	776	1,047	2,686	696	4,429
Diapterus plumieri	42	9	.	20	31	51
Diodon holocanthus	1	.	.	1	.	1

Appendix TQ02-02. (Continued)

Species	Gear and Strata: 183-m haul seine Over	Nonover	Zone: I	J	T	Totals
	E=146	E=46	E=48	E=48	E=96	E=192
Diodon hystrix	1	.	.	1	.	1
Diplodus spp.	.	1	.	1	.	1
Dorosoma spp.	4	.	.	.	4	4
Elops saurus	176	97	88	87	98	273
Epinephelus itajara	1	1	2	.	.	2
Epinephelus morio	.	1	1	.	.	1
Eucinostomus argenteus	6	.	3	3	.	6
Eucinostomus gula	451	306	150	588	19	757
Eucinostomus harengulus	46	38	29	25	30	84
Eucinostomus jonesi	3	1	.	3	1	4
Eucinostomus melanopterus	6	.	.	1	5	6
Eucinostomus spp.	21	23	3	35	6	44
Farfantepenaeus duorarum	1	4	5	.	.	5
Gerres cinereus	48	36	4	68	12	84
Gymnura micrura	17	3	1	3	16	20
Haemulon aurolineatum	26	1	9	18	.	27
Haemulon parrai	6	.	.	6	.	6
Haemulon plumieri	2	7	5	4	.	9
Haemulon sciurus	5	2	.	7	.	7
Halichoeres spp.	.	2	.	2	.	2
Harengula jaguana	365	86	24	411	16	451
Hemiramphus brasiliensis	5	5	7	3	.	10
Lachnolaimus maximus	10	20	3	27	.	30
Lactophrys quadricornis	3	.	.	3	.	3
Lactophrys trigonus	20	4	5	17	2	24
Lagodon rhomboides	7,551	1,320	5,695	3,172	4	8,871
Leiostomus xanthurus	14	.	2	12	.	14
Lepisosteus platyrhincus	.	1	.	.	1	1
Lobotes surinamensis	1	.	.	1	.	1
Lutjanus analis	96	35	66	62	3	131
Lutjanus apodus	1	.	.	1	.	1
Lutjanus griseus	121	25	57	80	9	146
Lutjanus synagris	88	77	39	121	5	165
Menippe spp.	1	.	.	1	.	1
Menticirrhus americanus	1	.	.	.	1	1
Micropogonias undulatus	258	5	1	207	55	263
Monacanthus hispidus	14	13	3	24	.	27

Appendix TQ02-02. (Continued)

Species	Gear and Strata 183-m haul seine Over	Nonover	Zone I	J	T	Totals
	E=146	E=46	E=48	E=48	E=96	E=192
Mugil cephalus	406	200	245	175	186	606
Mugil curema	749	414	274	503	386	1,163
Mycteroperca bonaci	.	1	1	.	.	1
Mycteroperca microlepis	40	10	30	20	.	50
Nicholsina usta	6	24	17	13	.	30
Ocyurus chrysurus	1	2	1	2	.	3
Oligoplites saurus	132	18	83	66	1	150
Opisthonema oglinum	185	2	151	30	6	187
Opsanus tau	7	1	5	3	.	8
Orthopristis chrysoptera	305	65	217	153	.	370
Panulirus argus	4	4	2	6	.	8
Paralichthys albigutta	15	2	7	8	2	17
Paralichthys lethostigma	10	.	.	4	6	10
Pogonias cromis	38	8	34	10	2	46
Pomatomus saltatrix	3	1	.	2	2	4
Prionotus scitulus	4	.	.	2	2	4
Rhinobatos lentiginosus	1	.	1	.	.	1
Sciaenops ocellatus	51	4	38	5	12	55
Scomberomorus maculatus	11	4	1	6	8	15
Scorpaena grandicornis	1	.	1	.	.	1
Scorpaena plumieri	10	6	3	12	1	16
Selene vomer	271	102	66	223	84	373
Sparisoma chrysopterum	1	38	.	39	.	39
Sparisoma radians	21	16	7	30	.	37
Sparisoma spp.	.	4	.	4	.	4
Sphoeroides nephelus	116	26	82	59	1	142
Sphoeroides spengleri	21	4	8	16	1	25
Sphoeroides testudineus	123	32	58	66	31	155
Sphyraena barracuda	152	51	105	93	5	203
Sphyraena picudilla	1	.	.	1	.	1
Sphyrna tiburo	1	.	.	1	.	1
Strongylura marina	1	1	1	.	1	2
Strongylura notata	140	30	114	54	2	170
Strongylura spp.	.	1	.	.	1	1
Symphurus plagiusa	.	1	.	.	1	1
Synodus foetens	15	.	1	14	.	15
Trachinotus carolinus	3	.	.	2	1	3

Appendix TQ02-02. (Continued)

Species	Gear and Strata 183-m haul seine		Zone			Totals
	Over	Nonover	I	J	T	
	E=146	E=46	E=48	E=48	E=96	E=192
Trachinotus falcatus	5	9	2	9	3	14
Trinectes maculatus	8	.	3	2	3	8
Totals	**18,505**	**4,866**	**9,978**	**10,359**	**3,034**	**23,371**

Florida Keys

The Florida Keys National Marine Sanctuary (FKNMS) is one of the country's largest marine sanctuaries (9,500 km^2) and includes the only living barrier coral reef in the continental United States. The Florida Keys are a chain of limestone islands running to the south and then west from the tip of the Florida peninsula, extending from Key Biscayne on the southeastern mainland coast to the Dry Tortugas, over 360 km to the southwest. The coastal and marine areas adjacent to the Keys contain many mangrove islands and extensive seagrass meadows, while to the south and east is the Florida Reef Tract, the third largest barrier reef system in the world (Jaap 1984).

Over 80,000 people reside permanently in the Keys, and more than four million visitors come to the islands annually. Over 70% of these visitors are estimated to use FKNMS waters for fishing, diving, boating, and other ecotourism activities (U.S. Dept. of Commerce 1996). Concerns that over-development of the islands and over-utilization of the surrounding marine environment were leading to environmental degradation were the principal reasons for the formation of the FKNMS (created in 1990). The ecological uniqueness of the area contained within the FKNMS is clearly evidenced by the fact that within its boundaries there are over a dozen previously established marine sanctuaries, wildlife refuges, aquatic preserves and state and national parks.

The FIM program was identified in the FKNMS Final Management Plan (U.S. Dept. of Commerce 1996) as a major component of the Sanctuary's long term fisheries monitoring program. The major program elements continued in 2002 consisted of a fall trawl survey, designed to identify nursery areas and monitor juvenile abundance, and a seasonal (spring through fall) visual census-based survey, designed to assess the relative abundance and population size structure of important reef fish species (primarily the snapper/grouper complex).

The trawl program consists of a single seasonal sampling event conducted from September through October with an objective of monitoring long-term trends in habitat utilization and extreme changes in relative juvenile abundances. Seasonal sampling takes place during late summer and early fall when overall abundances, as well as abundances of the majority of Selected Taxa, are at annual maximums.

The visual survey program consists of a seasonal (spring through fall) sampling period utilizing point count methodology to assess the relative size and abundance of recreationally and commercially important reef fish species. Visual point counts are conducted on the reef from April through October. Visual surveys are not conducted during the winter months due to the increased occurrence of turbidity and inclement weather during this time of year.

The trawling and visual survey programs are based on the standard FIM stratified-random sampling design. A habitat-based site selection process, based on the Florida Keys Benthic Habitat Geographical Information System (FDEP/NOAA 1998), was also employed. Grids containing bottom habitat mapped as continuous or patchy seagrass (with the exception of patchy seagrass habitat in backreef areas, which our reconnaissance surveys showed to contain too many intermixed corals and sponges to allow trawling operations) were included in the trawl survey sampling universe, whereas grids with bottom habitat mapped as reef were included in the visual survey sampling universe.

Trawl sampling was conducted in Zones B, C, and D in September and October 2002 (Figure KY02-01). One three-minute trawl was conducted at each selected site, with a total of 80 sites sampled in September and October. The visual sampling program began in April 2002 and was conducted monthly in Zones A-D through October 2002. Four 5-m radius circular point counts were conducted at each of the 39 selected sites per month, with a total of 273 sites sampled from April through October. Divers enumerated and assigned to distinct size intervals all snappers, groupers, grunts, hogfish, triggerfish, and selected major tropical ornamental species (Table KY02-01). This section summarizes the fourth year of routine Fisheries-Independent Monitoring (FIM) program sampling in the coastal and oceanic waters of the FKNMS.

Stratified-Random Sampling

A total of 46,225 fishes and selected invertebrates, representing 115 taxa, were collected or recorded during 80 trawl collections and 1,092 visual surveys in 2002 (Table KY02-02; Appendices KY02-01, -02, -03 and -04).

6.1-m Otter Trawls. A total of 5,369 fish and selected invertebrates, representing 73 taxa, were collected in 80 trawl samples in the FKNMS in 2002 (Table KY02-03; Appendices KY02-01 and -02). *Monacanthus ciliatus* (n=941) dominated the overall catch while *Haemulon plumieri* (n=877) dominated the Selected Taxa caught (Tables KY02-03 and –04). This was a change from the 2001 season in which *H. plumieri* dominated both the overall and selected species. Only two other Selected Taxa, *Lutjanus synagris* and *Lutjanus griseus,* were among the ten dominant taxa and accounted for only 3.1%, and 1.4% of the total catch, respectively. In addition to *M. ciliatus* and *H. plumieri*, overall trawl catches were dominated by *Eucinostomus* spp., *Lagodon rhomboides*, and *Eucinostomus gula***,** each of which constituted between 12.5% and 16.5% percent of the total catch. Selected Taxa (n=1,294) (which include species from both the statewide FIM Selected Taxa list and the Selected Reef Fish list) comprised 24.1% of the total individuals caught.

There were very clear spatial differences in abundance between areas sampled (Appendix KY02-02). Similar to results seen in 2001, the overall number of animals collected in the Gulfside stratum (G) was more than four times higher than those in the Oceanside stratum (O). The number of animals collected in Zones C and D were more than three times those collected in Zone B. These collections were slightly higher than those reported for the same zones in 2001. However, in 2002 the zone with the highest number of animals collected shifted from C to D. These findings again confirm that the very large seagrass beds in southwestern Florida Bay may be exceptionally important finfish nursery areas within the FKNMS.

Visual Censuses. A total of 40,856 animals of Selected Reef Fish species were recorded during 1,092 5-m radius point counts in 2002 (Tables KY02-02 and -05; Appendices KY02-03 and -04). During point count surveys, 51 of the 53 Selected Reef Fish Species were observed. Overall mean densities observed from point counts were about 48-animals/100 m^2 and most of these fish were from the smallest size classes (Table KY02-05 and -06).

Once again haemulids strongly dominated the point count observations, accounting for 74.4% of the individuals recorded, with *H. plumieri*, *Haemulon flavolineatum*, *Haemulon aurolineatum*, and *Haemulon sciurus* comprising 61.7% of the total number of individuals (Table KY02-05). The other major dominant species in the point count surveys was *Ocyurus chrysurus* (8.4% of all individuals; 32.9% of non-grunt species). *Lutjanus griseus, Lachnolaimus maximus, and Lutjanus apodus* were the second through fourth most abundant non-grunt species. These three species, in addition to *O. chrysurus,* accounted for 62.5% of the non-grunt species observed in point count surveys. Two selected species that had not been reported in previous point counts, *Lutjanus buccanella* and *Mycteroperca interstitialis* were observed for the first time in 2002. Adults of both species are reportedly primarily found in deep water and rarely seen near shore, although juveniles may occasionally be seen on the reefs.

Overall length-frequencies observed during point counts have been largely similar between years for most species. Length ranges and size distributions for economically important species such as *O. chrysurus, L. griseus, L. maximus, Epinephelus morio,* and *Mycteroperca bonaci* shown in Table KY02-06 are typical of what has been observed in previous years. An important exception, however, has been observed in species of *Haemulon*, which have shown large fluctuations in the numbers and proportions of the smallest size class (< 5 cm TL) within species between years. These fluctuations may be, in part, a reflection of true inter-annual differences in juvenile recruitment, but are also clearly influenced by identification problems associated with the presence of large schools of very small individuals. Unless at least some members of these schools are large enough to be visually positively identified to the species level, these fishes can only be recorded to the genus level (*Haemulon* spp.). As a result, numbers reported for this smallest size class should be considered as incomplete on a species by species basis. This issue has not been a problem for the non-haemulid species surveyed, which all appear to recruit to reef habitats at sizes which allow for conclusive visual identification.

Overall numbers of fishes recorded during visual point count surveys were higher during late summer (August and September) than during the other five months in which sampling was completed, but there was limited evidence of distinct seasonal changes in abundance of individual species (Appendix KY02-03). The lowest overall numbers of animals were recorded in April and June (4,405 and 4,627 animals per month, respectively), while peak numbers were observed during August and September (8,580 and 7,067 animals per month).

Most of the more abundant species were present during all months sampled and exhibited monthly fluctuations that did not show any consistent trends, however two haemulids did show an exception to this pattern. *Haemulon aurolineatum* was present in relatively large numbers in August and September, and *H. flavolineatum* showed a strong peak during August as well (Appendix KY02-03). This summer peak indicates a potentially crucial time period for grunt recruitment and settlement in the Keys.

With respect to sampling areas, Zone D had the highest overall mean count per survey of 93 animals/sample, while Zone B had the lowest at 29 animals/sample (Appendix KY02-04). This was a slight change from 2001 during which Zone C had the highest overall mean count of 47 animals/sample, and Zone D had the lowest at 27 animals/sample. The visual survey results are once again consistent with those obtained by the trawl sampling program in that the largest number of animals/sample were collected in the Middle Keys, indicating the relative importance of the Middle Keys for fish abundance.

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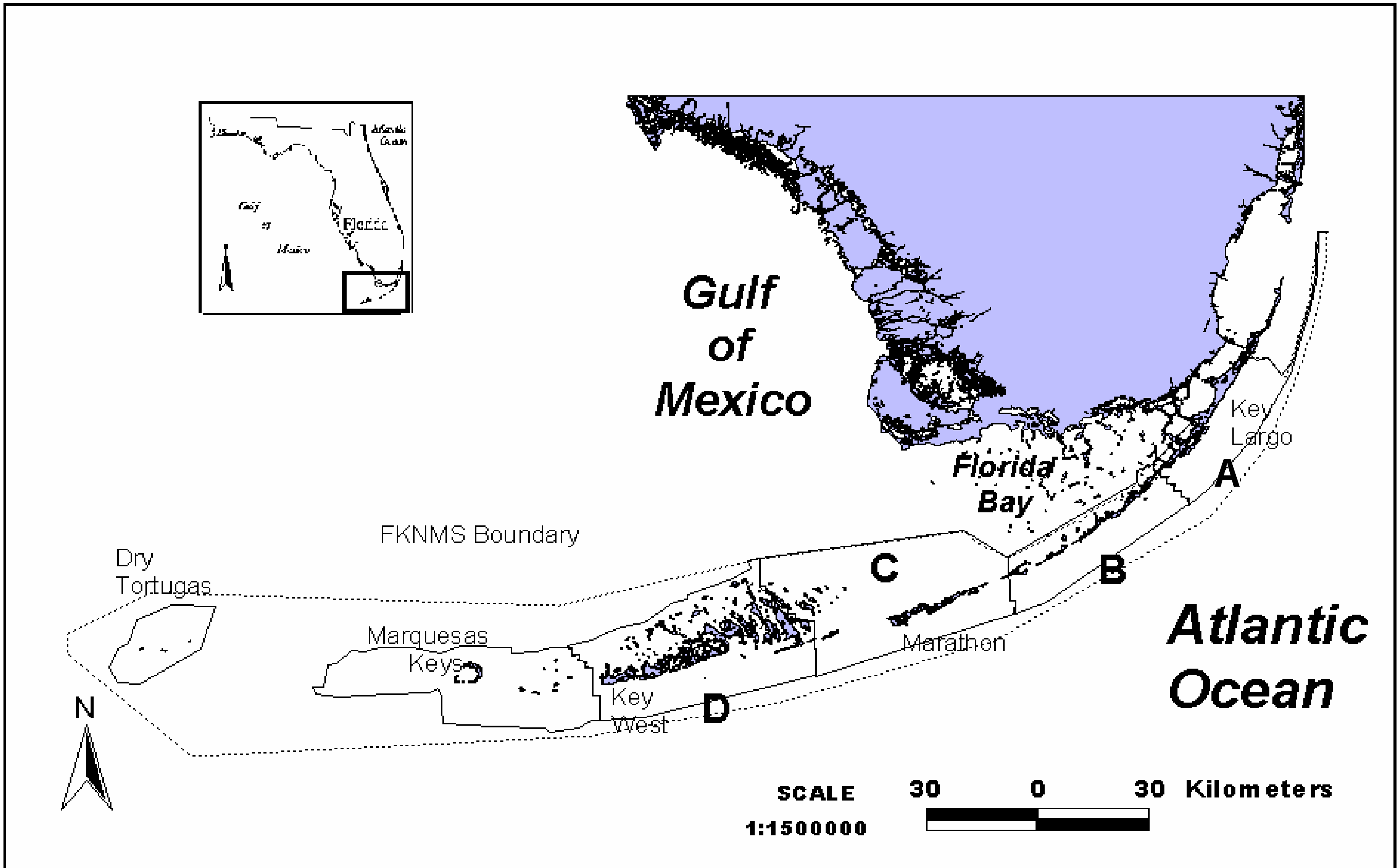

Figure KY02-01. Map of FIM sampling areas in the Florida Keys National Marine Sanctuary. Zones are labeled A-D.

Table KY02-01. Animals designated as Selected Reef Fish Species because of their recreational or commercial importance.

	Scientific Name	Common Name
1	*Anisotremus surinamensis*	black margate
2	*Anisotremus virginicus*	porkfish
3	*Balistes capriscus*	gray triggerfish
4	*Balistes vetula*	queen triggerfish
5	*Bodianus pulchellus*	spotfin hogfish
6	*Bodianus rufus*	Spanish hogfish
7	*Canthidermis sufflamen*	ocean triggerfish
8	*Chaetodon capistratus*	foureye butterflyfish
9	*Chaetodon ocellatus*	spotfin butterflyfish
10	*Chaetodon sedentarius*	reef butterflyfish
11	*Chaetodon striatus*	banded butterflyfish
12	*Epinephelus adscensionis*	rock hind
13	*Epinephelus cruentatus*	graysby
14	*Epinephelus fulvus*	coney
15	*Epinephelus guttatus*	red hind
16	*Epinephelus itajara*	goliath grouper
17	*Epinephelus morio*	red grouper
18	*Epinephelus striatus*	Nassau grouper
19	*Haemulon album*	margate
20	*Haemulon aurolineatum*	tomtate
21	*Haemulon carbonarium*	caesar grunt
22	*Haemulon chrysargyreum*	smallmouth grunt
23	*Haemulon flavolineatum*	French grunt
24	*Haemulon macrostomum*	Spanish grunt
25	*Haemulon melanurum*	cottonwick
26	*Haemulon parrai*	sailors choice
27	*Haemulon plumieri*	white grunt
28	*Haemulon sciurus*	bluestriped grunt
29	*Haemulon striatum*	striped grunt
30	*Holacanthus bermudensis*	blue angelfish
31	*Holacanthus ciliaris*	queen angelfish
32	*Holacanthus tricolor*	rock beauty
33	*Lachnolaimus maximus*	hogfish
34	*Lutjanus analis*	mutton snapper
35	*Lutjanus apodus*	schoolmaster
36	*Lutjanus buccanella*	blackfin snapper
37	*Lutjanus cyanopterus*	cubera snapper
38	*Lutjanus griseus*	gray snapper
39	*Lutjanus jocu*	dog snapper
40	*Lutjanus mahogoni*	mahogany snapper
41	*Lutjanus synagris*	lane snapper
42	*Melichthys niger*	black durgon
43	*Mycteroperca bonaci*	black grouper

Table KY02-01. (Continued)

	Scientific Name	Common Name
44	*Mycteroperca microlepis*	gag grouper
45	*Mycteroperca phenax*	scamp
46	*Mycteroperca tigris*	tiger grouper
47	*Mycteroperca venenosa*	yellowfin grouper
48	*Mycteroperca interstitialis*	yellowmouth grouper
49	*Ocyurus chrysurus*	yellowtail snapper
50	*Pomacanthus arcuatus*	gray angelfish
51	*Pomacanthus paru*	French angelfish
52	*Priacanthus arenatus*	bigeye
53	*Priacanthus cruentatus*	glasseye snapper

Table KY02-02. Summary of effort and catch data for Florida Keys stratified-random sampling, 2002. Zones were located linearly along the Keys island chain from the Upper Keys (Zone A) through the Lower Keys (Zone D).

	6.1-m Otter Trawl		Visual Census		Totals	
Zone	**Animals**	**Hauls**	**Animals**	**Counts**	**Animals**	**Samples**
A			12,253	376	12,253	376
B	518	18	8,079	264	8,597	282
C	2,051	32	10,917	176	12,968	208
D	2,800	30	9,607	276	12,407	306
Totals	**5,369**	**80**	**40,856**	**1,092**	**46,225**	**1,172**

Table KY02-03. Catch statistics for ten dominant taxa collected in 80 seasonal 6.1-m otter trawl samples during Florida Keys stratified-random sampling, 2002. Percent (%) is the percentage of the total catch represented by that species; percent occurrence (% Occur) is the percentage of samples in which the species was collected; CV is the coefficient of variation. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**%**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**	**Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Monacanthus ciliatus	941	17.5	80.8	2.71	0.36	116.46	14.39	58	0.47	10	104
Eucinostomus spp.	886	16.5	42.3	2.55	0.86	295.65	48.35	28	0.20	15	40
Haemulon plumieri	877	16.3	70.5	2.53	0.42	146.61	19.11	73	0.96	18	172
Lagodon rhomboides	742	13.8	55.1	2.14	0.38	157.23	19.56	81	0.53	42	147
Eucinostomus gula	671	12.5	43.6	1.93	0.48	220.94	28.33	53	0.46	40	95
Lutjanus synagris	169	3.1	46.2	0.49	0.13	233.38	8.77	76	1.94	12	138
Calamus spp.	98	1.8	28.2	0.28	0.06	202.59	2.70	74	1.98	32	165
Nicholsina usta	81	1.5	34.6	0.23	0.06	213.61	3.37	127	2.52	62	185
Lutjanus griseus	75	1.4	29.5	0.22	0.06	246.59	3.60	129	5.11	29	280
Lactophrys quadricornis	75	1.4	52.6	0.22	0.03	127.03	1.12	101	3.92	9	181
Subtotal	4,615	85.8	.	.	.	.	.	.	.	9	280
Totals	**5,369**	**100.0**	**.**	**15.09**	**2.03**	**120.41**	**88.15**	**.**	**.**	**5**	**625**

Table KY02-04. Catch statistics for Selected taxa collected in 80 seasonal 6.1-m otter trawl samples during Florida Keys stratified random sampling, 2002. Percent (%) is the percent of the total catch represented by that species; percent occurrence (% Occur) is the percentage of samples in which the species was collected; CV is the coefficient of variation. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**%**	**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
	No.	**%**	**Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Haemulon plumieri	877	16.3	70.5	2.53	0.41	146.60	19.11	73	0.96	18	172
Lutjanus synagris	169	3.1	46.2	0.49	0.12	233.38	8.76	76	1.93	12	138
Lutjanus griseus	75	1.4	29.5	0.22	0.06	246.58	3.59	129	5.10	29	280
Haemulon sciurus	30	0.6	12.8	0.08	0.03	353.65	1.79	128	4.55	87	182
Lachnolaimus maximus	30	0.6	16.7	0.08	0.02	299.92	1.79	119	8.78	31	235
Panulirus argus	24	0.4	17.9	0.06	0.01	247.38	0.89	48	3.30	17	84
Farfantepenaeus duorarum	18	0.3	11.5	0.05	0.02	348.65	1.12	14	1.20	6	26
Haemulon flavolineatum	18	0.3	2.6	0.05	0.04	834.91	3.82	29	1.20	19	39
Ocyurus chrysurus	17	0.3	12.8	0.04	0.01	301.71	0.67	72	8.18	34	161
Haemulon aurolineatum	9	0.2	1.3	0.02	0.02	883.17	2.02	21	0.63	19	25
Anisotremus virginicus	6	0.1	2.6	0.01	0.01	748.67	1.12	118	12.99	66	152
Menippe spp.	5	0.1	5.1	0.01	0.00	459.46	0.44	42	22.49	5	125
Epinephelus morio	5	0.1	5.1	0.01	0.00	459.46	0.44	177	13.07	145	215
Paralichthys albigutta	4	0.1	3.8	0.01	0.00	534.94	0.44	217	36.55	122	295

Table KY02-04. (Continued)

Species	Number		%	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%	Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Pomacanthus paru	2	0.0	2.6	0.00	0.00	620.43	0.22	104	61.50	42	165
Mycteroperca microlepis	1	0.0	1.3	0.00	0.00	883.17	0.22	157	.	157	157
Lutjanus analis	1	0.0	1.3	0.00	0.00	883.17	0.22	119	.	119	119
Chaetodon ocellatus	1	0.0	1.3	0.00	0.00	883.17	0.22	66	.	66	66
Chaetodon capistratus	1	0.0	1.3	0.00	0.00	883.17	0.22	57	.	57	57
Pomacanthus arcuatus	1	0.0	1.3	0.00	0.00	883.17	0.22	28	.	28	28
Totals	**1,294**	**100.0**	**.**	**3.63**	**0.55**	**135.62**	**23.61**	**.**	**.**	**5**	**295**

Table KY02-05. Catch statistics for Selected Reef Fish Species observed in 1,092 point counts during Florida Keys sampling, 2002. Percent (%) is the percentage of total observations represented by that species; percent occurrence (% Occur) is the percentage of samples in which the species was observed; CV is the coefficient of variation. Taxa are ranked in order of decreasing mean density.

Species	**Number**		**% Occur**	**Density Estimate (animals/100m^2)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**
Haemulon plumieri	8,343	20.4	52.1	9.73	0.74	251.54	393.43
Haemulon flavolineatum	5,803	14.2	22.7	6.77	1.01	494.33	522.03
Haemulon aurolineatum	5,783	14.2	7.2	6.74	1.20	588.59	636.62
Haemulon sciurus	5,275	12.9	26.5	6.15	0.61	326.28	254.65
Ocyurus chrysurus	3,440	8.4	38.6	4.01	0.36	298.16	178.25
Haemulon spp.	2,316	5.7	2.4	2.70	0.82	997.76	636.62
Lutjanus griseus	1,598	3.9	19.0	1.86	0.23	412.08	101.86
Haemulon chrysargyreum	830	2.0	1.9	0.97	0.36	1,218.55	254.65
Lachnolaimus maximus	798	2.0	38.0	0.93	0.05	189.80	17.83
Lutjanus apodus	710	1.7	7.5	0.83	0.19	770.50	165.52
Haemulon melanurum	685	1.7	2.5	0.80	0.30	1,235.84	222.82
Anisotremus virginicus	652	1.6	19.6	0.76	0.12	519.06	87.85
Chaetodon capistratus	568	1.4	25.5	0.66	0.04	195.53	7.64
Pomacanthus arcuatus	529	1.3	28.7	0.62	0.04	210.15	16.55
Chaetodon ocellatus	395	1.0	20.1	0.46	0.03	214.39	7.64
Haemulon carbonarium	390	1.0	1.3	0.45	0.26	1,913.35	254.65

Table KY02-05. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m^2)			
	No.	%		Mean	Stderr	CV	Max
Chaetodon sedentarius	326	0.8	16.8	0.38	0.03	251.02	7.64
Holacanthus tricolor	274	0.7	15.4	0.32	0.03	285.85	8.91
Epinephelus cruentatus	237	0.6	16.7	0.28	0.02	249.37	3.82
Bodianus rufus	214	0.5	13.8	0.25	0.02	296.39	7.64
Holacanthus ciliaris	200	0.5	13.6	0.23	0.02	279.24	5.09
Epinephelus morio	171	0.4	12.7	0.20	0.02	288.21	5.09
Mycteroperca bonaci	149	0.4	10.5	0.17	0.02	326.60	5.09
Lutjanus analis	148	0.4	10.0	0.17	0.02	347.46	5.09
Lutjanus synagris	130	0.3	1.6	0.15	0.06	1,264.55	44.56
Holacanthus bermudensis	120	0.3	8.5	0.14	0.02	364.26	5.09
Chaetodon striatus	117	0.3	6.9	0.14	0.02	398.08	5.09
Pomacanthus paru	104	0.3	7.2	0.12	0.01	389.46	5.09
Haemulon macrostomum	104	0.3	2.2	0.12	0.06	1,575.43	57.30
Haemulon striatum	100	0.2	0.2	0.12	0.08	2,335.59	63.66
Balistes capriscus	71	0.2	3.2	0.08	0.02	712.88	10.19
Haemulon parrai	59	0.1	1.6	0.07	0.03	1,321.06	25.46
Anisotremus surinamensis	30	0.1	1.1	0.03	0.02	1,433.37	14.01
Lutjanus mahogoni	29	0.1	1.1	0.03	0.01	1,250.02	8.91

Table KY02-05. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m^2)			
	No.	%		Mean	Stderr	CV	Max
Epinephelus adscensionis	19	0.0	1.6	0.02	0.01	828.47	2.55
Haemulon album	17	0.0	0.5	0.02	0.01	2,119.10	12.73
Epinephelus guttatus	15	0.0	0.8	0.02	0.01	1,262.16	3.82
Mycteroperca microlepis	14	0.0	1.3	0.02	0.00	877.90	1.27
Lutjanus jocu	13	0.0	1.0	0.02	0.00	1,043.77	2.55
Epinephelus striatus	11	0.0	1.0	0.01	0.00	991.78	1.27
Epinephelus fulvus	11	0.0	1.0	0.01	0.00	991.78	1.27
Balistes vetula	11	0.0	0.9	0.01	0.00	1,079.02	2.55
Mycteroperca phenax	10	0.0	0.7	0.01	0.00	1,318.63	3.82
Bodianus pulchellus	7	0.0	0.5	0.01	0.00	1,413.34	2.55
Mycteroperca venenosa	6	0.0	0.5	0.01	0.00	1,555.28	2.55
Priacanthus arenatus	4	0.0	0.4	0.00	0.00	1,650.00	1.27
Lutjanus buccanella	4	0.0	0.1	0.00	0.00	3,304.54	5.09
Canthidermis sufflamen	4	0.0	0.3	0.00	0.00	2,022.06	2.55
Melichthys niger	4	0.0	0.2	0.00	0.00	2,335.59	2.55
Epinephelus itajara	3	0.0	0.2	0.00	0.00	2,462.16	2.55
Mycteroperca interstitialis	3	0.0	0.3	0.00	0.00	1,906.13	1.27
Priacanthus cruentatus	2	0.0	0.2	0.00	0.00	2,335.59	1.27

Table KY02-05. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m^2)			
	No.	%		Mean	Stderr	CV	Max
Haemulids	**30,387**	**74.4**	**.**	**35.43**			
Other Species	**10,469**	**25.6**	**.**	**12.21**			
Totals	**40,856**	**100.0**	**.**	**47.64**	**2.61**	**181.25**	**739.75**

Table KY02-06. Size distribution of Selected Reef Fishes recorded during 1,092 visual point count surveys in the Florida Keys during 2002.

	ESTIMATED TOTAL LENGTHS (cm)																	
Scientific Name	**< 5**	**5-10**	**10-15**	**15-20**	**20-25**	**25-30**	**30-35**	**35-40**	**40-45**	**45-50**	**50-55**	**55-60**	**60-70**	**70-80**	**80-90**	**90-100**	**100+**	**Totals**
Haemulon plumieri	872	451	1,720	3,002	1,879	396	23											8,343
Haemulon flavolineatum	2,518	714	1,795	714	61	1												5,803
Haemulon aurolineatum	4,343	703	478	254	5													5,783
Haemulon sciurus	81	175	920	2,469	1,319	279	32											5,275
Ocyurus chrysurus	7	233	409	1,141	947	440	173	71	17		2							3,440
Haemulon spp.	2,316																	2,316
Lutjanus griseus		9	108	216	381	409	227	124	68	27	12	17						1,598
Haemulon chrysargyreum	330	88	294	118														830
Lachnolaimus maximus		2	20	196	304	166	72	23	10	1	2	1	1					798
Lutjanus apodus		7	38	159	235	96	118	23	34									710
Haemulon melanurum	333	73	200	52	27													685
Anisotremus virginicus	43	19	67	201	244	67	10	1										652
Chaetodon capistratus	35	495	37		1													568
Pomacanthus arcuatus		6	11	47	95	151	151	53	15									529
Chaetodon ocellatus		69	324	2														395
Haemulon carbonarium	35	289	25	24	16	1												390
Chaetodon sedentarius	37	242	39	8														326
Holacanthus tricolor	58	89	82	42	2		1											274
Epinephelus cruentatus		14	55	102	51	10	4	1										237
Bodianus rufus	70	37	22	25	30	22	8											214
Holacanthus ciliaris	9	6	25	30	55	38	26	8	2	1								200
Epinephelus morio			1		4	12	32	41	33	19	9	9	10	1				171
Mycteroperca bonaci				4	21	11	25	28	18	10	7	10	6	5	3		1	149
Lutjanus analis				3		6	13	23	30	23	17	17	12	3		1		148
Lutjanus synagris		3	13	55	49	8	2											130
Holacanthus bermudensis	3	1	3	8	17	36	26	22	4									120
Chaetodon striatus	5	52	56	4														117
Pomacanthus paru	1	2	8	10	23	28	23	5	3	1								104
Haemulon macrostomum	7	10	2	8	29	32	14	1	1									104
Haemulon striatum	80	20																100
Balistes capriscus			12	24	23	6	3	2	1									71
Haemulon parrai	20	1	4	3	13	18												59
Anisotremus surinamensis				4		3	9	4	7	2	1							30
Lutjanus mahogoni			1		8	4	8	6		2								29
Epinephelus adscensionis				1	5	8	2	2	1									19
Haemulon album					4	10		1		1	1							17
Epinephelus guttatus			1	3	2	3	3	1	1	1								15
Mycteroperca microlepis							1	3	3	1	2	1	2	1				14

Table KY02-06. (Continued)

Scientific Name	ESTIMATED TOTAL LENGTHS (cm)																	
	< 5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-70	70-80	80-90	90-100	100+	Totals
Lutjanus jocu				1			3	6		2		1						13
Balistes vetula				1	1	1	3	3	2									11
Epinephelus striatus						1		2		1	2	1	4					11
Epinephelus fulvus		3	4	3		1												11
Mycteroperca phenax					2		1	2	2	2	1							10
Bodianus pulchellus		5	2															7
Mycteroperca venenosa						2					1	3						6
Priacanthus arenatus				1	1		1			1								4
Lutjanus buccanella	4																	4
Canthidermis sufflamen							2	2										4
Melichthys niger					2	2												4
Mycteroperca interstitialis					1	1		1										3
Epinephelus itajara													1			1	1	3
Priacanthus cruentatus						1		1										2
Totals	**11,207**	**3,818**	**6,776**	**8,935**	**5,857**	**2,270**	**1,016**	**460**	**252**	**95**	**57**	**60**	**36**	**10**	**3**	**2**	**2**	**40,856**

Appendix KY02-01. Monthly summary of species collected during Florida Keys stratified-random sampling, 2002. Listing is sorted alphabetically by taxa. Effort, or total number of hauls, is labeled 'E'.

Species	Month		
	Sep	Oct	Totals
	E=39	E=41	E=80
Ahlia egmontis	.	1	1
Anarchopterus criniger	.	1	1
Anisotremus virginicus	5	1	6
Archosargus rhomboidalis	12	13	25
Astrapogon stellatus	.	1	1
Bairdiella batabana	2	3	5
Bairdiella chrysoura	1	14	15
Bothus ocellatus	5	5	10
Calamus arctifrons	17	8	25
Calamus proridens	3	2	5
Calamus spp.	68	30	98
Caranx ruber	1	.	1
Chaetodon capistratus	1	.	1
Chaetodon ocellatus	1	.	1
Chilomycterus schoepfi	15	16	31
Cosmocampus albirostris	1	1	2
Cryptotomus roseus	.	8	8
Diodon holocanthus	1	6	7
Diplectrum formosum	9	2	11
Epinephelus morio	4	1	5
Eucinostomus gula	535	136	671
Eucinostomus spp.	811	75	886
Farfantepenaeus duorarum	14	4	18
Floridichthys carpio	1	.	1
Gobiosoma bosc	1	.	1
Gobiosoma macrodon	.	1	1
Gymnothorax saxicola	.	1	1
Gymnothorax vicinus	.	1	1
Haemulon aurolineatum	.	9	9
Haemulon flavolineatum	1	17	18
Haemulon plumieri	488	389	877

Appendix KY02-01. (Continued)

Species	Month		
	Sep	Oct	Totals
	E=39	E=41	E=80
Haemulon sciurus	26	4	30
Haemulon spp.	4	10	14
Halichoeres bivittatus	.	4	4
Hemipteronotus splendens	.	1	1
Hippocampus erectus	3	2	5
Hypoplectrus unicolor	22	18	40
Lachnolaimus maximus	2	28	30
Lactophrys bicaudalis	.	1	1
Lactophrys quadricornis	36	39	75
Lactophrys trigonus	7	1	8
Lagodon rhomboides	470	272	742
Lucania parva	15	8	23
Lutjanus analis	1	.	1
Lutjanus griseus	59	16	75
Lutjanus synagris	128	41	169
Menippe spp.	4	1	5
Monacanthus ciliatus	485	456	941
Monacanthus hispidus	31	21	52
Mycteroperca microlepis	1	.	1
Nicholsina usta	33	48	81
Ocyurus chrysurus	8	9	17
Ogcocephalus radiatus	.	1	1
Opsanus beta	29	19	48
Orthopristis chrysoptera	38	11	49
Panulirus argus	16	8	24
Paraclinus fasciatus	1	.	1
Paraclinus marmoratus	1	.	1
Paralichthys albigutta	4	.	4
Pomacanthus arcuatus	.	1	1
Pomacanthus paru	.	2	2
Pseudupeneus maculatus	.	1	1
Scaridae spp.	.	6	6
Scarus spp.	.	7	7
Scarus taeniopterus	3	.	3

Appendix KY02-01. (Continued)

Species	Month		
	Sep	Oct	Totals
	E=39	E=41	E=80
Scorpaena brasiliensis	3	7	10
Scorpaena grandicornis	1	.	1
Sparisoma chrysopterum	22	33	55
Sparisoma radians	1	5	6
Sparisoma rubripinne	.	1	1
Sparisoma spp.	6	1	7
Sparisoma viride	.	3	3
Sphoeroides spengleri	7	24	31
Starksia ocellata	.	1	1
Syacium papillosum	.	1	1
Syngnathus floridae	13	12	25
Syngnathus scovelli	1	.	1
Synodus foetens	16	2	18
Urolophus jamaicensis	1	2	3
Totals	**3495**	**1874**	**5369**

Appendix KY02-02. Summary by stratum (G = Gulfside, O = Oceanside) and zone of species collected during Florida Keys stratified-random seasonal 6.1-m otter trawl sampling, 2002. Effort, or the total number of hauls, is labeled ‘E’. Taxa are listed in alphabetical order.

Species	Gear: 6.1-m otter trawl		Zone			Totals
	Gulf	Ocean	B	C	D	
	E=51	E=29	E=18	E=32	E=30	E=80
Ahlia egmontis	.	1	.	1	.	1
Anarchopterus criniger	1	.	.	1	.	1
Anisotremus virginicus	6	.	.	1	5	6
Archosargus rhomboidalis	25	.	.	22	3	25
Astrapogon stellatus	.	1	1	.	.	1
Bairdiella batabana	5	.	.	4	1	5
Bairdiella chrysoura	15	.	.	15	.	15
Bothus ocellatus	4	6	4	1	5	10
Calamus arctifrons	25	.	1	9	15	25
Calamus proridens	4	1	1	1	3	5
Calamus spp.	98	.	.	36	62	98
Caranx ruber	1	.	.	1	.	1
Chaetodon capistratus	1	.	.	1	.	1
Chaetodon ocellatus	1	.	.	.	1	1
Chilomycterus schoepfi	24	7	12	8	11	31
Cosmocampus albirostris	2	.	1	.	1	2
Cryptotomus roseus	.	8	2	6	.	8
Diodon holocanthus	.	7	3	3	1	7
Diplectrum formosum	9	2	2	.	9	11
Epinephelus morio	2	3	1	.	4	5
Eucinostomus gula	668	3	3	198	470	671
Eucinostomus spp.	884	2	.	120	766	886
Farfantepenaeus duorarum	15	3	4	.	14	18
Floridichthys carpio	1	.	.	.	1	1
Gobiosoma bosc	1	.	.	.	1	1
Gobiosoma macrodon	1	.	.	1	.	1
Gymnothorax saxicola	.	1	1	.	.	1
Gymnothorax vicinus	.	1	.	1	.	1
Haemulon aurolineatum	.	9	9	.	.	9
Haemulon flavolineatum	1	17	17	.	1	18

Appendix KY02-02. (Continued)

Species	Gear		Zone			Totals
	6.1-m otter trawl					
	Gulf	Ocean	B	C	D	
	E=51	E=29	E=18	E=32	E=30	E=80
Haemulon plumieri	697	180	163	361	353	877
Haemulon sciurus	22	8	1	4	25	30
Haemulon spp.	4	10	10	.	4	14
Halichoeres bivittatus	.	4	4	.	.	4
Hemipteronotus splendens	.	1	.	1	.	1
Hippocampus erectus	3	2	2	.	3	5
Hypoplectrus unicolor	40	.	.	27	13	40
Lachnolaimus maximus	30	.	1	29	.	30
Lactophrys bicaudalis	.	1	.	1	.	1
Lactophrys quadricornis	56	19	11	35	29	75
Lactophrys trigonus	7	1	1	.	7	8
Lagodon rhomboides	712	30	12	424	306	742
Lucania parva	23	.	.	23	.	23
Lutjanus analis	1	.	.	.	1	1
Lutjanus griseus	75	.	.	28	47	75
Lutjanus synagris	151	18	.	57	112	169
Menippe spp.	4	1	1	.	4	5
Monacanthus ciliatus	789	152	158	439	344	941
Monacanthus hispidus	41	11	6	22	24	52
Mycteroperca microlepis	1	.	.	.	1	1
Nicholsina usta	81	.	.	66	15	81
Ocyurus chrysurus	13	4	3	10	4	17
Ogcocephalus radiatus	1	.	.	1	.	1
Opsanus beta	38	10	8	22	18	48
Orthopristis chrysoptera	49	.	.	17	32	49
Panulirus argus	21	3	5	6	13	24
Paraclinus fasciatus	1	.	.	1	.	1
Paraclinus marmoratus	1	.	.	.	1	1
Paralichthys albigutta	4	.	.	.	4	4
Pomacanthus arcuatus	.	1	1	.	.	1
Pomacanthus paru	.	2	2	.	.	2
Pseudupeneus maculatus	.	1	1	.	.	1
Scaridae spp.	.	6	6	.	.	6

Appendix KY02-02. (Continued)

Species	Gear: 6.1-m otter trawl		Zone			Totals
	Gulf	Ocean	B	C	D	
	E=51	E=29	E=18	E=32	E=30	E=80
Scarus spp.	1	6	7	.	.	7
Scarus taeniopterus	.	3	.	.	3	3
Scorpaena brasiliensis	3	7	6	2	2	10
Scorpaena grandicornis	1	.	.	.	1	1
Sparisoma chrysopterum	33	22	16	20	19	55
Sparisoma radians	3	3	5	1	.	6
Sparisoma rubripinne	.	1	1	.	.	1
Sparisoma spp.	.	7	.	1	6	7
Sparisoma viride	2	1	1	2	.	3
Sphoeroides spengleri	12	19	16	8	7	31
Starksia ocellata	.	1	1	.	.	1
Syacium papillosum	.	1	.	1	.	1
Syngnathus floridae	20	5	6	7	12	25
Syngnathus scovelli	1	.	.	.	1	1
Synodus foetens	18	.	1	2	15	18
Urolophus jamaicensis	2	1	.	3	.	3
Totals	**4,755**	**614**	**518**	**2,051**	**2,800**	**5,369**

Appendix KY02-03. Monthly summary of Selected Reef species observed during Florida Keys visual surveys (point counts) 2002. Effort, or total number of surveys, is labeled "E". Taxa are listed in alphabetical order.

Species	Month							
	Apr	May	Jun	Jul	Aug	Sep	Oct	Totals
	E=156	E=156	E=156	E=156	E=156	E=156	E=156	E=1,092
Anisotremus surinamensis	1	6	.	2	3	3	15	30
Anisotremus virginicus	216	81	70	61	101	77	46	652
Balistes capriscus	14	18	3	12	18	5	1	71
Balistes vetula	3	1	2	1	2	1	1	11
Bodianus pulchellus	1	3	.	.	.	2	1	7
Bodianus rufus	29	31	22	31	38	35	28	214
Canthidermis sufflamen	1	3	.	.	.	.	.	4
Chaetodon capistratus	84	62	80	74	82	97	89	568
Chaetodon ocellatus	53	61	55	58	73	44	51	395
Chaetodon sedentarius	61	40	39	41	54	52	39	326
Chaetodon striatus	17	14	7	18	22	20	19	117
Epinephelus adscensionis	4	5	3	2	4	1	.	19
Epinephelus cruentatus	49	26	32	22	42	42	24	237
Epinephelus fulvus	1	1	1	4	1	2	1	11
Epinephelus guttatus	.	7	4	1	.	3	.	15
Epinephelus itajara	1	.	.	.	2	.	.	3
Epinephelus morio	30	34	29	17	21	25	15	171
Epinephelus striatus	5	2	.	.	1	1	2	11
Haemulon album	5	1	.	.	10	.	1	17
Haemulon aurolineatum	264	190	775	809	1,515	1,617	613	5,783
Haemulon carbonarium	4	20	49	2	.	212	103	390
Haemulon chrysargyreum	74	296	58	25	202	85	90	830
Haemulon flavolineatum	532	1,026	376	395	2,306	489	679	5,803
Haemulon macrostomum	5	15	19	46	3	3	13	104

Appendix KY02-03. (Continued)

Species	Month							
	Apr	May	Jun	Jul	Aug	Sep	Oct	Totals
	E=156	E=156	E=156	E=156	E=156	E=156	E=156	E=1,092
Haemulon melanurum	.	295	5	8	59	153	165	685
Haemulon parrai	9	6	5	.	30	9	.	59
Haemulon plumieri	880	1,041	1,389	967	1,406	1,477	1,183	8,343
Haemulon sciurus	595	652	692	587	981	1,171	597	5,275
Haemulon spp.	.	658	36	765	232	541	84	2,316
Haemulon striatum	.	.	.	100	.	.	.	100
Holacanthus bermudensis	22	12	14	11	19	23	19	120
Holacanthus ciliaris	23	41	27	19	27	29	34	200
Holacanthus tricolor	30	37	29	34	47	52	45	274
Lachnolaimus maximus	105	94	125	135	164	83	92	798
Lutjanus analis	28	32	15	9	34	19	11	148
Lutjanus apodus	176	87	18	224	112	71	22	710
Lutjanus buccanella	.	.	.	.	.	4	.	4
Lutjanus griseus	310	128	197	169	266	79	449	1,598
Lutjanus jocu	2	.	1	3	3	3	1	13
Lutjanus mahogoni	5	1	.	10	8	2	3	29
Lutjanus synagris	10	32	3	.	49	7	29	130
Melichthys niger	.	.	.	.	4	.	.	4
Mycteroperca bonaci	30	22	18	15	25	22	17	149
Mycteroperca interstitialis	2	.	.	1	.	.	.	3
Mycteroperca microlepis	4	2	5	1	1	1	.	14
Mycteroperca phenax	6	1	.	.	1	1	1	10
Mycteroperca venenosa	4	.	.	1	.	1	.	6
Ocyurus chrysurus	613	355	338	749	473	417	495	3,440
Pomacanthus arcuatus	81	63	71	65	121	70	58	529
Pomacanthus paru	13	17	15	12	18	15	14	104

Appendix KY02-03. (Continued)

Species	Month							
	Apr	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Totals**
	E=156	**E=156**	**E=156**	**E=156**	**E=156**	**E=156**	**E=156**	**E=1,092**
Priacanthus arenatus	3	.	.	1	.	.	.	4
Priacanthus cruentatus	.	.	.	.	.	1	1	2
Totals	**4,405**	**5,519**	**4,627**	**5,507**	**8,580**	**7,067**	**5,151**	**40,856**

Appendix KY02-04. Summary by zone of species collected during Florida Keys visual surveys (point counts), 2002. Effort, or total number of surveys, is labeled "E".

Species	Zone				Point Count
	A	B	C	D	Totals
	E=376	E=264	E=176	E=276	E=1092
Anisotremus surinamensis	19	8	2	1	30
Anisotremus virginicus	134	228	111	179	652
Balistes capriscus	13	44	6	8	71
Balistes vetula	8	2	1	.	11
Bodianus pulchellus	.	.	2	5	7
Bodianus rufus	54	50	45	65	214
Canthidermis sufflamen	1	2	.	1	4
Chaetodon capistratus	76	123	92	277	568
Chaetodon ocellatus	66	107	80	142	395
Chaetodon sedentarius	84	91	25	126	326
Chaetodon striatus	25	19	19	54	117
Epinephelus adscensionis	.	3	5	11	19
Epinephelus cruentatus	39	90	43	65	237
Epinephelus fulvus	.	2	6	3	11
Epinephelus guttatus	6	2	3	4	15
Epinephelus itajara	.	.	2	1	3
Epinephelus morio	71	52	21	27	171
Epinephelus striatus	4	1	4	2	11
Haemulon album	1	5	11	.	17
Haemulon aurolineatum	1,623	620	3,023	517	5,783
Haemulon carbonarium	335	36	14	5	390
Haemulon chrysargyreum	201	180	433	16	830
Haemulon flavolineatum	1,518	1,595	1,427	1,263	5,803
Haemulon macrostomum	5	68	22	9	104
Haemulon melanurum	465	8	54	158	685
Haemulon parrai	30	21	2	6	59
Haemulon plumieri	3,119	1,481	1,947	1,796	8,343
Haemulon sciurus	1,412	1,623	1,258	982	5,275
Haemulon spp.	665	126	674	851	2,316
Haemulon striatum	.	50	.	50	100
Holacanthus bermudensis	24	17	27	52	120

Appendix KY02-04. (Continued)

Species	Zone				Point Count
	A	B	C	D	Totals
	E=376	E=264	E=176	E=276	E=1092
Holacanthus ciliaris	75	31	31	63	200
Holacanthus tricolor	61	74	46	93	274
Lachnolaimus maximus	207	234	179	178	798
Lutjanus analis	89	25	17	17	148
Lutjanus apodus	100	284	160	166	710
Lutjanus buccanella	4	.	.	.	4
Lutjanus griseus	498	201	366	533	1,598
Lutjanus jocu	8	.	2	3	13
Lutjanus mahogoni	3	2	14	10	29
Lutjanus synagris	.	25	59	46	130
Melichthys niger	4	.	.	.	4
Mycteroperca bonaci	31	50	33	35	149
Mycteroperca interstitialis	.	2	.	1	3
Mycteroperca microlepis	.	3	4	7	14
Mycteroperca phenax	1	3	.	6	10
Mycteroperca venenosa	1	.	.	5	6
Ocyurus chrysurus	929	351	552	1,608	3,440
Pomacanthus arcuatus	207	110	80	132	529
Pomacanthus paru	36	29	14	25	104
Priacanthus arenatus	.	.	1	3	4
Priacanthus cruentatus	1	1	.	.	2
Totals	**12,253**	**8,079**	**10,917**	**9,607**	**40,856**

Northeast Florida

Northeast Florida is located in the southern region of the Atlantic Coastal Plain. Within this area lie three distinct waterways sampled by the Fisheries-Independent Monitoring (FIM) program: the lower St. Marys River Basin, the lower Nassau River Basin, and the lower St. Johns River Basin (Figure JX02-01). The lower St. Marys River Basin (4,092 km^2) encompasses the St. Marys River, Cumberland Sound, Amelia River (Intracoastal Waterway), and numerous tributaries. The lower Nassau River Basin (1,114 km^2) encompasses the Nassau River, Ft. George River, and many smaller tributaries. The lower St. Johns River Basin (7,123 km^2) is the drainage area for two sub-basins: the upper St. Johns River Basin and the Oklawaha River (Durako et al. 1988). The lower St. Johns is also commonly referred to as the St. Johns Estuary, indicating the area's potential importance as breeding and feeding grounds to local species of fish and wildlife (FIM Annual Report, 2001).

This section summarizes the monthly stratified-random sampling (SRS) data collected by the Fisheries-Independent Monitoring (FIM) program in northeast Florida during 2002. The sampling area included five zones: the lower St. Marys River Basin (Zone A), the lower Nassau River Basin (Zone B), and the lower St. Johns River (Zones C, D and E; Figure JX02-01). Monthly SRS was conducted using 21.3-m river seines, 183-m haul seines, and 6.1-m otter trawls. Eighty sites were sampled per month throughout the sampling universe with all gear types used in all zones. All gear deployment methods were the same as those described in the Methods section of this report. Several grids were eliminated from the sampling universe for each of the three gear types beginning January 2002. The grids were eliminated because they could not be sampled due to excessive water depth, mud depth, lack of proper shoreline, or the waterway was too narrow for the gear to be deployed properly.

Stratified-Random Sampling

A total of 198,370 fish and selected invertebrates were collected during northeast Florida SRS in 2002 (Table JX02-01; Appendices JX02-01 and -02). One hundred forty-five species were represented in 959 samples. *Anchoa mitchilli* were the most abundant fish collected (n=77,268), comprising 39.0 % of the 2002 total catch. Other small forage fishes were also among the most dominant species, including *Menidia menidia* (n=25,195), *Anchoa hepsetus* (n=21,852), *Menidia* spp. (n=8,880), *Brevoortia* spp. (n=5,693), and *Fundulus heteroclitus* (n=5,000). Four Selected Taxa were among the 10 dominant taxa collected: *Litopenaeus setiferus* (n=9,436), *Mugil cephalus* (n=6,391), *Micropogonias undulatus* (n=4,896), *Stellifer lanceolatus* (n=4,676), and *Leiostomus xanthurus* (n=2,921), accounted for 11.9% of the total catch.

21.3-m River Seines. A total of 148,219 animals were collected in 384 21.3-m river seine samples, representing 74.7 % of the total annual SRS catch (Tables JX02-01 and -02). The most abundant species was *A. mitchilli* (n=62,522) accounting for 42.2 % of the total catch. *Menida menidia* (n=25,195), *A. hepsetus* (n=21,565) and *Menidia* spp. (n=8,880) were also collected in large numbers. The ten most abundant taxa accounted for 94 % of the total catch with this gear (Table JX02-02).

Selected Taxa (n=14,812; 29 taxa) accounted for 10 % of the animals collected in 21.3-m river seines (Table JX02-03). *Litopenaeus setiferus* (n=7,136) was the most numerous of the Selected Taxa, occurring in 31.5 % of 21.3-m river seines. *Mugil cephalus* (n=3,337), *L. xanthurus* (n=1,729), *M. undulatus* (n=499), *Farfantepenaeus duorarum* (n=430), *Mugil curema* (n=373), *Callinectes sapidus* (n=330) and *Trachinotus carolinus* (n=310) were also abundant among the Selected Taxa.

183-m Haul Seines. A total of 17,628 animals were collected in 192 seine hauls (Tables JX02-01 and -04). The two most abundant taxa collected with the 183-m haul seine were *Brevoortia* spp. (n=5,587) and *M. cephalus* (n=3,052). These two taxa accounted for 49.0 % of the total catch with this gear.

There were 29 Selected Taxa represented in 183-m haul seine samples (Table JX02-05). In addition to *M. cephalus* (n=3,052), the other abundant Selected Taxa collected were *L. xanthurus* (n=904), *M. curema* (n=674), *C. sapidus* (n=241), *L. setiferus* (n=236) and *Cynoscion nebulosus* (n=225).

6.1-m Otter trawls. A total of 32,523 fish and selected invertebrates were collected in 383 samples (Tables JX02-01 and -06). *Anchoa mitchilli* (n=14,746) was the most abundant, accounting for 45.3 % of the total catch. *Stellifer lanceolatus*, (n=4,669), *M. undulatus* (n=4,285) and *L. setiferus* (n=2,064) were also collected in large numbers. Three taxa, *Cynoscion regalis* (n=651), *S. lanceolatus* (n=4,669), and *M. undulatus* (n=4,285), were more abundant in otter trawl collections compared to the other gears (Appendix JX02-02).

Twenty-five Selected Taxa (n=9,120) were collected in 6.1-m otter trawls, comprising 28.0 % of the total catch (Table JX02-07). The most numerous were *M. undulatus* (n=4,285) and *L. setiferus* (n=2,064). *Cynoscion regalis* (n=651), *C. sapidus* (n=597), *Menticirrhus americanus* (n=458), and *F. duorarum* (n=437) were also present in large numbers.

References

Durako, M. J., M. D. Murphy, and K. D. Haddad. 1988. Assessment of Fisheries Habitat: Northeast Florida. Florida Department of Natural Resources, Bureau of Marine Research, Marine Research Laboratories, St. Petersburg, Florida. 51 pp.

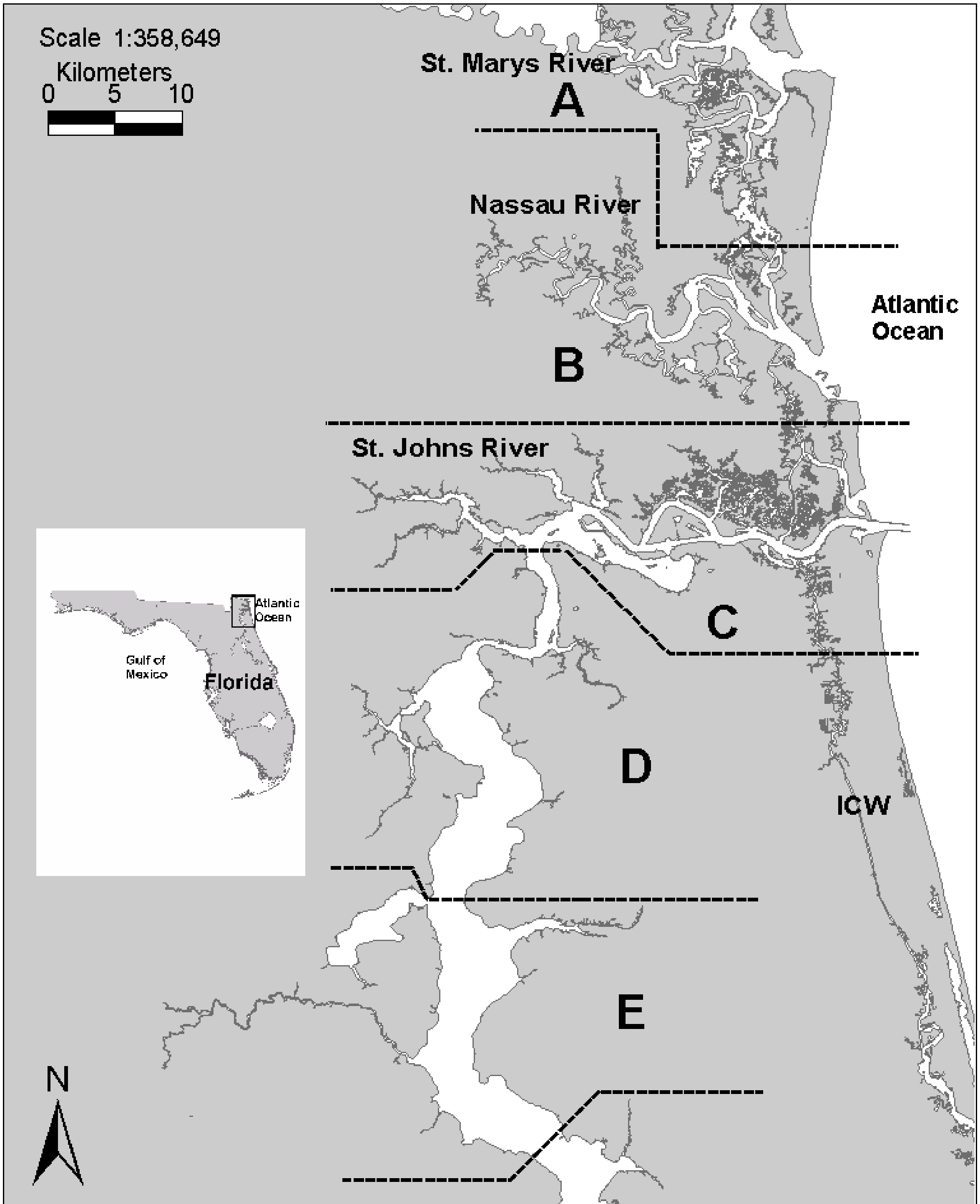

Figure JX 02-01. Map of northeast Florida sampling area. Zones are labeled A-E.

Table JX02-01. Summary of catch and effort data for Northeast Florida stratified-random sampling, 2002.

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	44,333	96	4,648	48	15,113	96	64,094	240
B	32,891	96	3,677	47	6,982	95	43,550	238
C	54,818	96	8,073	49	4,725	96	67,616	241
D	12,164	49	397	24	2,765	50	15,326	123
E	4,013	47	833	24	2,938	46	7,784	117
Totals	**148,219**	**384**	**17,628**	**192**	**32,523**	**383**	**198,370**	**959**

Table JX02-02. Catch statistics for 10 dominant taxa collected in 384 21.3-m river seine samples during Northeast Florida stratified-random sampling, 2002. 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/100m²)**				**Standard Length (mm)**			
	No.	**%**		**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	62,522	42.2	56.5	239.44	45.02	368.49	10,070.59	33	0.03	16	71
Menidia menidia	25,195	17.0	28.4	96.49	40.03	812.93	13,505.88	34	0.06	21	85
Anchoa hepsetus	21,565	14.5	28.9	82.59	27.39	649.87	6,263.24	34	0.06	10	92
Menidia spp.	8,880	6.0	47.4	34.01	7.11	409.72	1,470.59	42	0.15	12	88
Litopenaeus setiferus	7,136	4.8	31.5	27.33	5.13	367.93	941.18	12	0.05	2	29
Fundulus heteroclitus	4,997	3.4	26.8	19.14	6.70	685.94	1,917.65	38	0.16	14	83
Mugil cephalus	3,337	2.3	31.8	12.78	4.26	653.20	1,242.65	29	0.54	16	312
Bairdiella chrysoura	2,129	1.4	14.6	8.15	3.66	879.21	1,157.35	34	0.33	7	151
Membras martinica	1,791	1.2	8.1	6.86	2.88	823.73	792.65	38	0.25	14	62
Leiostomus xanthurus	1,729	1.2	30.5	6.62	1.20	355.86	202.94	32	0.52	6	157
Subtotal	139,281	94.0	.	.	.	.	.	.	.	2	312
Totals	**148,219**	**100.0**	**.**	**567.63**	**80.17**	**276.76**	**18,585.29**	**.**	**.**	**2**	**689**

Table JX02-03. Catch statistics for Selected Taxa collected in 384 21.3-m river seine samples during Northeast Florida stratified-random sampling, 2002. 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
Litopenaeus setiferus	7,136	4.8	31.5	27.33	5.13	367.93	941.18	12	0.05	2	29
Mugil cephalus	3,337	2.3	31.8	12.78	4.26	653.20	1,242.65	29	0.54	16	312
Leiostomus xanthurus	1,729	1.2	30.5	6.62	1.20	355.86	202.94	32	0.52	6	157
Micropogonias undulatus	499	0.3	19.8	1.91	0.57	584.78	189.71	30	0.80	10	158
Farfantepenaeus duorarum	430	0.3	13.5	1.65	0.51	606.85	155.88	11	0.16	4	22
Mugil curema	373	0.3	13.5	1.43	0.43	591.58	116.18	46	1.66	18	182
Callinectes sapidus	330	0.2	22.9	1.26	0.18	285.55	39.71	46	2.03	6	182
Trachinotus carolinus	310	0.2	3.6	1.19	0.45	750.46	86.76	30	0.84	10	69
Cynoscion nebulosus	139	0.1	12.0	0.53	0.12	447.88	30.88	48	3.16	12	217
Sciaenops ocellatus	88	0.1	10.7	0.34	0.07	407.39	13.24	53	7.06	10	330
Menticirrhus littoralis	72	0.0	1.6	0.28	0.25	1,770.86	95.59	40	1.86	16	105
Farfantepenaeus aztecus	70	0.0	3.4	0.27	0.12	906.24	42.65	12	0.57	5	23
Trachinotus falcatus	47	0.0	3.4	0.18	0.07	710.02	16.18	29	2.21	10	64
Lutjanus griseus	44	0.0	4.7	0.17	0.06	695.10	16.18	33	3.44	11	124
Paralichthys albigutta	40	0.0	6.5	0.15	0.04	490.13	10.29	70	7.64	16	203
Menticirrhus americanus	37	0.0	3.1	0.14	0.06	796.23	14.71	58	4.17	18	103

Table JX02-03. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Paralichthys lethostigma	33	0.0	6.0	0.13	0.03	490.90	7.35	108	17.14	11	293
Scomberomorus maculatus	20	0.0	1.0	0.08	0.05	1,213.36	16.18	63	2.94	34	90
Elops saurus	18	0.0	2.9	0.07	0.03	732.52	7.35	63	6.56	30	121
Cynoscion regalis	15	0.0	1.0	0.06	0.04	1,243.82	11.76	42	5.35	23	93
Archosargus probatocephalus	14	0.0	3.1	0.05	0.02	586.13	2.94	133	28.72	16	436
Lutjanus synagris	9	0.0	1.3	0.03	0.02	1,169.78	7.35	46	8.66	20	86
Pogonias cromis	9	0.0	1.8	0.03	0.01	838.42	4.41	139	17.02	80	211
Pomatomus saltatrix	7	0.0	0.5	0.03	0.02	1,702.10	8.82	85	7.71	41	101
Menippe spp.	2	0.0	0.5	0.01	0.01	1,383.83	1.47	45	31.00	14	76
Centropomus undecimalis	1	0.0	0.3	0.00	0.00	1,959.59	1.47	95	.	95	95
Mycteroperca microlepis	1	0.0	0.3	0.00	0.00	1,959.59	1.47	155	.	155	155
Lutjanus analis	1	0.0	0.3	0.00	0.00	1,959.59	1.47	19	.	19	19
Menticirrhus saxatilis	1	0.0	0.3	0.00	0.00	1,959.59	1.47	55	.	55	55
Totals	**14,812**	**10.0**	**84.1**	**56.72**	**7.21**	**249.05**	**1,247.06**	**.**	**.**	**2**	**436**

Table JX02-04. Catch statistics for 10 dominant taxa collected in 192 183-m haul seine samples during Northeast Florida stratified-random sampling, 2002. 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
Brevoortia spp.	5,587	31.7	20.3	29.10	21.18	1,008.59	3,922.00	112	0.26	40	225
Mugil cephalus	3,052	17.3	72.4	15.90	4.68	407.64	854.00	199	0.76	23	396
Stomolophus meleagris	1,422	8.1	10.9	7.41	6.49	1,213.86	1,243.00	63	0.29	35	125
Dasyatis sabina	1,024	5.8	54.2	5.33	0.80	208.67	89.00	226	1.77	97	661
Leiostomus xanthurus	904	5.1	42.7	4.71	1.42	417.15	201.00	121	0.81	75	250
Mugil curema	674	3.8	35.4	3.51	0.72	285.30	66.00	143	1.40	103	337
Lagodon rhomboides	651	3.7	34.4	3.39	0.83	338.35	125.00	104	0.87	63	180
Bairdiella chrysoura	411	2.3	21.4	2.14	0.65	423.26	80.00	124	0.80	98	175
Opisthonema oglinum	374	2.1	9.4	1.95	1.47	1,045.72	278.00	119	1.13	13	184
Callinectes sapidus	241	1.4	30.2	1.26	0.25	274.68	24.00	97	2.53	30	222
Subtotal	14,340	81.3	.	.	.	.	.	.	.	13	661
Totals	**17,628**	**100.0**	**.**	**91.81**	**22.92**	**345.93**	**3,952.00**	**.**	**.**	**11**	**1213**

Table JX02-05. Catch statistics for Selected Taxa collected in 192 183-m haul seine samples during Northeast Florida stratified-random sampling, 2002. 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	3,052	17.3	72.4	15.90	4.68	407.64	854.00	199	0.76	23	396
Leiostomus xanthurus	904	5.1	42.7	4.71	1.42	417.15	201.00	121	0.81	75	250
Mugil curema	674	3.8	35.4	3.51	0.72	285.30	66.00	143	1.40	103	337
Callinectes sapidus	241	1.4	30.2	1.26	0.25	274.68	24.00	97	2.53	30	222
Litopenaeus setiferus	236	1.3	7.8	1.23	0.68	760.96	104.00	24	0.30	11	37
Cynoscion nebulosus	225	1.3	28.6	1.17	0.25	300.93	35.00	267	4.90	117	568
Archosargus probatocephalus	214	1.2	29.2	1.11	0.22	275.08	26.00	276	6.26	67	483
Elops saurus	191	1.1	24.5	0.99	0.23	322.76	28.00	287	5.69	126	532
Sciaenops ocellatus	122	0.7	20.3	0.64	0.13	285.93	11.00	361	8.76	108	631
Micropogonias undulatus	112	0.6	12.0	0.58	0.24	577.38	41.00	158	3.93	85	275
Paralichthys lethostigma	111	0.6	21.4	0.58	0.14	331.81	19.00	193	7.16	75	347
Scomberomorus maculatus	108	0.6	14.1	0.56	0.15	366.84	16.00	211	6.24	81	391
Pogonias cromis	70	0.4	15.6	0.36	0.09	350.83	13.00	219	10.02	129	497
Trachinotus carolinus	61	0.3	2.1	0.32	0.26	1,125.83	49.00	121	5.25	71	265
Pomatomus saltatrix	54	0.3	10.9	0.28	0.09	421.81	10.00	241	9.29	86	361
Farfantepenaeus duorarum	26	0.1	2.6	0.14	0.09	916.93	16.00	23	0.74	11	31

Table JX02-05. (Continued)

Species	Number		% Occur	Catch-per-unit-effort (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Menticirrhus americanus	25	0.1	7.3	0.13	0.05	555.00	9.00	186	10.37	112	275
Paralichthys albigutta	23	0.1	10.9	0.12	0.03	309.44	3.00	124	7.49	65	186
Lutjanus griseus	15	0.1	4.2	0.08	0.03	522.52	3.00	158	12.90	85	230
Cynoscion regalis	15	0.1	4.2	0.08	0.03	584.50	5.00	153	7.76	125	241
Trachinotus falcatus	11	0.1	2.1	0.06	0.04	860.02	6.00	165	21.07	52	271
Farfantepenaeus aztecus	4	0.0	1.0	0.02	0.01	977.23	2.00	32	0.25	32	33
Lutjanus synagris	4	0.0	1.0	0.02	0.02	1,093.72	3.00	103	6.84	90	121
Menticirrhus littoralis	3	0.0	1.0	0.02	0.01	1,030.63	2.00	171	16.18	148	202
Menticirrhus saxatilis	3	0.0	1.6	0.02	0.01	795.80	1.00	266	116.43	125	497
Menippe spp.	2	0.0	1.0	0.01	0.01	977.23	1.00	69	32.50	36	101
Centropomus undecimalis	2	0.0	0.5	0.01	0.01	1,385.64	2.00	225	45.00	180	270
Rachycentron canadum	2	0.0	1.0	0.01	0.01	977.23	1.00	209	26.50	182	235
Paralichthys dentatus	1	0.0	0.5	0.01	0.01	1,385.64	1.00	153	.	153	153
Totals	**6,511**	**36.9**	**93.8**	**33.91**	**5.55**	**226.84**	**940.00**	**.**	**.**	**11**	**631**

Table JX02-06. Catch statistics for 10 dominant taxa collected in 383 river 6.1-m otter trawl samples during Northeast Florida stratified-random sampling, 2002. 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	14,746	45.3	52.7	5.20	1.02	384.04	192.12	38	0.07	10	78
Stellifer lanceolatus	4,669	14.4	10.4	1.65	1.03	1,224.61	318.81	19	0.16	11	100
Micropogonias undulatus	4,285	13.2	42.6	1.53	0.33	416.97	100.78	36	0.31	8	230
Litopenaeus setiferus	2,064	6.3	46.0	0.73	0.12	322.60	30.49	17	0.13	2	45
Trinectes maculatus	674	2.1	25.6	0.25	0.06	455.56	12.82	44	0.80	8	153
Cynoscion regalis	651	2.0	22.7	0.23	0.05	444.51	10.52	43	0.92	9	220
Callinectes sapidus	597	1.8	40.5	0.21	0.02	218.99	4.05	77	1.70	10	195
Menticirrhus americanus	458	1.4	20.4	0.16	0.04	506.45	10.39	36	1.03	11	240
Farfantepenaeus duorarum	437	1.3	27.7	0.16	0.02	297.39	3.78	17	0.35	4	39
Etropus crossotus	361	1.1	18.5	0.13	0.03	479.25	7.69	75	0.90	24	124
Subtotal	28,942	88.9	.	.	.	.	.	.	.	2	240
Totals	**32,523**	**100.0**	**.**	**11.51**	**1.55**	**263.14**	**333.38**	**.**	**.**	**2**	**722**

Table JX02-07. Catch statistics for Selected Taxa collected in 383 river 6.1-m otter trawl samples during Northeast Florida stratified-random sampling, 2002. 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	4,285	13.2	42.6	1.53	0.33	416.97	100.78	36	0.31	8	230
Litopenaeus setiferus	2,064	6.3	46.0	0.73	0.12	322.60	30.49	17	0.13	2	45
Cynoscion regalis	651	2.0	22.7	0.23	0.05	444.51	10.52	43	0.92	9	220
Callinectes sapidus	597	1.8	40.5	0.21	0.02	218.99	4.05	77	1.70	10	195
Menticirrhus americanus	458	1.4	20.4	0.16	0.04	506.45	10.39	36	1.03	11	240
Farfantepenaeus duorarum	437	1.3	27.7	0.16	0.02	297.39	3.78	17	0.35	4	39
Leiostomus xanthurus	288	0.9	20.1	0.10	0.02	318.41	2.83	92	1.98	12	173
Farfantepenaeus aztecus	112	0.3	6.0	0.04	0.01	605.90	2.70	21	0.61	9	34
Paralichthys lethostigma	62	0.2	11.5	0.02	0.00	330.83	0.67	176	9.61	18	354
Mugil curema	32	0.1	0.8	0.01	0.01	1,836.44	4.05	96	1.70	79	120
Archosargus probatocephalus	28	0.1	5.7	0.01	0.00	494.64	0.67	207	19.30	75	392
Paralichthys albigutta	25	0.1	4.7	0.01	0.00	516.19	0.40	121	13.23	16	215
Elops saurus	15	0.0	1.6	0.01	0.00	1,039.43	1.12	39	1.13	31	46
Cynoscion nebulosus	12	0.0	2.3	0.00	0.00	723.40	0.40	91	18.14	23	205
Menippe spp.	10	0.0	1.6	0.00	0.00	870.62	0.40	47	6.83	28	106
Pogonias cromis	9	0.0	1.8	0.00	0.00	829.71	0.40	178	6.22	147	210

Table JX02-07. (Continued)

Species	Number		% Occur	Density Estimate (animals/100m²)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Lutjanus synagris	8	0.0	1.8	0.00	0.00	768.10	0.27	53	11.79	17	110
Menticirrhus saxatilis	8	0.0	1.0	0.00	0.00	1,144.54	0.54	23	3.30	15	43
Sciaenops ocellatus	7	0.0	1.8	0.00	0.00	733.86	0.13	171	53.56	60	422
Lutjanus griseus	5	0.0	1.3	0.00	0.00	870.62	0.13	55	12.56	22	97
Menticirrhus littoralis	3	0.0	0.3	0.00	0.00	1,957.04	0.40	16	0.88	14	17
Mugil cephalus	2	0.0	0.3	0.00	0.00	1,957.04	0.27	183	1.50	181	184
Penaeidae spp.	1	0.0	0.3	0.00	0.00	1,957.04	0.13	20	.	20	20
Farfantepenaeus brasiliensis	1	0.0	0.3	0.00	0.00	1,957.04	0.13	14	.	14	14
Paralichthys dentatus	1	0.0	0.3	0.00	0.00	1,957.04	0.13	225	.	225	225
Totals	**9,121**	**28.0**	**88.0**	**3.24**	**0.37**	**225.61**	**102.00**	**.**	**.**	**2**	**422**

Appendix JX02-01. Monthly summary of species collected during Northeast Florida stratified-random sampling, 2002. 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=80	E=80	E=79	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=959
Achirus lineatus	6	2	7	5	4	5	1	2	7	11	6	2	58
Aetobatis narinari	.	.	.	.	.	1	.	.	1	.	.	.	2
Alosa aestivalis	.	.	.	.	2	.	.	.	.	.	.	.	2
Alosa mediocris	1	.	.	.	.	.	.	.	.	.	.	.	1
Aluterus monoceros	.	.	.	.	.	.	.	.	.	1	.	.	1
Ameiurus catus	4	6	11	3	3	.	1	.	3	34	19	60	144
Ameiurus nebulosus	.	.	.	.	.	.	13	2	1	.	.	.	16
Anchoa hepsetus	1	.	6	147	6,349	7,012	7,174	1,077	49	22	15	.	21,852
Anchoa mitchilli	5,630	988	3,341	5,703	4,780	5,345	14,462	9,336	3,626	11,214	6,428	6,415	77,268
Anchoa nasuta	.	.	.	.	17	.	4	.	.	.	.	.	21
Anchoa spp.	.	.	.	.	1	.	160	.	37	1	12	.	211
Ancylopsetta quadrocellata	.	1	5	7	1	.	.	.	.	.	.	.	14
Anguilla rostrata	.	.	.	.	.	.	.	.	.	.	1	.	1
Archosargus probatocephalus	31	9	18	13	33	38	22	5	38	20	18	11	256
Arius felis	.	.	1	2	11	.	5	.	2	10	10	3	44
Astroscopus y-graecum	2	.	.	2	.	1	.	1	.	.	.	.	6
Bagre marinus	.	.	.	1	.	2	1	9	3	1	.	.	17
Bairdiella chrysoura	11	118	156	9	1,634	396	96	24	35	85	120	92	2,776
Bathygobius soporator	.	.	.	1	.	.	1	.	.	4	1	1	8
Bothidae spp.	.	1	.	.	.	.	.	.	.	.	.	.	1
Brevoortia spp.	5	1,070	418	35	26	2	104	3,940	11	31	29	22	5,693
Callinectes sapidus	84	70	155	126	159	157	123	61	96	53	36	48	1,168
Caranx hippos	.	.	.	.	12	6	41	12	16	6	2	.	95
Caranx latus	.	.	.	.	.	.	.	.	.	1	2	.	3
Centropomus undecimalis	.	.	.	.	.	.	.	.	.	.	2	1	3

Appendix JX02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=80	E=80	E=79	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=959
Centropristis philadelphica	1	.	.	3	2	1	.	1	2	.	3	.	13
Centropristis striata	.	.	.	.	.	.	.	.	.	1	.	.	1
Chaetodipterus faber	.	1	.	.	13	10	26	39	40	5	2	.	136
Chasmodes bosquianus	.	2	.	.	.	.	2	.	1	.	1	.	6
Chilomycterus schoepfi	1	.	36	21	.	52	14	8	12	10	9	.	163
Chloroscombrus chrysurus	.	.	.	1	5	.	175	30	49	33	12	.	305
Citharichthys macrops	.	.	.	.	.	.	.	.	.	.	1	.	1
Citharichthys spilopterus	.	2	1	59	75	73	61	55	50	6	.	.	382
Citharichthys spp.	.	.	4	.	.	.	.	.	.	.	.	.	4
Cynoscion nebulosus	7	16	49	4	34	22	39	35	46	43	22	59	376
Cynoscion regalis	1	1	.	11	193	260	43	63	74	22	8	5	681
Cyprinodon variegatus	7	.	5	1	.	.	.	1	.	.	.	2	16
Dasyatis sabina	9	28	136	97	86	172	246	79	92	72	33	86	1,136
Dasyatis say	.	.	9	13	5	15	7	2	4	5	.	.	60
Diapterus auratus	1	.	.	.	.	.	.	3	8	23	9	12	56
Dorosoma cepedianum	1	.	4	11	.	16	5	3	4	.	.	1	45
Dorosoma petenense	8	.	.	.	.	.	.	.	.	4	2	.	14
Elops saurus	8	2	7	12	20	26	13	53	43	35	2	3	224
Etropus crossotus	18	5	113	9	1	29	22	67	159	40	22	12	497
Eucinostomus argenteus	.	.	.	.	.	.	.	.	.	1	.	.	1
Eucinostomus gula	.	.	.	.	17	2	18	6	9	11	12	9	84
Eucinostomus harengulus	4	7	3	9	26	109	274	70	65	92	129	64	852
Eucinostomus spp.	2	2	.	4	39	173	107	32	65	394	702	209	1,729
Farfantepenaeus aztecus	.	.	.	.	.	142	31	2	5	4	2	.	186
Farfantepenaeus brasiliensis	.	.	.	.	.	.	.	.	1	.	.	.	1
Farfantepenaeus duorarum	5	14	28	193	280	67	56	127	104	7	3	9	893

Appendix JX02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=80	E=80	E=79	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=959
Farfantepenaeus spp.	.	.	.	.	.	2	1	.	.	99	12	3	117
Fundulus heteroclitus	346	7	83	49	92	332	915	25	2,286	532	27	306	5,000
Fundulus majalis	15	3	7	3	11	21	35	48	7	9	22	22	203
Fundulus seminolis	11	.	.	5	.	.	.	.	.	.	1	.	17
Gambusia holbrooki	1	.	5	1	.	.	1	.	85	8	.	9	110
Gobiesox strumosus	3	.	1	.	.	.	3	.	1	.	.	.	8
Gobiidae spp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Gobioides broussoneti	.	.	.	.	.	.	.	.	1	.	.	.	1
Gobionellus boleosoma	4	24	20	22	9	5	7	15	6	12	5	5	134
Gobionellus oceanicus	.	.	.	6	.	.	.	.	1	1	.	.	8
Gobionellus shufeldti	.	1	1	.	.	.	.	3	.	.	5	2	12
Gobionellus smaragdus	2	.	.	.	3	.	2	.	.	30	1	1	39
Gobionellus spp.	.	.	.	.	.	.	.	.	.	.	.	3	3
Gobionellus stigmaticus	.	.	.	.	.	.	.	.	.	1	.	.	1
Gobiosoma bosc	1	7	16	20	4	4	6	.	4	1	8	4	75
Gobiosoma robustum	3	.	1	3	1	2	.	.	.	.	.	2	12
Gobiosoma spp.	.	.	.	.	.	41	2	1	6	21	1	1	73
Gymnura micrura	.	.	2	10	10	9	23	3	4	2	.	1	64
Harengula jaguana	.	.	.	.	.	2	1	1	.	1	.	.	5
Hippocampus erectus	.	.	1	.	.	.	.	.	.	.	.	1	2
Hyporhamphus meeki	.	.	.	.	.	.	.	1	.	.	.	.	1
Hypsoblennius hentzi	.	.	1	.	.	.	1	.	.	1	.	.	3
Ictalurus punctatus	14	19	14	2	.	.	.	4	8	1	10	19	91
Labidesthes sicculus	1	23	.	4	5	7	3	1	3	.	1	61	109
Lagodon rhomboides	16	25	98	59	108	60	165	76	223	69	106	18	1,023
Larimus fasciatus	.	.	.	.	.	52	.	.	16	.	.	.	68

Appendix JX02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=80	E=80	E=79	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=959
Leiostomus xanthurus	120	731	480	247	510	129	364	48	190	16	57	29	2,921
Lepisosteus osseus	1	.	11	5	4	.	1	4	23	5	20	3	77
Lepisosteus platyrhincus	.	.	.	4	3	2	2	9	.	1	3	2	26
Lepomis auritus	7	8	3	.	1	.	1	22	2	2	1	1	48
Lepomis macrochirus	98	39	18	24	8	.	5	6	7	34	7	11	257
Lepomis microlophus	21	11	18	9	.	.	10	4	.	17	19	7	116
Lepomis punctatus	3	.	.	18	3	.	3	.	.	.	.	.	27
Lepophidium brevibarbe	.	3	2	.	1	1	.	.	.	.	.	.	7
Limulus polyphemus	1	4	2	.	.	.	.	.	.	.	2	6	15
Litopenaeus setiferus	260	44	125	33	5	1,383	1,510	835	2,481	1,363	1,115	282	9,436
Lobotes surinamensis	.	.	.	.	2	.	.	.	.	.	.	.	2
Lucania parva	.	.	.	36	2	.	1	1	2	1	.	.	43
Lutjanidae spp.	.	.	.	.	.	.	.	.	1	.	.	.	1
Lutjanus analis	.	.	.	.	.	.	.	.	.	1	.	.	1
Lutjanus griseus	2	.	.	.	.	2	4	27	15	9	4	1	64
Lutjanus spp.	.	.	.	.	.	.	.	.	.	2	.	.	2
Lutjanus synagris	.	.	.	.	.	.	3	.	7	6	3	2	21
Membras martinica	8	.	.	.	34	761	332	616	24	17	3	.	1,795
Menidia menidia	.	.	.	.	.	13,417	7,217	2,460	520	299	861	421	25,195
Menidia spp.	483	849	886	435	3,050	680	81	32	94	879	1,071	340	8,880
Menippe spp.	.	1	.	2	6	1	2	.	1	.	1	.	14
Menticirrhus americanus	4	1	1	10	147	102	126	29	64	25	6	5	520
Menticirrhus littoralis	.	.	.	2	.	.	1	7	65	3	.	.	78
Menticirrhus saxatilis	1	.	1	1	7	.	.	2	.	.	.	.	12
Microgobius gulosus	5	5	1	27	3	21	.	4	8	105	2	3	184
Microgobius thalassinus	.	.	.	4	.	2	9	5	12	29	3	10	74

Appendix JX02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=80	E=80	E=79	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=959
Micropogonias undulatus	495	505	1,442	1,158	530	61	72	50	17	164	218	184	4,896
Micropterus salmoides	6	.	.	76	17	8	1	2	.	2	.	.	112
Monacanthus hispidus	.	.	1	10	7	10	2	1	2	.	3	.	36
Mugil cephalus	473	2,569	611	202	74	292	129	101	1,249	52	211	428	6,391
Mugil curema	7	71	4	81	56	142	74	37	203	49	123	232	1,079
Mycteroperca microlepis	.	.	.	.	.	.	.	.	1	.	.	.	1
Myrophis punctatus	2	1	1	.	1	5	1	.	.	.	1	.	12
Negaprion brevirostris	.	.	.	.	.	.	1	.	.	.	.	.	1
Notemigonus crysoleucas	1	.	.	.	.	.	.	.	.	.	.	.	1
Noturus gyrinus	1	.	.	.	.	.	.	.	.	.	.	.	1
Ogcocephalus spp.	.	.	.	2	1	.	.	.	.	1	1	.	5
Oligoplites saurus	.	.	.	.	.	12	13	5	9	24	1	.	64
Opisthonema oglinum	1	.	.	18	8	557	124	458	18	2	15	.	1,201
Opsanus tau	5	2	7	13	2	1	9	1	4	.	5	1	50
Orthopristis chrysoptera	.	.	.	172	140	88	67	5	10	2	1	.	485
Paralichthys albigutta	6	11	11	14	7	7	10	4	8	8	.	2	88
Paralichthys dentatus	.	.	.	.	.	.	1	.	1	.	.	.	2
Paralichthys lethostigma	7	7	39	19	12	20	47	12	11	21	5	6	206
Paralichthys spp.	.	.	1	.	.	.	.	.	.	.	.	.	1
Penaeidae spp.	.	.	.	.	.	.	.	.	.	1	.	.	1
Peprilus alepidotus	.	.	.	1	.	.	11	.	1	1	.	.	14
Peprilus spp.	.	.	3	.	.	.	.	.	.	.	.	2	5
Poecilia latipinna	.	.	.	.	.	.	.	3	28	.	.	3	34
Pogonias cromis	4	.	2	.	4	.	7	6	19	16	11	19	88
Pomatomus saltatrix	.	2	24	4	11	6	4	4	.	4	2	.	61
Pomoxis nigromaculatus	.	.	1	.	.	.	.	.	.	.	1	.	2

Appendix JX02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=80	E=80	E=79	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=959
Prionotus scitulus	.	.	2	13	15	18	10	4	9	2	2	.	75
Prionotus tribulus	3	5	25	19	9	6	4	2	3	4	8	3	91
Rachycentron canadum	.	.	.	.	.	.	2	.	.	.	.	.	2
Rhinobatos lentiginosus	.	.	.	.	.	.	.	.	1	.	.	.	1
Rhinoptera bonasus	.	.	.	1	.	1	.	1	.	1	.	.	4
Sciaenidae spp.	.	.	.	.	.	2	.	.	.	.	.	3	5
Sciaenops ocellatus	28	19	16	6	33	2	9	12	20	29	22	21	217
Scomberomorus maculatus	.	.	3	23	15	16	53	1	12	5	.	.	128
Selene vomer	.	.	.	.	1	8	13	6	2	8	2	2	42
Sphoeroides nephelus	5	2	3	7	6	33	24	2	11	14	4	7	118
Sphyraena barracuda	.	.	.	.	.	.	1	1	2	1	.	.	5
Sphyraena borealis	.	.	.	1	.	1	2	.	.	.	.	.	4
Sphyrna tiburo	.	.	.	.	1	2	5	3	1	2	.	.	14
Stellifer lanceolatus	4	10	.	1	.	4,071	343	6	133	54	15	39	4,676
Stomolophus meleagris	45	6	19	22	4	3	.	.	.	1,243	28	207	1,577
Strongylura marina	2	1	1	10	9	18	3	1	7	4	9	6	71
Strongylura notata	.	.	.	.	.	.	.	4	.	.	.	.	4
Strongylura spp.	.	.	.	.	.	7	.	2	.	.	.	.	9
Strongylura timucu	.	.	.	2	5	1	1	.	1	.	.	.	10
Symphurus plagiusa	28	16	73	46	12	84	30	30	101	42	100	29	591
Syngnathus floridae	.	.	.	.	2	3	.	.	1	.	.	.	6
Syngnathus fuscus	.	1	2	1	.	.	.	.	.	.	1	1	6
Syngnathus louisianae	2	.	5	5	6	28	12	2	8	4	.	1	73
Syngnathus scovelli	2	.	2	7	12	2	18	9	4	7	.	.	63
Synodus foetens	2	2	1	2	15	21	18	6	7	2	4	2	82
Trachinotus carolinus	.	.	.	4	60	120	8	97	53	28	1	.	371

Appendix JX02-01. (Continued)

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=80	E=80	E=79	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=80	E=959
Trachinotus falcatus	.	.	.	.	5	7	3	9	5	17	12	.	58
Trichiurus lepturus	.	.	.	2	.	.	1	1	.	.	.	.	4
Trinectes maculatus	144	81	42	122	5	16	8	35	32	78	93	48	704
Urophycis floridana	.	.	3	.	.	.	.	.	.	.	.	.	3
Totals	**8,552**	**7,461**	**8,655**	**9,607**	**18,943**	**36,851**	**35,325**	**20,357**	**12,919**	**17,796**	**11,951**	**9,953**	**198,370**

Appendix JX02-02. Summary by gear, stratum, and zone of species collected during Northeast Florida stratified-random sampling, 2002. 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	
	E=384	E=192	E=383	E=240	E=238	E=241	E=123	E=117	E=959
Achirus lineatus	7	15	36	13	14	24	7	.	58
Aetobatis narinari	.	2	.	.	1	1	.	.	2
Alosa aestivalis	2	.	.	2	.	.	.	.	2
Alosa mediocris	.	1	.	.	.	.	1	.	1
Aluterus monoceros	.	1	.	.	.	1	.	.	1
Ameiurus catus	2	16	126	4	25	23	38	54	144
Ameiurus nebulosus	.	13	3	.	.	.	.	16	16
Anchoa hepsetus	21,565	.	287	4,799	3,314	8,801	4,773	165	21,852
Anchoa mitchilli	62,522	.	14,746	29,753	15,849	24,689	4,845	2,132	77,268
Anchoa nasuta	17	.	4	16	1	4	.	.	21
Anchoa spp.	173	.	38	48	2	161	.	.	211
Ancylopsetta quadrocellata	.	4	10	9	2	3	.	.	14
Anguilla rostrata	1	.	.	.	1	.	.	.	1
Archosargus probatocephalus	14	214	28	44	69	106	24	13	256
Arius felis	.	28	16	23	12	9	.	.	44
Astroscopus y-graecum	.	3	3	.	4	1	1	.	6
Bagre marinus	.	10	7	5	11	1	.	.	17
Bairdiella chrysoura	2,129	411	236	899	1,381	421	54	21	2,776
Bathygobius soporator	8	.	.	.	6	2	.	.	8
Bothidae spp.	1	.	.	1	.	.	.	.	1
Brevoortia spp.	102	5,587	4	530	1,120	3,993	8	42	5,693
Callinectes sapidus	330	241	597	420	438	178	85	47	1,168
Caranx hippos	5	90	.	26	41	21	1	6	95
Caranx latus	1	2	.	.	1	1	1	.	3
Centropomus undecimalis	1	2	.	.	1	2	.	.	3
Centropristis philadelphica	.	.	13	11	.	2	.	.	13
Centropristis striata	.	.	1	1	.	.	.	.	1
Chaetodipterus faber	16	49	71	38	85	12	1	.	136
Chasmodes bosquianus	3	.	3	.	5	1	.	.	6
Chilomycterus schoepfi	45	90	28	86	14	61	2	.	163
Chloroscombrus chrysurus	11	226	68	40	40	225	.	.	305
Citharichthys macrops	.	1	.	.	.	1	.	.	1
Citharichthys spilopterus	110	85	187	132	101	106	18	25	382
Citharichthys spp.	4	.	.	.	4	.	.	.	4

Appendix JX02-02. (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	
	E=384	E=192	E=383	E=240	E=238	E=241	E=123	E=117	E=959
Cynoscion nebulosus	139	225	12	118	120	96	32	10	376
Cynoscion regalis	15	15	651	440	113	39	56	33	681
Cyprinodon variegatus	16	.	.	.	7	9	.	.	16
Dasyatis sabina	26	1,024	86	441	352	219	54	70	1,136
Dasyatis say	.	53	7	36	17	7	.	.	60
Diapterus auratus	12	35	9	10	13	29	4	.	56
Dorosoma cepedianum	3	41	1	1	8	5	14	17	45
Dorosoma petenense	.	14	.	2	1	10	.	1	14
Elops saurus	18	191	15	50	56	89	11	18	224
Etropus crossotus	46	90	361	348	94	54	1	.	497
Eucinostomus argenteus	1	.	.	.	1	.	.	.	1
Eucinostomus gula	39	25	20	19	25	34	6	.	84
Eucinostomus harengulus	625	33	194	101	108	317	166	160	852
Eucinostomus spp.	1,555	.	174	163	641	678	198	49	1,729
Farfantepenaeus aztecus	70	4	112	78	36	14	52	6	186
Farfantepenaeus brasiliensis	.	.	1	1	.	.	.	.	1
Farfantepenaeus duorarum	430	26	437	241	279	246	94	33	893
Farfantepenaeus spp.	70	.	47	3	63	50	.	1	117
Fundulus heteroclitus	4,997	.	3	3,298	566	1,135	1	.	5,000
Fundulus majalis	203	.	.	58	40	104	.	1	203
Fundulus seminolis	16	1	.	.	.	.	.	17	17
Gambusia holbrooki	110	.	.	4	91	3	8	4	110
Gobiesox strumosus	3	.	5	2	5	1	.	.	8
Gobiidae spp.	.	.	1	1	.	.	.	.	1
Gobioides broussoneti	.	.	1	.	.	.	1	.	1
Gobionellus boleosoma	115	.	19	16	32	64	19	3	134
Gobionellus oceanicus	2	.	6	1	1	6	.	.	8
Gobionellus shufeldti	10	.	2	3	1	.	1	7	12
Gobionellus smaragdus	7	.	32	1	3	35	.	.	39
Gobionellus spp.	3	.	.	.	.	.	3	.	3
Gobionellus stigmaticus	.	.	1	.	.	1	.	.	1
Gobiosoma bosc	53	.	22	13	5	39	8	10	75
Gobiosoma robustum	9	.	3	.	5	4	2	1	12
Gobiosoma spp.	67	.	6	3	4	33	3	30	73
Gymnura micrura	1	42	21	19	42	3	.	.	64
Harengula jaguana	4	1	.	1	2	2	.	.	5

Appendix JX02-02. (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	
	E=384	E=192	E=383	E=240	E=238	E=241	E=123	E=117	E=959
Hippocampus erectus	.	.	2	2	.	.	.	.	2
Hyporhamphus meeki	.	1	.	.	1	.	.	.	1
Hypsoblennius hentzi	2	1	.	2	1	.	.	.	3
Ictalurus punctatus	1	57	33	.	6	.	24	61	91
Labidesthes sicculus	108	.	1	.	.	.	5	104	109
Lagodon rhomboides	318	651	54	177	117	543	82	104	1,023
Larimus fasciatus	.	.	68	64	4	.	.	.	68
Leiostomus xanthurus	1,729	904	288	827	515	779	284	516	2,921
Lepisosteus osseus	1	76	.	31	32	.	2	12	77
Lepisosteus platyrhincus	1	25	.	.	1	.	12	13	26
Lepomis auritus	28	20	.	.	.	.	1	47	48
Lepomis macrochirus	95	145	17	.	.	.	31	226	257
Lepomis microlophus	29	83	4	.	.	.	7	109	116
Lepomis punctatus	21	6	.	.	.	.	21	6	27
Lepophidium brevibarbe	.	.	7	3	1	3	.	.	7
Limulus polyphemus	.	4	11	11	3	1	.	.	15
Litopenaeus setiferus	7,136	236	2,064	2,474	4,575	1,523	552	312	9,436
Lobotes surinamensis	.	2	.	.	2	.	.	.	2
Lucania parva	43	.	.	.	.	1	1	41	43
Lutjanidae spp.	.	.	1	.	1	.	.	.	1
Lutjanus analis	1	.	.	.	1	.	.	.	1
Lutjanus griseus	44	15	5	13	38	10	2	1	64
Lutjanus spp.	2	.	.	2	.	.	.	.	2
Lutjanus synagris	9	4	8	9	9	3	.	.	21
Membras martinica	1,791	.	4	1,550	140	100	3	2	1,795
Menidia menidia	25,195	.	.	4,695	5,225	15,185	87	3	25,195
Menidia spp.	8,880	.	.	2,045	3,380	1,898	507	1,050	8,880
Menippe spp.	2	2	10	9	1	3	1	.	14
Menticirrhus americanus	37	25	458	165	283	72	.	.	520
Menticirrhus littoralis	72	3	3	5	71	2	.	.	78
Menticirrhus saxatilis	1	3	8	2	4	5	1	.	12
Microgobius gulosus	167	.	17	7	1	1	33	142	184
Microgobius thalassinus	6	.	68	1	4	69	.	.	74
Micropogonias undulatus	499	112	4,285	1,099	1,231	372	1,244	950	4,896
Micropterus salmoides	100	12	.	.	.	.	7	105	112
Monacanthus hispidus	10	.	26	15	10	11	.	.	36

Appendix JX02-02. (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	
	E=384	E=192	E=383	E=240	E=238	E=241	E=123	E=117	E=959
Mugil cephalus	3,337	3,052	2	2,379	915	1,187	1,201	709	6,391
Mugil curema	373	674	32	419	276	334	13	37	1,079
Mycteroperca microlepis	1	.	.	.	.	1	.	.	1
Myrophis punctatus	4	.	8	6	.	1	5	.	12
Negaprion brevirostris	.	1	.	1	.	.	.	.	1
Notemigonus crysoleucas	1	.	.	.	.	1	.	.	1
Noturus gyrinus	.	.	1	.	.	.	.	1	1
Ogcocephalus spp.	.	1	4	1	3	1	.	.	5
Oligoplites saurus	62	2	.	10	15	28	11	.	64
Opisthonema oglinum	826	374	1	59	115	911	115	1	1,201
Opsanus tau	9	7	34	14	20	14	2	.	50
Orthopristis chrysoptera	340	61	84	127	69	278	11	.	485
Paralichthys albigutta	40	23	25	37	25	25	1	.	88
Paralichthys dentatus	.	1	1	1	.	1	.	.	2
Paralichthys lethostigma	33	111	62	56	64	40	13	33	206
Paralichthys spp.	.	.	1	.	.	1	.	.	1
Penaeidae spp.	.	.	1	.	.	.	1	.	1
Peprilus alepidotus	.	9	5	7	7	.	.	.	14
Peprilus spp.	.	3	2	3	.	2	.	.	5
Poecilia latipinna	34	.	.	.	31	3	.	.	34
Pogonias cromis	9	70	9	29	24	30	5	.	88
Pomatomus saltatrix	7	54	.	37	18	6	.	.	61
Pomoxis nigromaculatus	.	.	2	.	.	.	.	2	2
Prionotus scitulus	14	4	57	50	13	10	2	.	75
Prionotus tribulus	11	16	64	56	20	15	.	.	91
Rachycentron canadum	.	2	.	1	1	.	.	.	2
Rhinobatos lentiginosus	.	.	1	1	.	.	.	.	1
Rhinoptera bonasus	.	4	.	3	.	1	.	.	4
Sciaenidae spp.	2	.	3	.	2	3	.	.	5
Sciaenops ocellatus	88	122	7	33	16	122	14	32	217
Scomberomorus maculatus	20	108	.	46	49	33	.	.	128
Selene vomer	3	23	16	15	17	10	.	.	42
Sphoeroides nephelus	20	46	52	37	31	42	8	.	118
Sphyraena barracuda	.	4	1	1	.	4	.	.	5
Sphyraena borealis	2	.	2	.	2	2	.	.	4
Sphyrna tiburo	.	14	.	8	6	.	.	.	14

Appendix JX02-02. (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	
	E=384	E=192	E=383	E=240	E=238	E=241	E=123	E=117	E=959
Stellifer lanceolatus	.	7	4,669	4,388	221	43	19	5	4,676
Stomolophus meleagris	18	1,422	137	129	13	1,433	2	.	1,577
Strongylura marina	39	32	.	13	9	25	6	18	71
Strongylura notata	4	.	.	.	.	.	.	4	4
Strongylura spp.	9	.	.	1	1	.	6	1	9
Strongylura timucu	7	3	.	5	5	.	.	.	10
Symphurus plagiusa	313	3	275	266	243	64	18	.	591
Syngnathus floridae	4	.	2	2	.	.	3	1	6
Syngnathus fuscus	.	.	6	5	1	.	.	.	6
Syngnathus louisianae	54	.	19	31	11	11	18	2	73
Syngnathus scovelli	50	.	13	3	14	2	16	28	63
Synodus foetens	37	3	42	36	20	23	3	.	82
Trachinotus carolinus	310	61	.	133	178	60	.	.	371
Trachinotus falcatus	47	11	.	23	31	4	.	.	58
Trichiurus lepturus	.	1	3	2	.	2	.	.	4
Trinectes maculatus	29	1	674	37	134	86	333	114	704
Urophycis floridana	.	.	3	3	.	.	.	.	3
Totals	**148,219**	**17,628**	**32,523**	**64,094**	**43,550**	**67,616**	**15,326**	**7,784**	**198,370**

Directed Sampling

Introduction

The Fisheries-Independent Monitoring (FIM) program conducted a seasonal directed sampling project for striped mullet (*Mugil cephalus*) in Tampa Bay and Charlotte Harbor. Data obtained from directed sampling were used cooperatively by a number of Florida Marine Research Institute (FMRI) research groups, including Fisheries Stock Assessment and Fish Biology, to provide stock assessments on this species. The objectives of directed sampling were to determine the size, age, and sex composition of localized populations of striped mullet in select Florida estuaries. This report summarizes data collected from January 1 to February 14, 2002 and from September 15 to December 31, 2002.

Methods

Tampa Bay. Directed sampling for striped mullet was conducted in Tampa Bay using a 366-m monofilament trammel net with 308-mm stretch outer mesh and 71-mm stretch inner mesh. The net was set on visually-detected schools of mullet in water <3 m deep. Fish collected from January to February 2002 were considered part of the 2001 sampling season's data, while fish collected from September through December 2002 represented part of the 2002 sampling season. The study period was divided into five 4-week sampling windows (September 15-October 14, October 15-November 14, November 15-December 14, December 15-January 14, and January 15-February 14), with at least two days of sampling being conducted within each window.

During each sampling window, two primary and two secondary sampling areas were assigned (one primary and one secondary area on the east and west sides of the bay) from the six possible sampling zones (Figure DR02-01). Primary sampling areas were searched for a maximum of two hours or until at least 200 striped mullet had been measured and 50 fish culled (for age and sex determination-). Secondary areas were sampled only if the minimum number of mullet were not collected in the primary areas. Additional sampling days were added as necessary to procure the required amount of culled (100 fish retained for age and sex determination) and measured mullet (400 fish) per sampling window. To increase the probability of successful collections, primary zones were non-randomly selected because striped mullet were generally found in the upper reaches of estuaries prior to the spawning season and moved closer to the mouth of the bay as the spawning season progressed. Therefore, sampling was directed toward upper areas of Tampa Bay early in the season and shifted to lower Tampa Bay later in the winter season.

Charlotte Harbor. A similar sampling design and collection method was used in Charlotte Harbor. The sampling period was divided into four 4-week sampling windows (October 15-November 14, November 15-December 14, December 15-January 14, and January 15-February 14). Fall 2002 sampling was conducted from October 15 to December 31. For analysis purposes, sampling conducted from January 1, 2002 to February 14, 2002 was considered part of the 2001 sampling season.

During each sampling window, two primary and two secondary sampling areas were assigned (one primary and one secondary area on the north and south sides of the harbor) from the four possible sampling zones (Figure DR02-02). Additional sampling days were added as necessary to procure the required amount of culled (160 fish retained for age and sex composition) and measured mullet (400 fish) per sampling window.

Results and Discussion

Tampa Bay. A total of 3,334 striped mullet were collected during 23 sampling trips (77 net sets) in 2002 (Table DR02-01). For the fall 2002 season (Sept.-Dec.), a total of 1,808 striped mullet were collected from 13 trips and 48 hauls (Table DR02-02). Striped mullet were collected throughout all months of the fall survey. Although striped mullet were collected in most sampling zones, the greatest number was collected in the west/north zone (n=665, 36.8%). None were collected in the east/mid zone this season (Table DR02-02, Figure DR02-01). In the 2002 fall season, striped mullet lengths ranged from 225 to 565 mm fork length (FL) with a single mode occurring at 355 mm FL (Figure DR02-03).

Charlotte Harbor. A total of 23 sampling trips occurred during 2002 (35 net sets), collecting 1,742 striped mullet (Table DR02-01). For the fall 2002 season (Oct.-

Dec.), a total of 901 striped mullet were collected from 14 trips and 20 hauls. The majority (n=498, 55.3%) of striped mullet were collected in the southeast zone (Table DR02-02; Figure DR02-02). Mullet lengths during the fall 2002 season ranged from 225 to 575 mm FL (Figure DR02-03).

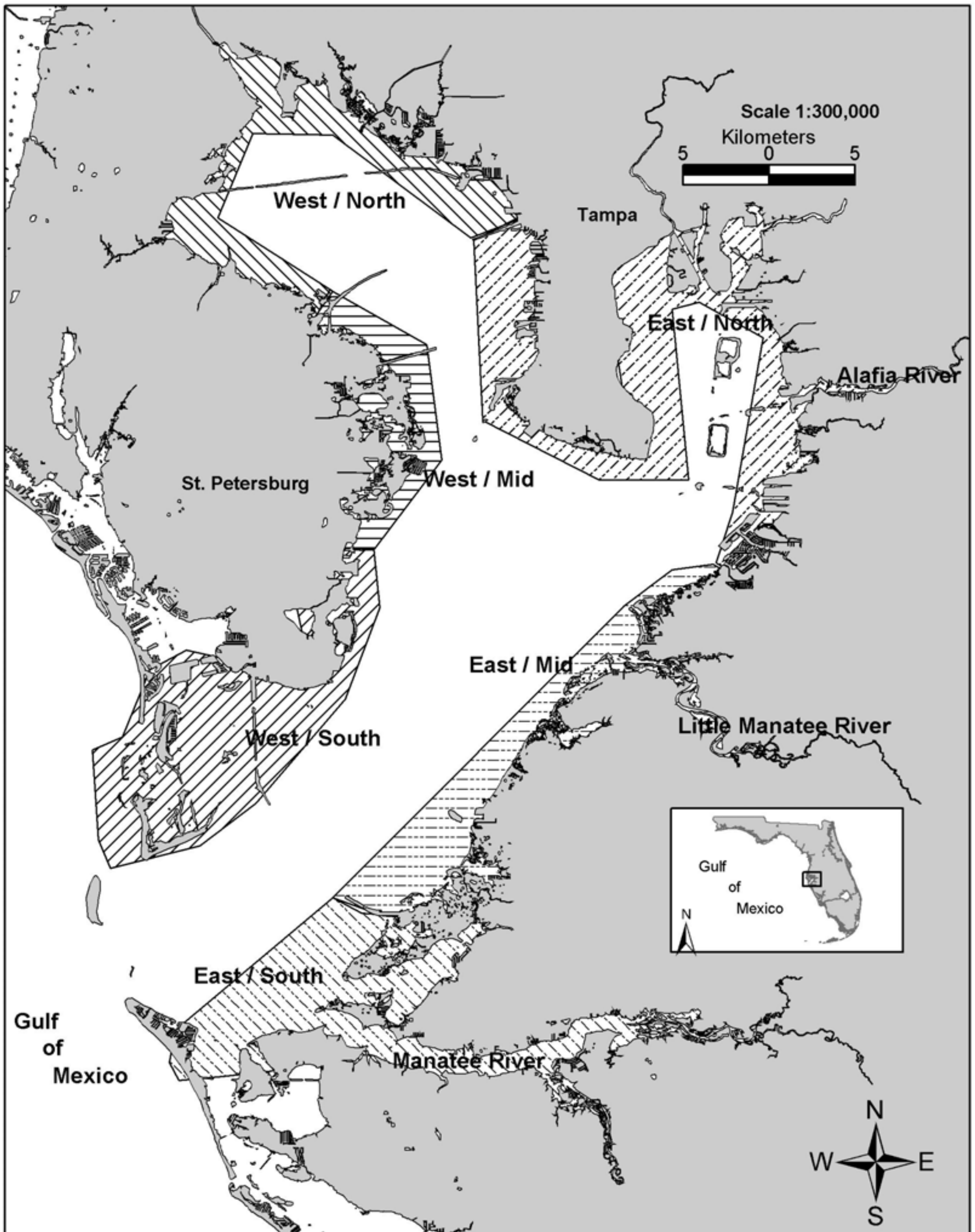

Figure DR02-01. Map of striped mullet sampling areas in Tampa Bay.

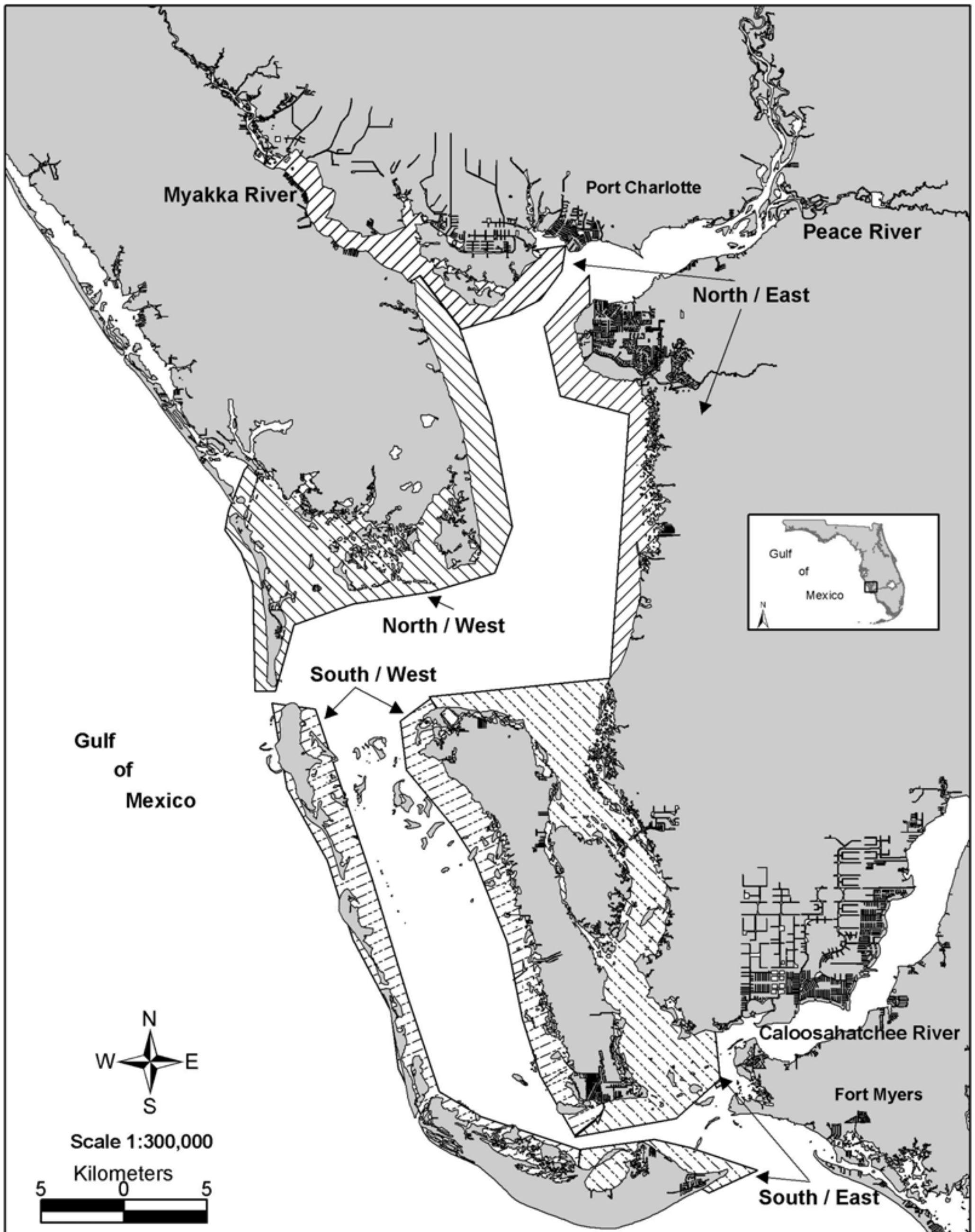

Figure DR02-02. Map of striped mullet sampling areas in Charlotte Harbor.

Table DR02-01. Summary of effort and catch data for directed striped mullet sampling in Tampa Bay and Charlotte Harbor, 2002. Collections for the 2002 sampling season were initiated in mid-October for Charlotte Harbor. Number of Trips denotes the number of times a sampling area was visited.

Sampling Period	Tampa Bay			Charlotte Harbor		
	No. of Trips	No. of Hauls	No. of Mullet	No. of Trips	No. of Hauls	No. of Mullet
January 1 – 14*	1	2	98	3	5	370
January 15 – February 14*	9	27	1,428	6	10	471
September 15 – October 14	2	7	423	-	-	-
October 15 – November 14	4	14	721	5	12	424
November 15 – December 14	4	11	192	7	7	470
December 15 – 31	3	16	472	2	1	7
Sub-Total (Jan. – Feb.)	**10**	**29**	**1,526**	**9**	**15**	**841**
Sub-Total (Sept. – Dec.)	**13**	**48**	**1,808**	**14**	**20**	**901**
Grand Total(2002 Calendar Year)	**23**	**77**	**3,334**	**23**	**35**	**1,742**

* Fish collected in Jan. – Feb., 2002 were treated as part of the 2001 sampling season.

Table DR02-02. Striped mullet sampling and capture locations in Tampa Bay and Charlotte Harbor, fall 2002. Sampling areas are defined in Figures DR02-01 and DR02-02. Number of trips denotes the number of times the sampling areas were visited.

Bay	Sampling Area	No. of Trips	No. of Hauls	No. of Mullet
Tampa Bay	West/North: Old Tampa Bay south to Howard Franklin Bridge	3	11	665
	West/Mid: Howard Franklin Bridge south to St. Pete Pier	2	7	146
	West/South: St. Pete Pier south to Mullet Key	1	1	37
	East/North: Hillsborough Bay south to Apollo Beach	3	9	650
	East/Mid: Apollo Beach south to Piney Point	1	0	0
	East/South: Piney Point south to Manatee River	3	20	310
Charlotte Harbor	North/East: Myakka River south to Burnt Store	3	3	65
	North/West: Bull Bay/Turtle Bay	6	10	321
	South/East: Burnt Store south to Matlacha Pass	4	6	498
	South/West: south of Boca Grande Pass, including Pine Island Sound to York Island	1	1	17

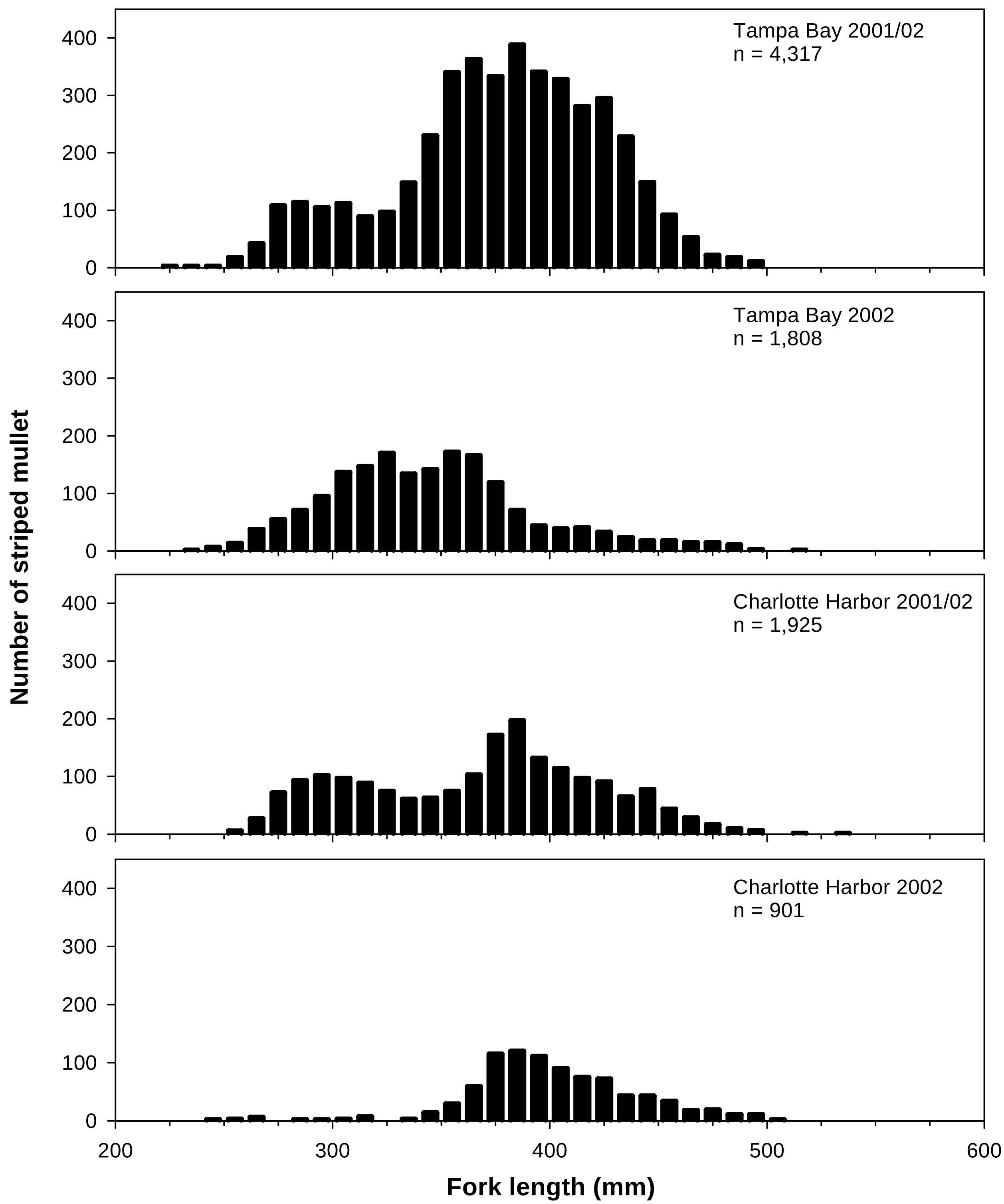

Figure DR02-03. Size distributions of striped mullet collected during trammel net surveys inTampa Bay and Charlotte Harbor, 2001-2002. The 2001/02 graphs represent striped mullet collected from September 2001 to February 2002. The 2002 graphs represent striped mullet collected from September 2002 to December 2002.

Fish Health Monitoring

Introduction

Long-term, multi-gear, and multi-habitat sampling approach of fisheries-independent monitoring programs not only provides stock information to fisheries managers, but also helps 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). This influx of nutrients and other materials commonly associated with 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 occurrence of certain diseases in fish continues to accumulate (Sinderman 1979). The incidence of gross external abnormalities in marine species, defined as those illnesses or deformations easily observed in the field, provides valuable information on the level of environmental stress placed on species in estuarine and coastal waters (Fournie et al. 1996). Baseline information on the frequency of occurrence of external abnormalities is necessary to monitor changes in the ecological health of Florida's estuaries, particularly when attempting to correlate specific fish kills to ecosystem degradation.

In April 1998, the Florida Marine Research Institute's (FMRI) Fisheries-Independent Monitoring (FIM) program began to document gross external abnormalities (including parasites) of fish and select invertebrates in Florida's estuaries. The main objectives of the fish health monitoring component of the FIM program are to categorize prominent types of gross external abnormalities observed, document which species are most susceptible, and document normal background levels of fish health problems. This report summarizes the occurrence of gross external abnormalities in fish and select invertebrates collected primarily from adult stratified-random sampling (SRS) in select Florida estuaries from January to December 2002.

Methods

Fish health monitoring was conducted in all estuarine waters sampled by the FIM program. Methods for fish health monitoring in the Florida Keys were finalized in June of 2002 and fish health monitoring was integrated into their sampling design (FIM Procedure Manual 2002). In all study locations, affected specimens were identified and recorded from all gear types, but only specimens $\geq$75 mm standard length (SL) were actively examined for external abnormalities. Some abnormalities were opportunistically observed for fish < 75 mm SL and these occurrences were also recorded. Affected specimens were assigned a "Fish Health Code" (FHC) in the field by FIM program staff, packed on ice and returned to the lab. These specimens were sent to the FMRI's Aquatic Health Group (AHG) in St. Petersburg for detailed diagnosis. Specimens from other field labs were either fixed in 10% Formalin or shipped on ice to the AHG. After evaluation, the AHG assigned an Aquatic Health Code (AHC) to each specimen and provided this data to the FIM program for input into a database. The following codes were used:

B	Red or bloody areas (no scale loss)
E	Scale loss or erosion (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	Raised area (tumor, cyst)
U	Ulcer or lesion (muscle tissue affected)
O	Other (condition not specifically listed)
P	Parasitic infestation

For the purposes of this report, the assigned FHC and its corresponding AHC were compared to produce a final "Health Code" (HC), which was used for all data analysis. In those instances when fish were not returned to the fish pathologist and therefor, not assigned an AHC, the HC was determined according to the FHC assigned. In instances where specimens were returned to the fish pathologist and the FHC and the AHC differed, the HC was assigned the AHC. In all other instances when the FHC and the AHC assigned agreed, the HC was the same.

Results and Discussion

A total of 297,774 fish and select invertebrates ≥ 75 mm SL were collected during FIM program sampling in 2002 (Table FH02-01). Of these fish and select invertebrates, 170 specimens (0.06%) had gross external abnormalities. Northeast Florida had the highest percent occurrence of affected specimens collected (0.15%), whereas Cedar Key had the lowest occurrence of affected specimens collected (0.02%). Of the fish observed *M. cephalus and Brevoortia* spp. occurred most frequently with gross external abnormalities (n=42 and 40, respectively). *Mugil cephalus* were collected from six field labs, whereas *Brevoortia* spp. was collected from only three field labs. Parasitic infestation was the dominant abnormality observed from all species (n=59, 35%) but was only detected from four of the field labs. Ulcers (37 specimens) were observed in all field labs except Cedar Key and the Keys.

Incidence by Lab

Apalachicola Bay: Apalachicola staff collected 35,722 fish ≥75 mm SL (Table FH02-01). Sixteen of these fish (0.04%), belonging to 10 taxa, had gross external abnormalities (Table FH02-02). The most common abnormality was the presence of parasites (n=7, 43.8%).

Cedar Key: Cedar Key staff collected 38,229 fish ≥ 75 mm SL (Table FH02-01). Eight of these fish (0.02%), belonging to six taxa, had gross external abnormalities (Table FH02-03). The most common deformity observed was fin rot and skeletal irregularities (HC=F and S, n=3; respectively).

Charlotte Harbor: Charlotte Harbor staff collected 58,327 fish ≥ 75 mm SL (Table FH02-01). Thirty-nine of these fish (0.07%), belonging to six taxa, had gross external abnormalities (Table FH02-04). Parasitic infestation was the most prominent external abnormality observed (n=27, 69%) and mainly affected *Brevoortia* spp. (n=26).

Northern Indian River Lagoon: Indian River staff collected 33,942 fish ≥75 mm SL (Table FH02-01). Twenty-eight of these fish (0.08%), belonging to 11 taxa, had gross external abnormalities (Table FH02-05). The most common abnormalities observed were skeletal irregularities including scoliosis and upper jaw deformity (n=11, 39.3%).

Northeast Florida: Jacksonville staff collected 19,416 fish ≥ 75 mm SL (Table FH02-01). Thirty of these fish (0.15%), belonging to eight taxa, had gross external abnormalities (Table FH02-06). Half of the abnormalities observed were ulcers (n=15), affecting *M. cephalus* (n= 9) the most.

Florida Keys**:** Florida Keys staff collected 2,284 fish ≥ 75 mm. None of these fish had any observed gross external abnormalities. During directed snapper sampling from January through April Keys staff observed *Ocyurus chrysurus* (frequency of occurrence= 0.07%), *Lutjanus synagris* (frequency of occurrence= 0.06%), and *Lutjanus analis* (frequency of occurrence= 0.02%) with parasitized gonads.

Tampa Bay: Tampa Bay staff collected 91,786 fish ≥75 mm SL (Table FH02-01). Thirty-nine of these fish (0.04%), belonging to 20 taxa, were observed with gross external abnormalities (Table FH02-07). Parasitic infestation (n=24, 61.5%), primarily associated with *Brevoortia* spp. (n=10), was the most common abnormality observed.

Southern Indian River Lagoon: Tequesta staff collected 18,068 fish ≥ 75 mm SL (Table FH02-01). Ten of these fish (0.06%), belonging to six taxa, were observed with abnormalities (Table FH02-08). Ulcers were the most common abnormality (n=5, 50%) predominately affecting *Mugil* spp. (n=3).

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Table FH02-01. Incidence of external abnormalities in fish collected during stratified-random sampling at each FIM field lab during 2002. Data are based only on fish $\geq$ 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	35,722	16	0.04
Cedar Key	38,229	8	0.02
Charlotte Harbor	58,327	39	0.07
N. Indian River Lagoon	33,942	28	0.08
Northeast Florida	19,416	30	0.15
Florida Keys	2,284	.	.
Tampa Bay	91,786	39	0.04
S. Indian River Lagoon	18,068	10	0.06
Totals	297,774	170	0.06

Table FH02-02. Alphabetical list of taxa having gross external abnormalities collected in Apalachicola Bay during stratified-random sampling, 2002. 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	Percent Affected
Archosargus probatocephalus	149	1	.	.	.	1	.	.	.	.	0.67
Arius felis	954	3	3	.	.	.	.	.	.	.	0.31
Bairdiella chrysoura	3,751	1	1	.	.	.	.	.	.	.	0.03
Fundulus grandis	52	1	.	.	.	.	.	1	.	.	1.92
Lagodon rhomboides	9,354	1	.	.	.	.	.	.	1	.	0.01
Leiostomus xanthurus	3,793	3	2	.	.	.	.	.	1	.	0.08
Lepisosteus osseus	11	1	1	.	.	.	.	.	.	.	9.09
Menticirrhus americanus	108	2	.	.	1	.	.	1	.	.	1.85
Micropogonias undulatus	1,652	2	.	.	.	1	.	.	1	.	0.12
Orthopristis chrysoptera	1,032	1	.	.	.	1	.	.	.	.	0.1
Totals	.	16	7	.	1	3	.	2	3	.	.

* 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 or cyst; O = other

Table FH02-03. Alphabetical list of taxa having gross external abnormalities collected in Cedar Key during stratified-random sampling, 2002. 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	Percent Affected
Cynoscion arenarius	497	2	.	.	2	.	.	.	.	.	0.4
Leiostomus xanthurus	2,625	1	.	.	.	.	.	1	.	.	0.04
Mugil cephalus	1,882	2	.	1	.	.	.	1	.	.	0.11
Mugil curema	119	1	.	.	1	.	.	.	.	.	0.84
Mugil gyrans	102	1	1	.	.	.	.	.	.	.	0.98
Orthopristis chrysoptera	1,497	1	.	.	.	.	.	1	.	.	0.07
Totals	.	8	1	1	3	.	.	3	.	.	.

* 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 or cyst; O = other

Table FH02-04. Alphabetical list of taxa having gross external abnormalities collected in Charlotte Harbor during stratified-random sampling, 2002. 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	Percent Affected
Arius felis	626	1	.	.	.	1	.	.	.	.	0.16
Brevoortia spp.	168	28	26	.	2	.	.	.	.	.	16.67
Centropomus undecimalis	904	1	.	1	.	.	.	.	.	.	0.11
Cynoscion nebulosus	367	1	.	.	.	.	.	.	.	1	0.27
Mugil cephalus	1,972	7	.	.	.	6	.	.	1	.	0.35
Strongylura notata	309	1	1	.	.	.	.	.	.	.	0.32
Totals	.	39	27	1	2	7	.	.	1	1	.

* 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 or cyst; O = other

Table FH02-05. Alphabetical list of taxa having gross external abnormalities collected in the Northern Indian River Lagoon during stratified-random sampling, 2002. 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	Percent Affected
Archosargus probatocephalus	846	3	.	.	.	.	.	3	.	.	0.35
Arius felis	979	2	.	.	.	1	.	1	.	.	0.2
Caranx hippos	357	1	.	.	.	.	.	.	1	.	0.28
Chaetodipterus faber	90	1	.	.	.	1	.	.	.	.	1.11
Diapterus auratus	2,407	1	.	.	1	.	.	.	.	.	0.04
Lagodon rhomboides	16,098	5	.	.	.	.	.	3	.	2	0.03
Mugil cephalus	1,698	7	.	.	5	1	1	.	.	.	0.41
Pogonias cromis	144	2	.	.	.	.	1	1	.	.	1.39
Sciaenops ocellatus	229	1	.	.	.	.	.	1	.	.	0.44
Sphoeroides nephelus	905	3	.	.	.	.	.	2	.	1	0.33
Strongylura notata	376	2	.	.	.	.	.	.	2	.	0.53
Totals	.	28	.	.	6	3	2	11	3	3	.

* 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 or cyst; O = other

Table FH02-06. Alphabetical list of taxa having gross external abnormalities collected in Northeast Florida during stratified-random sampling, 2002. 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	Percent Affected
Archosargus probatocephalus	249	1	.	.	.	.	.	1	.	.	0.4
Bairdiella chrysoura	656	1	.	.	.	1	.	.	.	.	0.15
Brevoortia spp.	5,539	1	.	.	.	1	.	.	.	.	0.02
Dorosoma cepedianum	45	1	.	.	.	1	.	.	.	.	2.22
Micropogonias undulatus	381	1	.	.	.	1	.	.	.	.	0.26
Mugil cephalus	3,170	22	.	11	2	9	.	.	.	.	0.69
Pogonias cromis	88	2	.	1	.	1	.	.	.	.	2.27
Sciaenops ocellatus	141	1	.	.	.	1	.	.	.	.	0.71
Totals	.	30	.	12	2	15	.	1	.	.	.

* 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 or cyst; O = other

Table FH02-07. Alphabetical list of taxa having gross external abnormalities collected in Tampa Bay during stratified-random sampling, 2002. 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	Percent Affected
Archosargus probatocephalus	715	1	.	.	.	.	.	1	.	.	0.14
Arius felis	6,072	1	.	.	.	1	.	.	.	.	0.02
Brevoortia spp.	919	11	10	.	.	1	.	.	.	.	1.2
Callinectes sapidus	870	3	3	.	.	.	.	.	.	.	0.34
Caranx hippos	166	1	1	.	.	.	.	.	.	.	0.6
Centropomus undecimalis	1,754	1	.	.	.	.	.	1	.	.	0.06
Chilomycterus schoepfi	490	2	1	.	.	1	.	.	.	.	0.41
Cynoscion arenarius	446	2	1	.	1	.	.	.	.	.	0.45
Cynoscion nebulosus	557	1	.	.	.	.	.	.	1	.	0.18
Elops saurus	4,163	1	.	.	.	.	.	1	.	.	0.02
Eucinostomus gula	5,044	1	1	.	.	.	.	.	.	.	0.02
Lagodon rhomboides	18,186	4	.	.	.	1	.	3	.	.	0.02
Leiostomus xanthurus	2,149	1	.	.	.	.	.	.	.	1	0.05
Lepisosteus osseus	17	1	1	.	.	.	.	.	.	.	5.88
Menticirrhus americanus	784	2	.	.	.	.	.	2	.	.	0.26
Mugil cephalus	5,051	1	1	.	.	.	.	.	.	.	0.02
Mugil curema	350	2	2	.	.	.	.	.	.	.	0.57
Orthopristis chrysoptera	1,170	1	1	.	.	.	.	.	.	.	0.09
Sciaenops ocellatus	896	1	1	.	.	.	.	.	.	.	0.11
Sphoeroides nephelus	189	1	1	.	.	.	.	.	.	.	0.53
Totals	.	39	24	.	1	4	.	8	1	1	.

* 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 or cyst; O = other

Table FH02-08. Alphabetical list of taxa having gross external abnormalities collected in Southern Indian River Lagoon during stratified-random sampling, 2002. 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	Percent Affected
Archosargus probatocephalus	806	2	.	1	.	1	.	.	.	.	0.25
Arius felis	391	1	.	.	.	1	.	.	.	.	0.26
Caranx hippos	214	1	.	1	.	.	.	.	.	.	0.47
Diapterus auratus	3,960	1	.	.	1	.	.	.	.	.	0.03
Mugil cephalus	606	3	.	1	1	1	.	.	.	.	0.5
Mugil curema	1,148	2	.	.	.	2	.	.	.	.	0.17
Totals	.	10	.	3	2	5	.	.	.	.	.

* 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 or cyst; O = other

Species Profiles

Introduction

An important use of Fisheries-Independent Monitoring (FIM) program data is to track relative abundance of fish stocks and provide information that can be used in species management plans, including information on the abundance of juvenile fish. Juvenile abundance indices measure the relative abundance of newly-recruiting or young-of-the-year (YOY) fish and may be used to describe recruitment processes and forecast population trends. When combined with data on adult fish, a comprehensive picture of the relative condition of a fish population can be constructed. This section provides profiles of species that are routinely collected in FIM program sampling and are of recreational or commercial importance in Florida, including red drum, spotted seatrout, sheepshead, striped mullet, pinfish, and blue crabs.

Similar analyses were used for developing recruitment indices for each species. Data from stratified-random or fixed station sampling were used to assess abundance of newly-recruiting or YOY target species. Study areas included in the analyses were selected based on adequate sample sizes of the target species or years of available data, and separate indices were calculated for each study area. The specific time periods and sizes of specimens included in the analyses varied among species based on 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 typically omitted from the YOY analyses because they were considered not to be YOY. Therefore sub-adult and adult sized fish were analyzed separately.

Annual recruitment or YOY abundance indices were computed using an Analysis of Covariance (ANCOVA) (Sokal and Rohlf 1981; Hilborn and Walters 1992) to reduce spatial and temporal variability between sets. Location, time, and environmental variables were treated as either classification variables (zone, year, month, gear, deployment technique, sediment type, and presence / absence of bottom vegetation) or covariates (water temperature, salinity, and percent cover of bottom vegetation) in the

ANCOVA analyses. The PROC GLM procedure (SAS Institute 1989) was used to complete all ANCOVA analyses. In order to normalize the data, water temperature, salinity, percent bottom vegetation, and number of animals per haul were natural log transformed [ln(X+1)] prior to analysis. Variables, except year, that were not significant at α=0.05 were dropped and the analysis repeated. With the ANCOVA analysis, least squares adjusted means and standard errors were calculated for each year.

Relative abundance was calculated as the median annual number of fish per haul. Median values were determined from the least-squares adjusted means by multiplying the standard error by a random normal deviate (μ=0, σ=1) and adding it to the least-squares mean. These data were then back-transformed (e^x-1). The process was repeated 500 times for each year to create a sampling distribution of back-transformed means. Summary statistics (10, 25, 75, and 90 percentiles) were then calculated (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 both 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 (Goodyear 1987). 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). The current status of Florida's red drum populations is uncertain, as fishing mortality estimates have steadily increased since the early 1990s, and model predictions for age-specific indices have spanned the 30% escapement threshold prescribed by current management (Murphy 2002).

In Florida, adult red drum spawn from mid-August through late November (Yokel 1966). Spawning occurs primarily near bay mouths or inlets and 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 January, with peaks occurring in October and November (Reagan 1985; Peters and McMichael 1987; Daniel 1988). Data collected by the Fisheries-Independent Monitoring (FIM) program from 1989 to 1996 indicated that settlement of juvenile red drum less than 33 mm standard length (SL) typically occurred in the middle or upper reaches of the estuaries away from ocean inlets or passes, and was strongly influenced by the availability of low to moderate salinity habitats (FDEP-FMRI 1996).

In an effort to monitor year-class strength and to improve the ability to predict future adult red drum abundances, the FIM program develops indices of juvenile red drum recruitment for selected Florida estuaries. Data from stratified-random 21.3-m seine samples were examined to assess the recruitment of juvenile red drum in five Florida estuaries: Tampa Bay, Charlotte Harbor, northern Indian River Lagoon, Cedar Key, and Apalachicola Bay. Indices of abundance for juvenile red drum were not calculated for Florida Bay due to the low numbers of fish collected, nor from northeast Florida due to the limited sampling time series available. Historical length-frequency data indicated that red drum less than 40 mm SL recruited to habitats sampled with our 21.3-m seines in these estuaries primarily from October - December (September - December in Cedar Key).

On Florida's southwest coast between 1989 and 2002, median estimates of relative abundance for juvenile red drum followed similar trends in both Tampa Bay and Charlotte Harbor (Figure SP02-01A). During this period, relative abundance estimates generally exhibited only small fluctuations, although there were pronounced increases in abundance estimates in both of these systems in 1995 and 2002. Specific reasons for these increases are currently unknown and may be related to natural recruitment cycles, fluctuations in adult spawning success, or abiotic recruitment-related processes. The fact that similar patterns were observed in these disjunct estuarine systems suggested that red drum recruitment on this section of Florida's Gulf coast may have been influenced by factors which operated over regional scales. On Florida's northwest coast, relative abundances of juvenile red drum in Cedar Key between 1996 and 2002 reached a peak in 1997 and have fluctuated at lower levels through 2002 (Figure SP02-01B). In Apalachicola Bay, estimates of abundance were relatively low and varied without trend between 1998 and 2001, but exhibited an increase in 2002 (Figure SP02-01B).

In the northern Indian River Lagoon on Florida's east coast, relative abundance estimates for juvenile red drum remained stable from 1990-1997, exhibited an apparent increase in 1998, and declined sharply during 1999 (Figure SP02-01C). Beginning in 1998, the sampling area was revised to include some of the more productive juvenile red drum nursery habitats located in the vicinity of the St. Sebastian River, and the increase in relative abundances observed in the

Indian River Lagoon during 1998 may have reflected this shift in sampling emphasis. If so, then the low abundances observed in these same sampling areas during 1999 may actually represent a considerable decline in recruitment success for this year class. Since then, estimates of relative abundance have increased, but have not reached the abundances observed in 1998.

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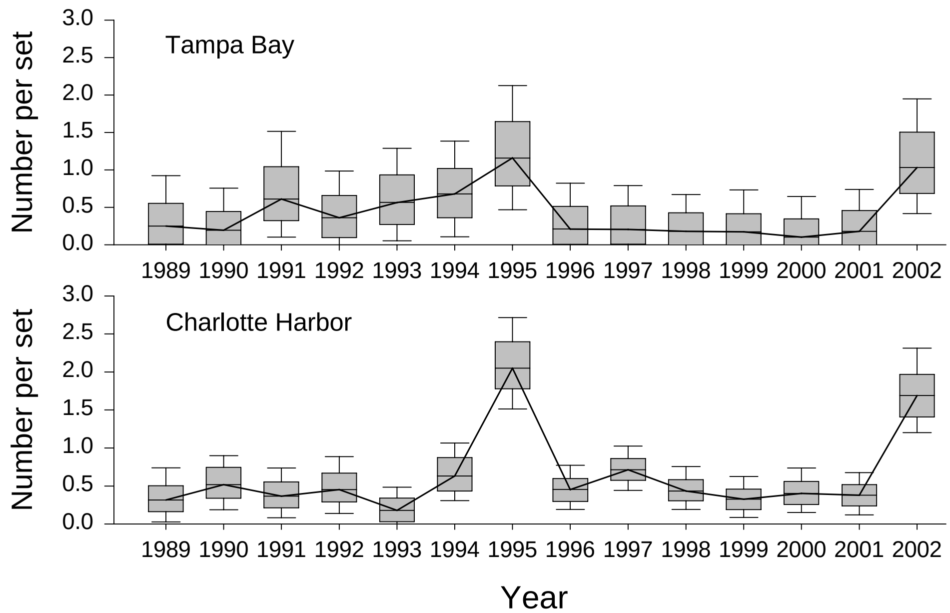
A) Southwest Coast (Gulf of Mexico)



B) Northwest Coast (Gulf of Mexico)

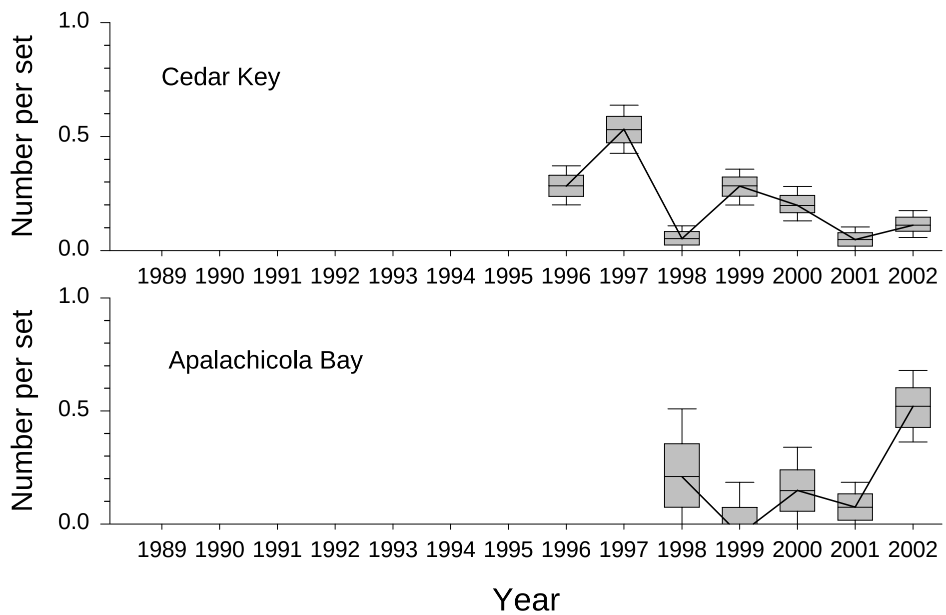


Figure SP02-01. Indices of relative abundance for juvenile red drum (< 40 mm SL) collected in 21.3-m seines during stratified-random sampling between September and January from five Florida estuarine systems located on Florida's **(A)** Southwest Coast, **(B)** Northwest Coast, and **(C)** East Coast between 1989 and 2002. The box represents the 25th – 75th percentiles, the vertical line extends from the 10th – 90th percentiles, and the horizontal line within each box indicates the median estimate. The broken line between 1997 and 1998 for Indian River Lagoon represents the change in sampling universe in this estuary.

C) East Coast (Atlantic Ocean)

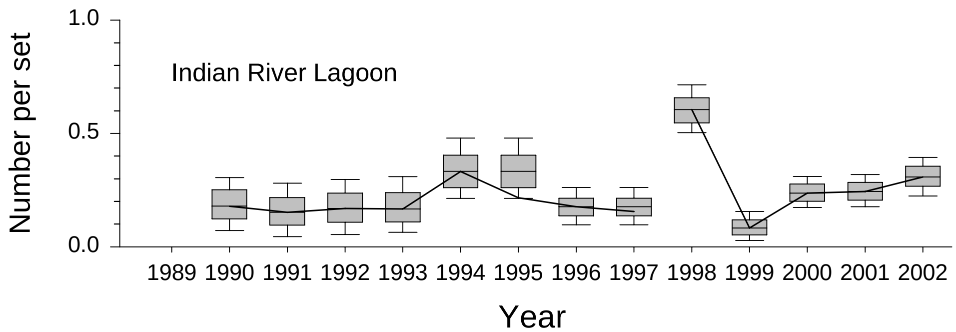


Figure SP02-01 (continued). Indices of relative abundance for juvenile red drum (< 40 mm SL) collected in 21.3-m seines during stratified-random sampling between September and January from five Florida estuarine systems located on Florida's **(A)** Southwest Coast, **(B)** Northwest Coast, and **(C)** East Coast between 1989 and 2002. The box represents the 25th – 75th percentiles, the vertical line extends from the 10th – 90th percentiles, and the horizontal line within each box indicates the median estimate. The broken line between 1997 and 1998 for the Indian River Lagoon represents the change in sampling universe in this estuary.

Spotted Seatrout, *Cynoscion nebulosus*

Spotted seatrout, *Cynoscion nebulosus*, occur in temperate to tropical estuarine waters on the Atlantic and Gulf of Mexico coasts of the United States (Bortone, 2002). In Florida, spotted seatrout have supported economically important recreational and commercial fisheries. Commercial fishing regulations adopted in 1995 that have affected Florida's spotted seatrout fishery include the reduction of entangling nets, a slot limit of 15 – 24 inches, and a 75-fish daily bag limit (Murphy et al., 1999). Regional slot and bag limits were also imposed on the recreational fishery in 1996 (Murphy et al., 1999). With these regulatory changes, the spotted seatrout fishery has moved from what was a mixed–sector fishery with about 20% of the landings made by commercial fishers to an almost exclusive (>95% by weight) recreational fishery (Murphy et al., 2001). Average commercial landings from 1996 – 1998 were only 8% of those from 1990 – 1994, while recreational landings fell by approximately 34% over the same period (Murphy et al., 1999). Standardized total-catch rates (catch per trip) for recreational anglers have been increasing since 1996 on the Gulf Coast, with the exception of a dip in 2000; levels on the Atlantic coast increased in 1990 – 1991 and have fluctuated at these higher levels over the last decade (Murphy et al., 2001).

Adult spotted seatrout begin to spawn in March/April in southwestern Florida estuaries (i.e., Tampa Bay and Charlotte Harbor; McMichael and Peters 1989) and in April/May in the more northerly Florida estuarine areas (i.e., the northern Indian River Lagoon (Tabb, 1961), Cedar Key (Moody, 1950), and Apalachicola Bay (Devries et al., 2002)). Protracted spawning for spotted seatrout continues throughout the summer and into late September or October depending on location (Murphy et al., 1999). Spawning generally occurs during the evening hours in deep channels and depressions near grass flats in saline estuarine areas of water temperature >21°C (Tabb, 1966; Helser et al., 1993). Recruitment of juveniles into estuarine areas is evident from April to October in Tampa Bay and Charlotte Harbor, and later at higher latitudes, lasting from May to November in the Indian River Lagoon and Cedar Key. In the Apalachicola Bay region, young-of-the-year spotted seatrout recruitment does not begin until June, continuing through October (Devries et al., 1997).

The Florida Marine Research Institute's Fisheries-Independent Monitoring (FIM) program's data were used to generate indices of relative abundance (IOA) for young-of-the-year (YOY) and adult spotted seatrout in select Florida estuaries. These data allow us to monitor relative year-class strength, to improve the ability to predict future adult spotted seatrout abundances, and attempt to correlate juvenile abundances with subsequent adult spotted seatrout. Data from stratified-random 21.3-m seine sampling were used to assess the recruitment of juvenile spotted seatrout ($\leq$ 100 mm standard length (SL)) from select estuarine areas (i.e., Tampa Bay (TB), Charlotte Harbor (CH), the northern Indian River Lagoon (IR), Cedar Key (CK), and Apalachicola Bay (AP)). The "recruitment windows" used for examining YOY spotted seatrout moving into an estuarine area varied depending on latitude (April-October in TB and CH; May-November in IR and CK; and June-October in AP). These time periods coincide with the known recruitment windows for YOY spotted seatrout (Moody, 1950; Nelson and Leffler, 2001; FWC-FMRI, unpublished data).

Overall, annual relative abundance estimates from all estuarine systems appear relatively stable over the past 4 – 5 years (Figure SP02-02). Relative abundance estimates from Tampa Bay fluctuated widely prior to 1996, becoming less variable following a strong recruitment class in that year. A slight downward trend in Tampa Bay relative abundance estimates since 1996 is evident. Charlotte Harbor YOY spotted seatrout relative abundance indices declined from 1991 to 1993, then increased to levels similar to 1991 to those levels in 1997. A subsequent decline to levels akin to those of the early 1990s was seen by 1999, and the last four years of the dataset suggest a slight increase in relative abundance. Results from the Northern Indian River Lagoon showed clear indication of one very strong recruitment year in 1995 followed by a gradual decline in recruitment through 2000 (Figure SP02-02). The past three years show evidence of an increase in relative abundance, with 2002 values of 0.90 fish/set being the highest since 1999. Apalachicola Bay YOY spotted seatrout relative abundance estimates declined slightly from 1998 – 2000, with little difference between 2001 and 2002 data. Indices of YOY relative abundance from Cedar Key exhibited greatest stability of all the estuarine systems considered: a minor peak in 1998 was followed by a linear increase from 1999 – 2002, similar to Charlotte Harbor.

Monthly stratified-random sampling with 183-m haul (0-2.5 m water depths) and purse seines (1-3.3 m water depth) was included in the Fisheries-Independent Monitoring program beginning in 1996 and 1997, respectively. Sampling with the 183-m haul seine was established in all estuarine sampling areas, while purse-seine sampling began only in Tampa Bay, Charlotte Harbor and Apalachicola Bay (Table SP02-01; purse seine data not included for Apalachicola Bay as sampling only ran from 2000 - 2001). The haul seine was deployed along shallow-water shoreline areas, while the purse net fished the slightly deeper, offshore seagrass beds and sand flats. Data collected from both 183-m seine nets (January-December) were used to assess the relative abundance of the larger sized spotted seatrout (>100 mm SL) from the following estuarine areas: Tampa Bay, Charlotte Harbor, Northern Indian River Lagoon, Cedar Key, and Apalachicola Bay (Figure SP01-02). Collections from the Southern Indian River Lagoon were not analyzed for adult relative abundance due to very low numbers of spotted seatrout and the lack of 21.3-m seine sampling for YOY comparisons. Annual relative abundance estimates of larger spotted seatrout were generally more stable than the juvenile indices in all estuarine areas, except in Cedar Key where a strong peak was observed in 1998. Fewer large spotted seatrout were caught per set than YOY individuals, with the exception of Cedar Key (1997 – 2001). Preliminary analysis suggests few clear correlations exist between large and YOY spotted seatrout relative abundances in Florida. The indices correlate well in Tampa Bay when the same years are compared. In contrast, data from Apalachicola Bay show a strong negative correlation when YOY indices are compared to adult data from the previous year; a strong positive correlation is evident when YOY are associated with adult abundances in the following year. Catch per unit effort (CPUE) by 183-m purse seines was greater than 183-m haul seines in Tampa Bay for all years, but the same was not true for Charlotte Harbor (Table SP02-01).

Length-frequency data collected by 183-m haul and purse seines show that these gears provide valuable information on adult and sub-adult spotted seatrout (Figure SP02-03). While within each bay system (Tampa Bay and Charlotte Harbor) there were no statistical differences in the length composition between the two gear types (Kolmogorov-Smirnov 2-sample tests, $P > 0.05$) with each collecting the majority of fish of approximately 175 – 245 mm SL, the 183-m haul seines sampled a greater proportion of fish below and above this size range than the 183-m purse net (Figure SP02-03). Charlotte Harbor 183-m haul seine data differed from those of Tampa Bay in that a greater proportion of fish sampled were within the recreational slot size than below the minimum legal size. Data from the 183-m haul seine collections in all the remaining estuarine systems (N.Indian River lagoon, S. Indian River lagoon, Apalachicola Bay) were similar to those from Tampa Bay in terms of consisting of a greater proportion of prefishery individuals. Trends evident over the past 3 – 4 years in Apalachicola Bay, Tampa Bay and S. Indian River Lagoon suggest that there is a higher percentage of smaller fish collected than in the previous 3 – 4 year cycle (Table SP02-01). Mean length of fish taken by 183-m purse seine was also at a minimum in 2002 in Tampa Bay, although the same was not true in Charlotte Harbor.

Knowledge and understanding of the number and size of adult spotted seatrout populations in Florida waters have been increasing since the inception of monthly stratified-random sampling in 1996 using the larger 183-m seines. Stronger management regulations in the past few years have limited both recreational and commercial harvesting of spotted seatrout. These new regulations may have directly influenced the adult populations by limiting exploitation in Florida waters; however, various environmental and biological factors may also have influenced the growth and mortality of adult spotted seatrout.

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Table SP02-01. Number of spotted seatrout collected per haul (CPUE) using 183-m seines in six estuarine systems. The number in parentheses is the mean standard length (SL, mm).

	1996		1997		1998		1999		2000		2001		2002	
Gears	**Haul**	**Purse**	**Haul**	**Purse**	**Haul**	**Purse**	**Haul**	**Purse**	**Haul**	**Purse**	**Haul**	**Purse**	**Haul**	**Purse**
Bays	**CPUE (SL)**		**CPUE (SL)**		**CPUE (SL)**		**CPUE (SL)**		**CPUE (SL)**		**CPUE (SL)**		**CPUE (SL)**	
Apalachicola Bay	N/A	N/A	N/A	N/A	0.56 (253)	N/A	1.35 (254)	N/A	0.88 (245)	N/A	0.54 (233)	N/A	0.64 (217)	N/A
Cedar Key	N/A	N/A	1.08 (239)	N/A	4.13 (235)	N/A	2.06 (202)	N/A	1.03 (261)	N/A	0.99 (222)	N/A	0.65 (206)	N/A
Tampa Bay	0.81 (254)	N/A	0.46 (226)	1.04 (247)	0.54 (227)	0.95 (249)	1.04 (279)	1.07 (247)	0.31 (241)	1.27 (254)	0.68 (228)	1.00 (261)	0.47 (200)	1.10 (226)
Charlotte Harbor	0.45 (205)	N/A	0.43 (280)	N/A	0.19 (230)	0.42 (270)	0.46 (304)	0.38 (251)	0.30 (248)	0.39 (238)	0.28 (258)	0.38 (227)	1.06 (260)	0.42 (255)
South Indian River	N/A	N/A	0.10 (314)	N/A	0.11 (299)	N/A	0.16 (308)	N/A	0.07 (382)	N/A	0.09 (261)	N/A	0.06 (200)	N/A
North Indian River	N/A	N/A	0.33 (246)	N/A	0.47 (243)	N/A	0.54 (211)	N/A	0.50 (206)	N/A	0.40 (203)	N/A	0.75 (221)	N/A

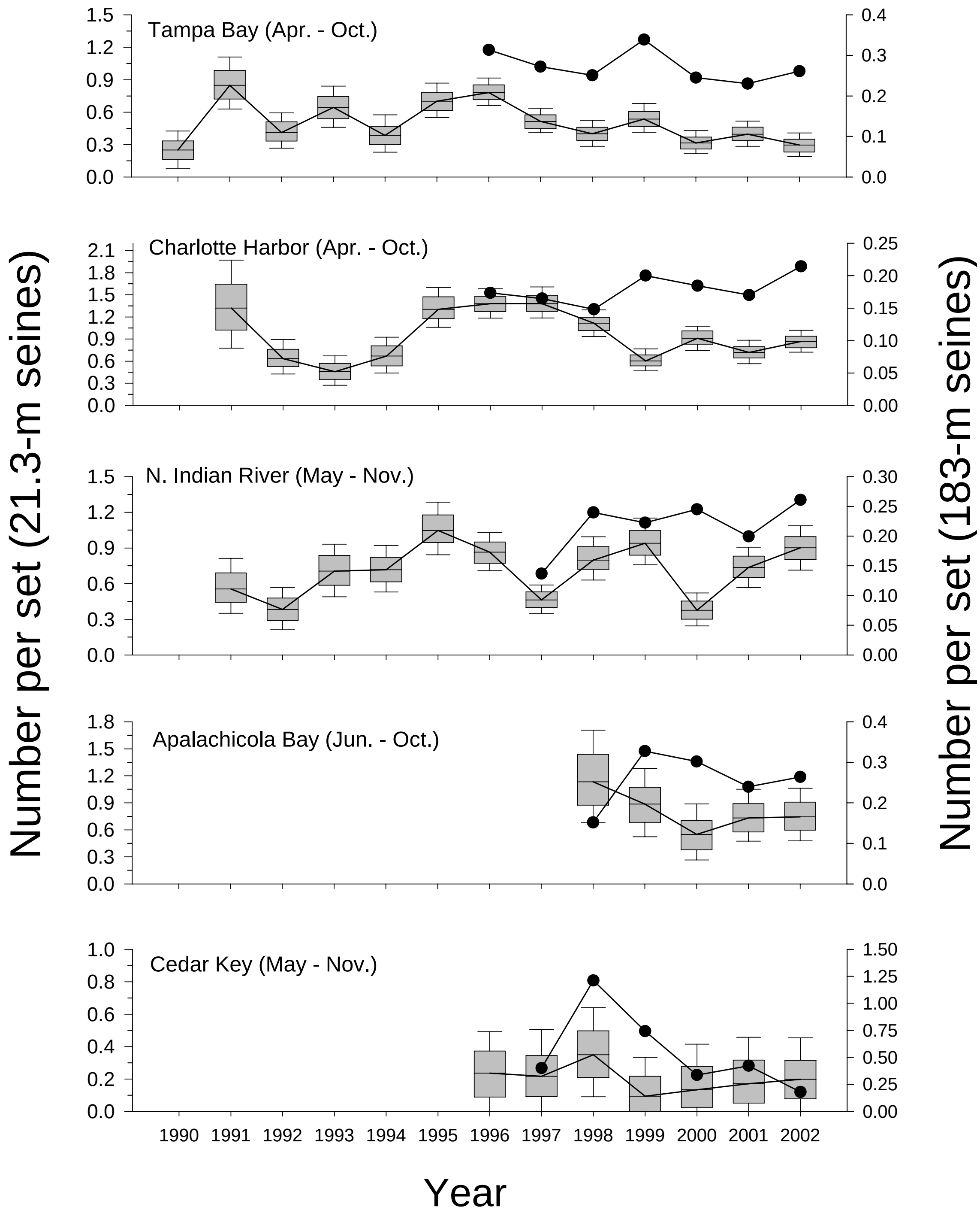
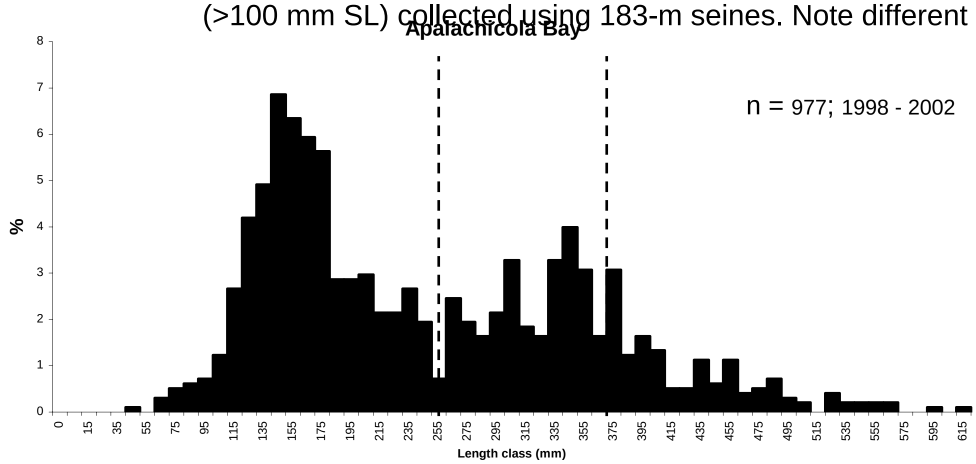
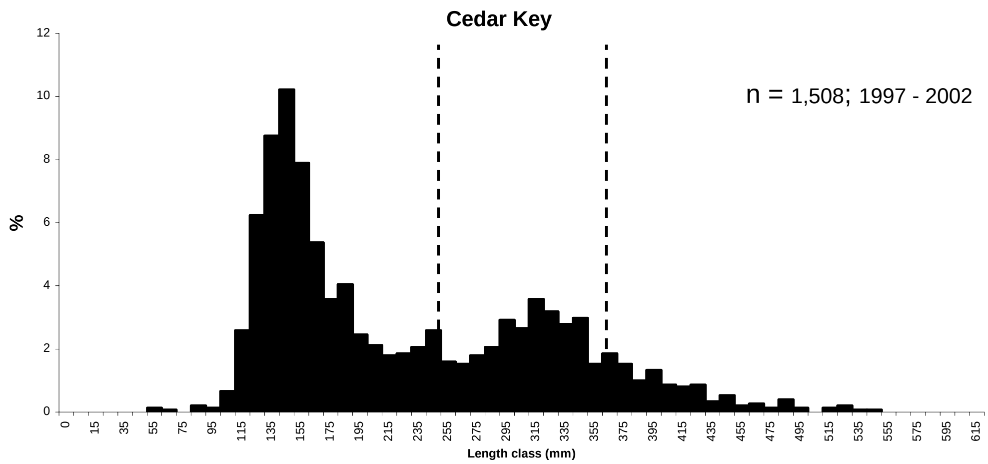


Figure SP02-02. Relative abundance of spotted seatrout ($\leq$100 mm SL) collected during 1990-2002 using 21.3-m seines. The box represents the 25th and 75th percentiles, the vertical line extends from the 10th–90th percentiles, and the horizontal line indicates the median estimate. The line and scatter plot (●) represents median relative abundance of adult spotted seatrout (>100 mm SL) collected using 183-m seines. Note different scales.





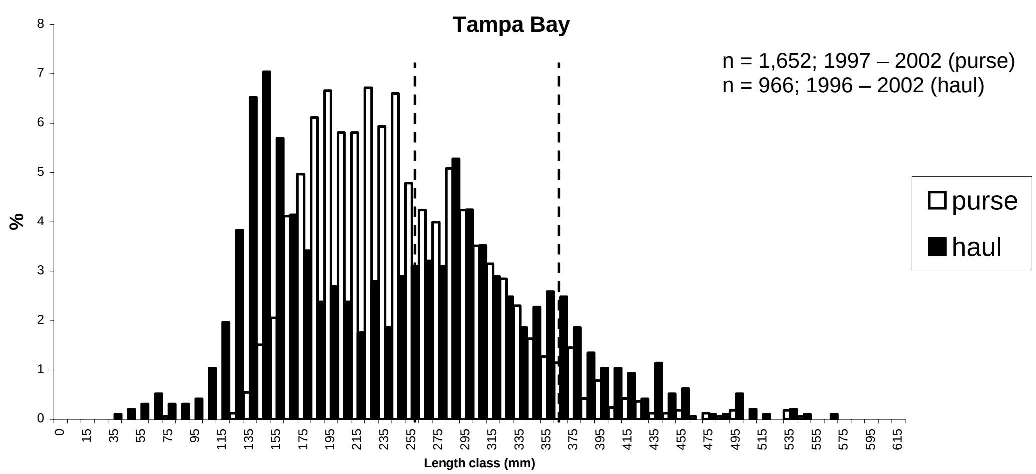
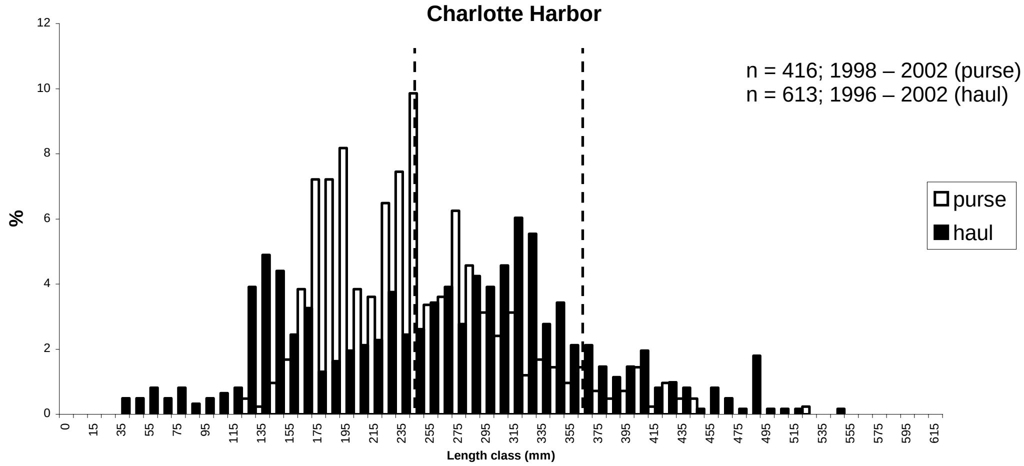
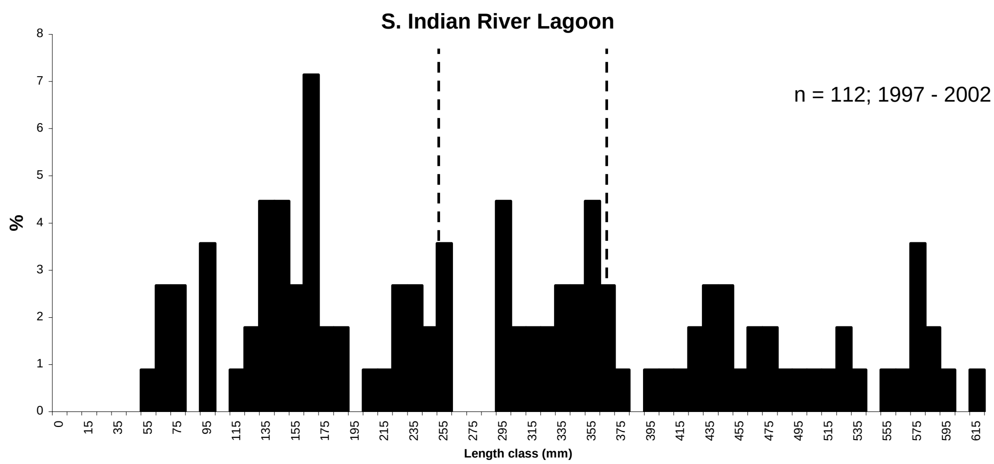


Figure SP02-03. Length frequency diagrams of spotted sea trout collected using 183-m haul (■) or purse (□) seines. Dashed lines (- - -) indicate approximate recreational fishing slot limits. All lengths are standard length (SL).





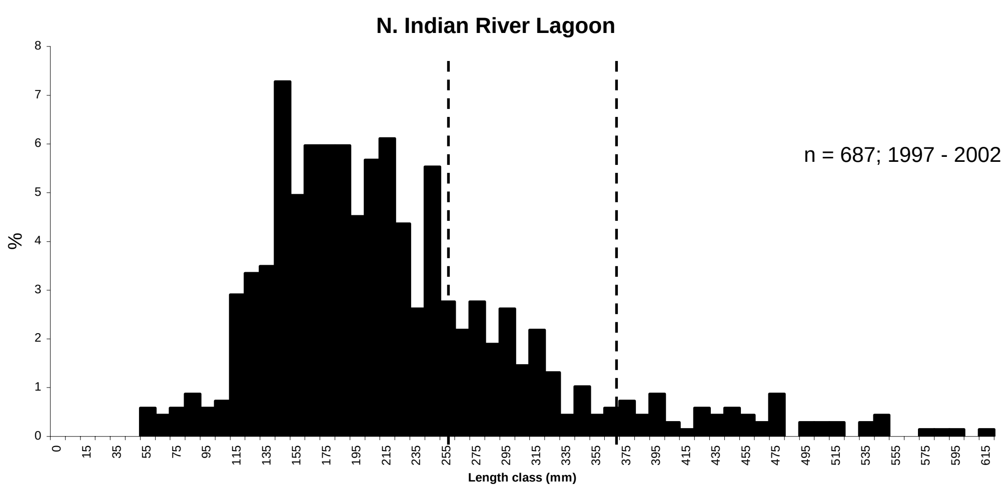


Figure SP02-03 (cont.). Length frequency diagrams of spotted seatrout collected using 183-m haul (■) or purse (☐) seines. Dashed lines (- - -) indicate approximate recreational fishing slot limits. All lengths are standard length (SL).

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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 in Florida commonly harvest sheepshead, with the majority taken by the recreational fishery from 1986 – 1999 (Murphy and MacDonald 2000). Recreational fisherman captured 89% and 96% of the total number of individuals landed on the Atlantic and Gulf Coasts, respectively, in 1999 (Murphy and MacDonald 2000). Sheepshead in Florida waters are currently regulated by size (12" fork length, 268 mm standard length) and bag (15 fish/day) limits. Although the most recent stock assessment indicates that growth overfishing is unlikely, the potential for recruitment overfishing remains for Atlantic Coast sheepshead (Murphy et al. 1997). Annual estimates of relative abundance for sheepshead during various life stages (young-of-the-year, pre-fishery, and fully recruited) are valuable tools for fine-tuning virtual population models developed for stock assessments and can be used to investigate associations between young-of-the-year and adult abundances.

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 July. Young-of-the-year sheepshead grow to approximately 40 mm standard length (SL) by June and 130 mm SL by April of the following year (age 1). 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; MacDonald unpublished data). Based upon data from Louisiana, sheepshead reach sexual maturity at two years of age (Render and Wilson 1992), shortly before they recruit into the fishery in Florida waters.

Catch data from the Fisheries-Independent Monitoring (FIM) program's stratified-random sampling surveys were examined to assess sheepshead relative abundances during four life history stages (early YOY, late YOY, pre-fishery, and fully recruited); gear types and months examined varied for each life history stage (Table SP02-02). In each estuary, sheepshead ≤ 40 mm SL represented early YOY (Figure SP02-04), while sheepshead between 50 and 95 mm SL represented late YOY (Figure SP02-05). Analyses were conducted separately for sheepshead that had not yet entered the fishery (131 to 267 mm SL) and for those that were fully recruited to the fishery (≥268 mm SL; Figure SP02-

04). Relatively few YOY sheepshead were collected in either Cedar Key or Apalachicola Bay (Figures SP02-04 and -05), so annual estimates of relative abundance were not prepared for either early or late YOY sheepshead in these estuaries. Similarly, annual estimates for early YOY sheepshead were not available for the Southern Indian River Lagoon where 21.3-m seine samples were not collected.

Annual estimates of relative abundance for early YOY sheepshead have been fairly constant on the Atlantic Coast between 1997 and 2002, while exhibiting cyclical patterns on the Gulf Coast (Figure SP02-05). In Tampa Bay, two years of low to moderate abundance estimates have typically been followed by a year of higher relative abundance (1991, 1994, 1997 and 2000). Data for Charlotte Harbor followed the same trend as Tampa Bay until 1997, when years of alternating high and low abundance commenced, continuing through 2002. Annual estimates of relative abundance for the Northern Indian River Lagoon have fluctuated around 0.08 fish/set with a peak of 0.11 fish/set in 2000.

Late YOY sheepshead estimates of relative abundance were fairly stable on the Gulf Coast through 2000, and on the Atlantic Coast through 1999 (Figure SP02-05). Clear peaks in abundance were evident in the Northern and Southern Indian River Lagoon in 2000, followed by decreases to levels at or slightly greater than pre-2000. Annual abundance estimates for late YOY in Tampa Bay were lowest in 1996 (0.02 fish/set) and highest in 2002 (0.18 fish/set) with a median abundance estimate of 0.09 fish/set across all years. Charlotte Harbor abundance estimates were also highest in 2002 (0.14 fish/set), while they were lowest in 2001 (0.00 fish/set).

Pre-fishery and fully recruited size-classes of sheepshead along the Gulf and Atlantic Coasts of Florida had estuarine-specific trends in abundance estimates. Evidence of a slight decline in numbers of fully recruited individuals exists for Cedar Key and Tampa Bay (Figure SP02-06). Charlotte Harbor and Apalachicola have had increasing trends in abundance estimates of both pre-fishery and fully recruited sheepshead since sampling began (1996 and 1998, respectively). The Southern Indian River Lagoon had a decreasing trend in annual abundance estimates for pre-fishery sheepshead from 1998 – 2001, with an increase occurring in 2002 (although data for the remaining three months of the 2002-2003 biological year are not yet available). The Northern Indian River Lagoon has had relatively stable abundance estimates for fully recruited sheepshead. Pre-fishery individuals showed little variation in abundance from 1997-1999, then increased to substantially greater numbers in 2000 and have remained stable at this higher level through 2002.

Comparisons between estuaries for pre-fishery sheepshead show that abundance estimates were highest in the Northern and Southern Indian River Lagoon (0.14 to 0.79 fish/set); intermediate in Charlotte Harbor, Tampa Bay, and Apalachicola (0.18 to 0.44 fish/set); and lowest in Cedar Key (0.04 to 0.14 fish/set). Estimates of relative abundance for fully recruited sheepshead, however, were higher in Cedar Key (0.53–0.79 fish/set) than in most of the other estuaries sampled, with the exception of the Southern Indian River Lagoon. The latter region showed less stability, with values from 1998-2000 higher than the maximum for Cedar Key, while levels in 2001-2002 were below that of the Cedar Key minimum.

The Pearson correlation coefficient between early and late YOY annual abundance estimates was positive and relatively high for the Northern Indian River Lagoon (0.86; $P<0.05$). No other estuary showed high correlation between the two groups of YOY analyzed. With the inclusion of environmental parameters in regression models and the accumulation of additional years of abundance estimates, the correlation between early and late YOY should become more apparent. Correlating relative abundance estimates among other size-classes will be more difficult, probably requiring the inclusion of age data, since the pre-fishery and fully recruited size classes represent wide ranges of overlapping ages (Beckman et al. 1991; Dutka-Gianelli and Murie 2001; MacDonald unpublished data).

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Table SP02-02. Size ranges, gear types, and months examined when calculating annual relative abundance estimates for each life history stage of sheepshead.

Life History Stage	Size Range (mm SL)	Gear types	Months
Early YOY	0-40	21.3-m bay and river seines	April-July
Late YOY	50-95	183-m haul seine	August-December
Pre-fishery	131-267	183-m haul seine	April-March
Full Recruited	≥268	183-m haul seine	April-March

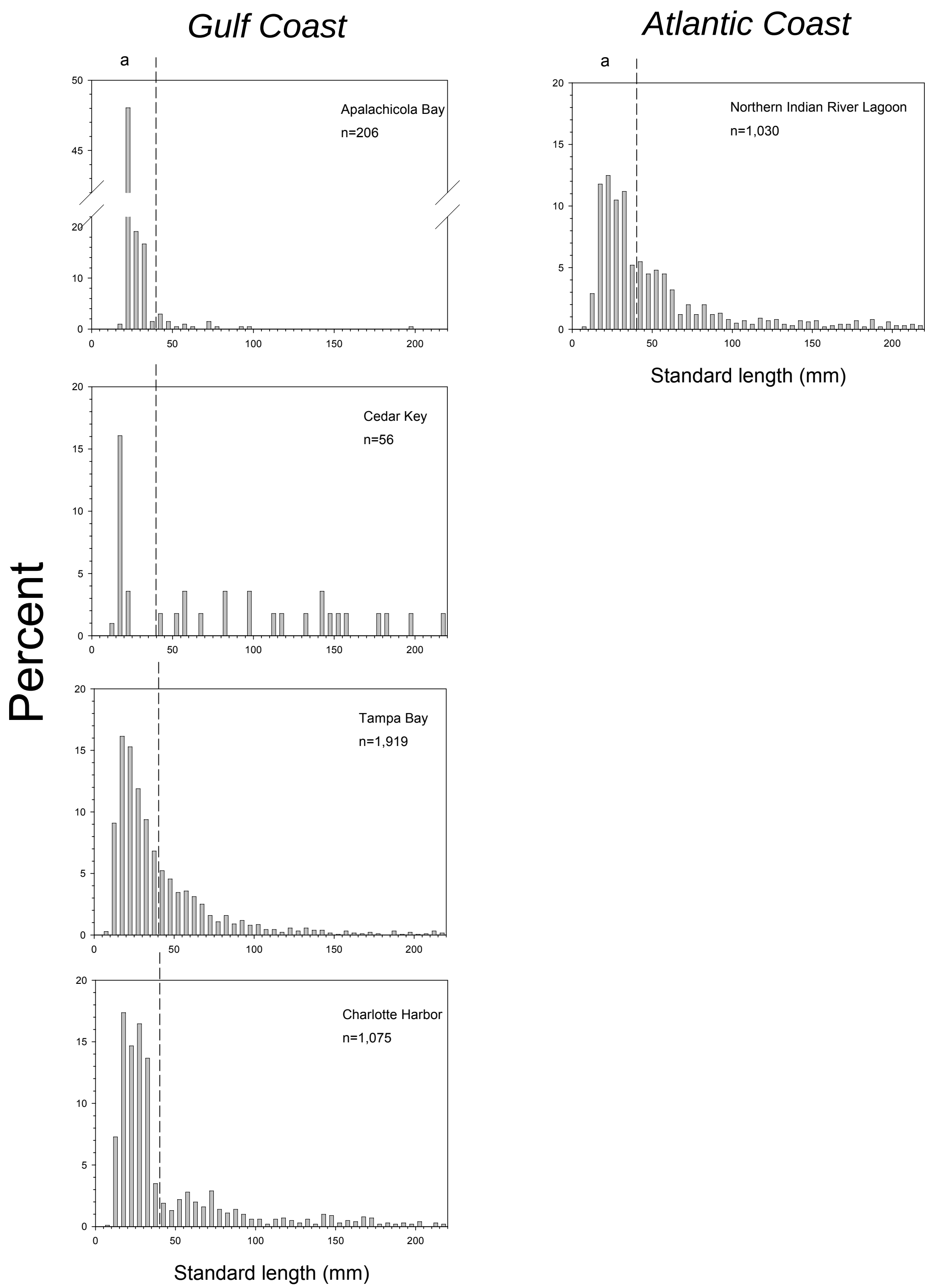

Figure SP02-04. Length frequency distribution of sheepshead collected during 21.3-m seine stratified-random sampling in each of the estuaries surveyed by the Fisheries-Independent Monitoring program. Charlotte Harbor and Tampa Bay were surveyed from 1989 to 2002; the Northern Indian River was surveyed from 1990 to 2002; Cedar Key was surveyed from 1996 to 2002; and Apalachicola was surveyed between 1998 and 2002. The southern Indian River was not surveyed with 21.3-m seines. The vertical dotted line and letter (a) denotes the early young-of-year size class. n=number of fish.

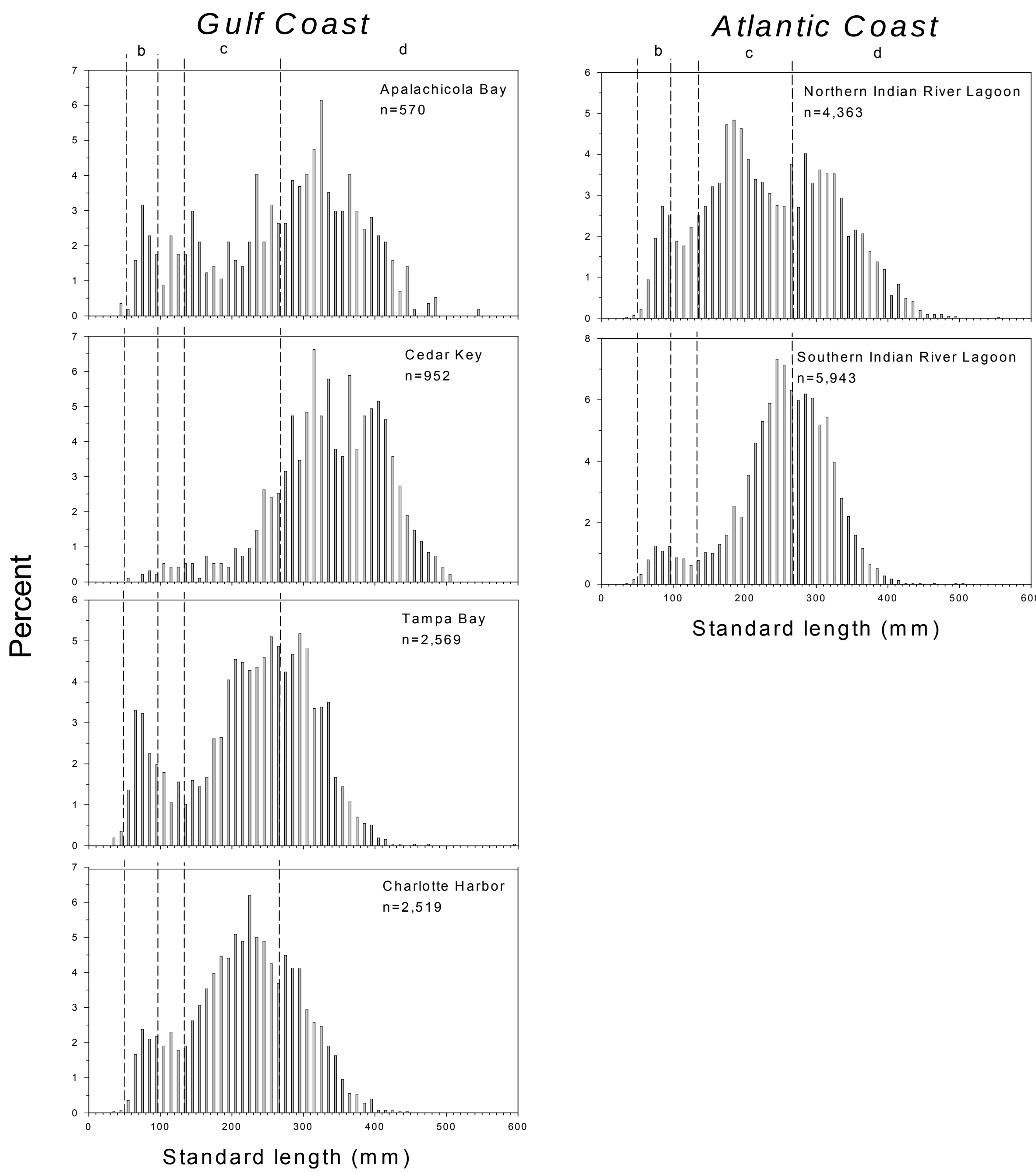

Figure SP02-05. Length frequency distribution of sheepshead collected during 183-m haul seine stratified-random sampling surveys in each of the estuaries surveyed by the Fisheries-Independent Monitoring program. Charlotte Harbor and Tampa Bay were surveyed from 1996 to 2002; Southern and Northern Indian River Lagoon, and Cedar Key were surveyed from 1997 to 2002; and Apalachicola Bay was surveyed from 1998 to 2002. The dotted vertical lines and letters designate three of the size classes analyzed: b) late young-of-year, c) pre-fishery, and d) fully recruited. n = number of fish.

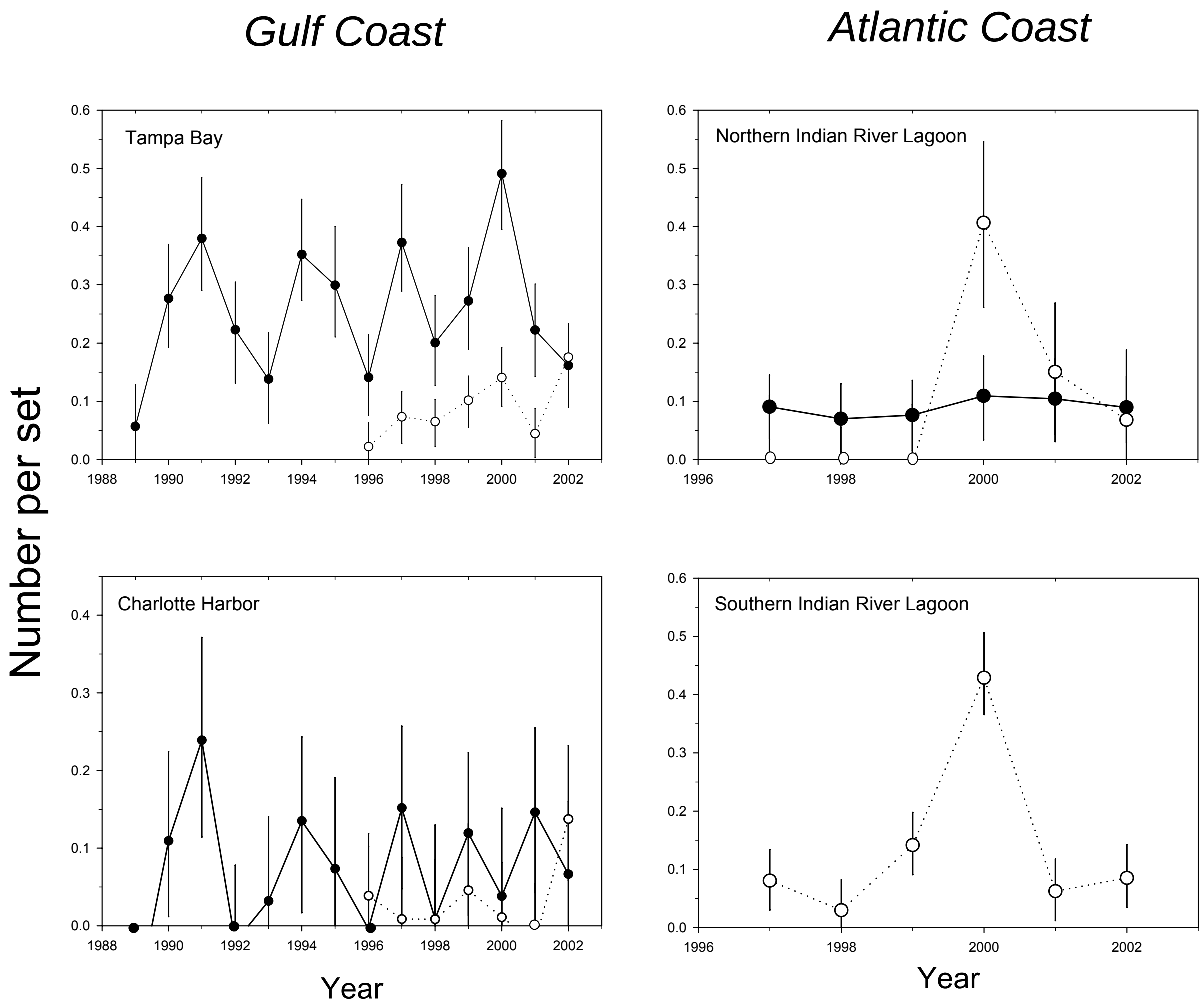

Figure SP02-06. Annual relative abundance estimates for young-of-the-year sheepshead collected during stratified-random sampling surveys in estuaries along the Gulf and Atlantic Coasts of Florida. Early YOY sheepshead (≤40 mm SL, collected in 21.3-m seines between April and July) are represented by filled circles and solid lines. The dotted lines and open circles represent late YOY sheepshead (50 to 95 mm SL) collected in 183-m haul seines between August and December. Symbols (opened and filled circles) represent median values and vertical lines represent interquartile ranges.

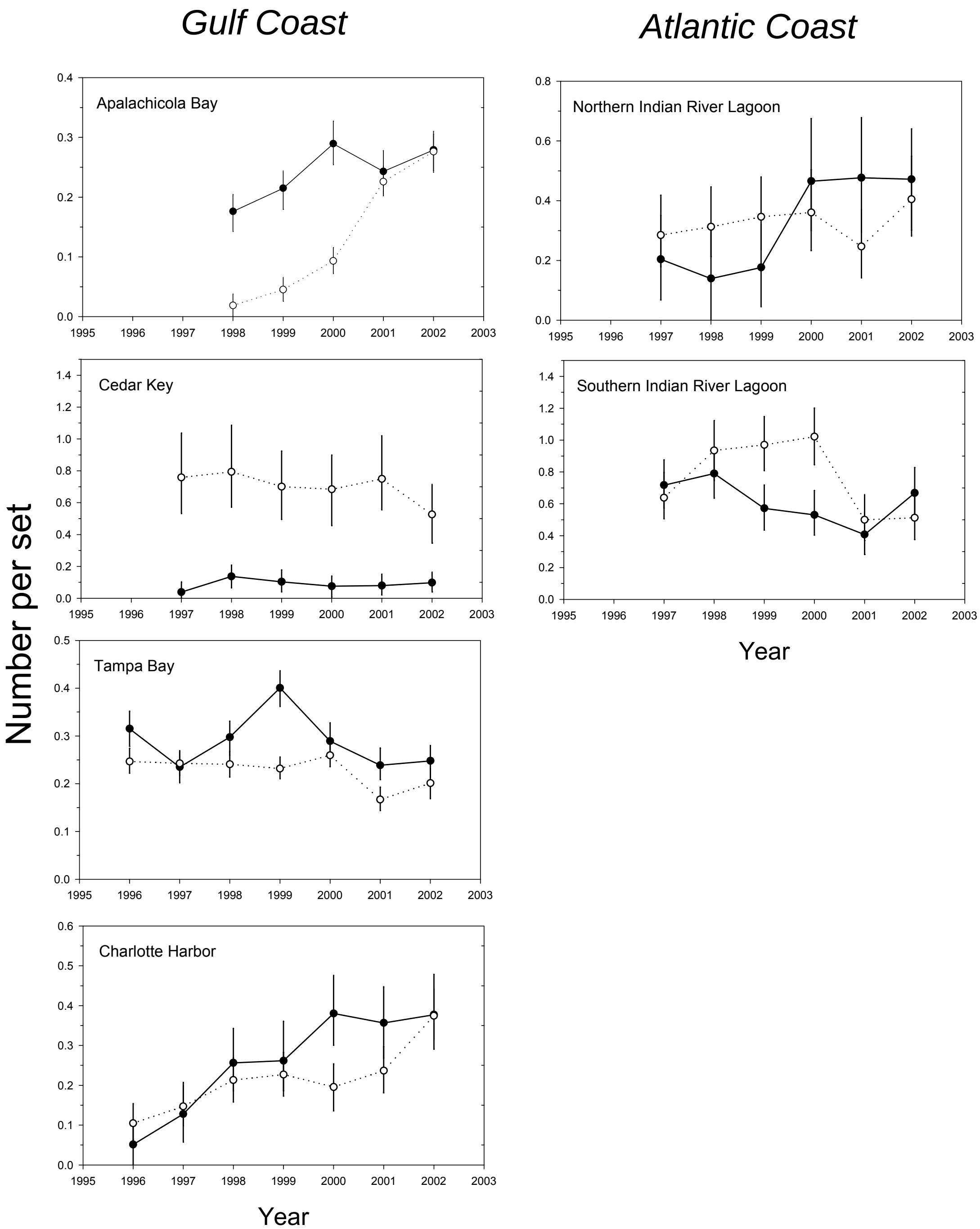

Figure SP02-07. Annual relative abundance estimates for pre-fishery (131 to 267 mm SL) and fully recruited (≥268 mm SL) sheepshead collected during stratified-random sampling surveys in estuaries along the Gulf and Atlantic Coasts of Florida. Pre-fishery sheepshead are represented by filled circles and solid lines, while the dotted lines and open circles represent sheepshead that have recruited into the fishery. Year represents a biological year (April–March); abundance estimates for 2002, therefore, are based on a partial year since January–March 2003 data were not available for analysis. Symbols (opened and filled circles) represent median values and vertical lines represent interquartile ranges.

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Striped Mullet, *Mugil cephalus*

Striped mullet, *Mugil cephalus*, is one of Florida's most abundant and widespread estuarine-dependent fish species (Odum 1970; Leard et al. 1995). Recreational anglers capture striped mullet for bait and food. Striped mullet supported a valuable commercial fishery from the early 1960s to the late 1980s, with approximately 90% of all U.S. production occurring in the Gulf of Mexico and over 80% of all commercially caught striped mullet landed in Florida waters (Rivas 1980; Leard et al. 1995). However, from 1991 to 1994 commercial striped mullet landings severely declined in Florida from 79% to 46% of the total Gulf production (Leard et al. 1995). With 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 in Florida, striped mullet commercial landings were reduced by 80% (Mahmoudi 1997). Currently, only 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. Recruitment of young-of-the-year (YOY) striped mullet to the estuary usually begins in January and continues through April, with peaks of abundance in February and March; however, FIM length-frequency data have indicated that recruitment can occur in Florida's estuaries as early as the end of December. Typically, YOY striped mullet recruit into Florida's estuaries at 20 to 35 mm standard length (Kilby 1949; Futch 1966).

Recruitment indices for YOY striped mullet were developed in select Florida estuaries to assess long-term trends in the YOY abundance in order to predict future stock fluctuations in the adult population. Using 21.3-m bay seines, YOY striped mullet were collected at fixed-stations from 1989 to 1995 (Tampa Bay, Charlotte Harbor and the Northern Indian River Lagoon only), and at stratified-random sampling (SRS) sites from 1989 through 2002. Data from January to April of each year were used to examine the recruitment of YOY (>35 mm SL) striped mullet in Tampa Bay (1989 - 2002), Charlotte Harbor (1991 - 2002), Northern Indian River Lagoon (1991 - 2002), Cedar Key (1997 -

2002), and Apalachicola Bay (1998 - 2002).

Fluctuations in YOY striped mullet abundance were detected in fixed-station sampling from Tampa Bay between 1989 and 1993, with abundance estimates peaking in 1994 and 1995 (Figure SP02-08). Collection of mullet through SRS showed that abundance estimates were stable from 1989 through 2002, with peaks in 1995, 1998 and 2001. Relative abundance of YOY striped mullet in Charlotte Harbor fixed-station sampling fluctuated slightly from 1991 through 1994, but increased sharply in 1995. Stratified-random sampling results indicated that relative abundance estimates for YOY striped mullet were stable in Charlotte Harbor, showing a similar pattern compared to that found in Tampa Bay with recruitment peaks observed during 1998 and 2001. Fixed-station sampling in the Northern Indian River Lagoon from 1991 through 1995 indicated an upward trend in abundance estimates of YOY striped mullet; however, SRS YOY abundance estimates have been cyclic in the Indian River Lagoon. Initiation of SRS began in 1997 in Cedar Key and relative abundance estimates of YOY striped mullet showed a stable trend through 2002. Apalachicola SRS began in 1998 and YOY abundance estimates have been stable with the exception of 2000. In all five areas, abundance estimates for YOY striped mullet have shown a similar pattern with recruitment peaks during 1998 and 2001 and a decline in abundance estimates during 2002.

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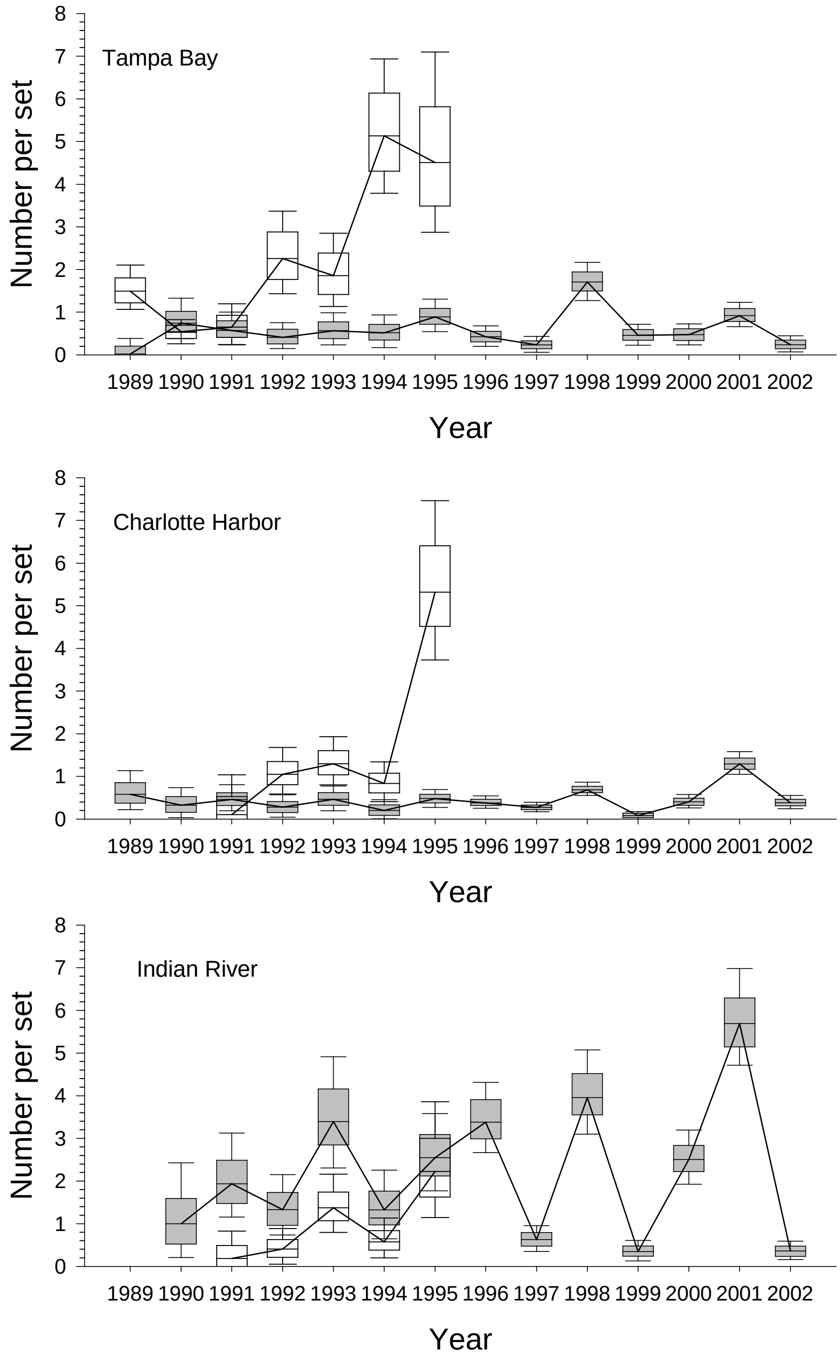
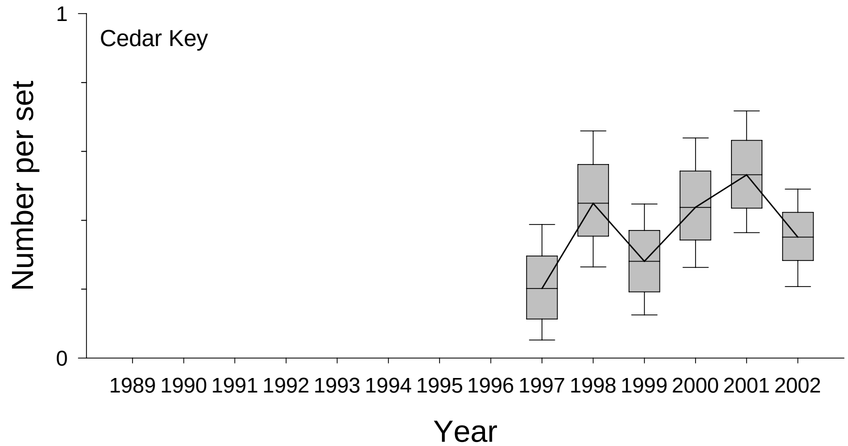


Figure SP02-08. Indices of relative abundance for young-of-the-year striped mullet (>35 mm SL) collected using the 21.3-m bay seine during fixed-station sampling (January - April, 1989 – 1995) and stratified-random sampling (January - April, 1989 – 2002) surveys in Tampa Bay, Charlotte Harbor, and Indian River Lagoon. Fixed-station sampling is indicated with open boxes and SRS is indicated with filled boxes. The box represents the 25th to 75th percentiles, the vertical line represents the 10th to 90th percentiles, and the horizontal line represents the median estimate.



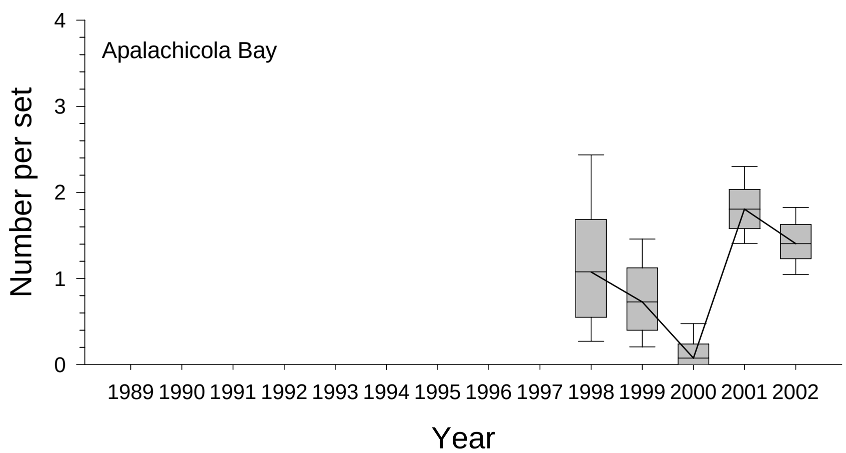


Figure SP02-08. (Continued). Indices of relative abundance for young-of-the-year striped mullet (>35 mm SL) collected using the 21.3-m bay seine during stratified-random sampling surveys in Cedar Key (January – April, 1997 - 2002) and Apalachicola Bay (January – April, 1998 - 2002). The box represents the 25th to 75th percentiles, the vertical line represents the 10th to 90th percentiles, and the horizontal line represents the median estimate. Note the different abundance scales for each system.

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Pinfish, *Lagodon rhomboides*

The pinfish, *Lagodon rhomboides*, is an ecologically and recreationally important sparid found in marine and estuarine waters from Cape Cod, Massachusetts to Texas (Bigelow and Schroeder 1953; Caldwell 1957). It is one of the most abundant species captured in estuaries of the northeastern Gulf of Mexico (Hoese and Jones 1963; Hansen 1970; Ogren and Brusher 1977). Studies have shown that predation by pinfish plays a role in the organization of seagrass macrobenthic 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*), snook (*Centropomus undecimalis*), and gag grouper (*Mycteroperca microlepis*).

To understand the mechanisms influencing young-of-the-year (YOY) recruitment, annual indices of abundance were generated to determine if similar trends in YOY densities were evident in Tampa Bay, Charlotte Harbor, northern Indian River Lagoon, Cedar Key, and Apalachicola Bay. Only 21.3-m seine data from January-June stratified-random sampling was used because this period covered peak YOY recruitment into the estuaries (Nelson 1998). Only individuals measuring less than 80 mm SL were used in the analysis. This length represents the average maximum size that individuals of YOY cohorts attain through June (Nelson 1998). Due to historical changes in sampling design, certain zones in each estuary, which were sampled consistently, were included to generate annual indices of abundance (Tampa Bay and Cedar Key = all zones; Charlotte Harbor = A, B, and C; Indian River Lagoon = C, D, and E; Apalachicola Bay = A and B).

Trends of relative abundance varied among estuaries. In Tampa Bay, indices of relative abundance (median fish/haul) showed that YOY pinfish abundance fluctuated between 15.4 fish/haul and 3.4 fish/haul (Figure SP02-09). Abundance peaked in 1992 and 2001 with 15.4 fish/haul and 10.2 fish/haul, respectively. In Charlotte Harbor, relative abundance was much higher and fluctuated between 206.4 fish/haul and 26.4 fish/haul with peaks in 1994 (206.4 fish/haul), 1995 (190.7 fish/haul), and 1998 (117.8 fish/haul). In the northern Indian River Lagoon, relative abundance of YOY pinfish remained at a consistently low level of less than 2 fish/haul with the highest abundance in 1992 (1.6 fish/haul). In Cedar Key, pinfish abundance peaked at 3.8 fish/haul in 2000 and fluctuated between 2.1 fish/haul and 0.2 fish/haul in other years. In Apalachicola Bay, YOY pinfish abundance peaked in 2001 at 9.0 fish/haul and dropped to 5.6 fish/haul in 2002.

Inter-bay comparisons revealed that the relative abundance of YOY pinfish was generally highest in Charlotte Harbor, followed by Tampa Bay, Cedar Key, Apalachicola Bay, and the northern Indian River Lagoon. Relative abundances of YOY pinfish in the northern Indian River Lagoon and Cedar Key showed slight increases in 2002 while abundances decreased in other estuaries. A four-year cycle of pinfish abundance was observed in Tampa Bay and Charlotte Harbor (Figure SP02-09): 1990-1993, 1993-1996, 1996-1999, 1999-2002. The magnitude and timing of the peak abundances varied among cycles. Pinfish catch rates from FMRI offshore baitfish cruises exhibited the same cycles as the Gulf of Mexico cycles (Tsou pers. obs.). Additional years of sampling and further studies are required to verify the periodicity and to identify the mechanisms behind these observations.

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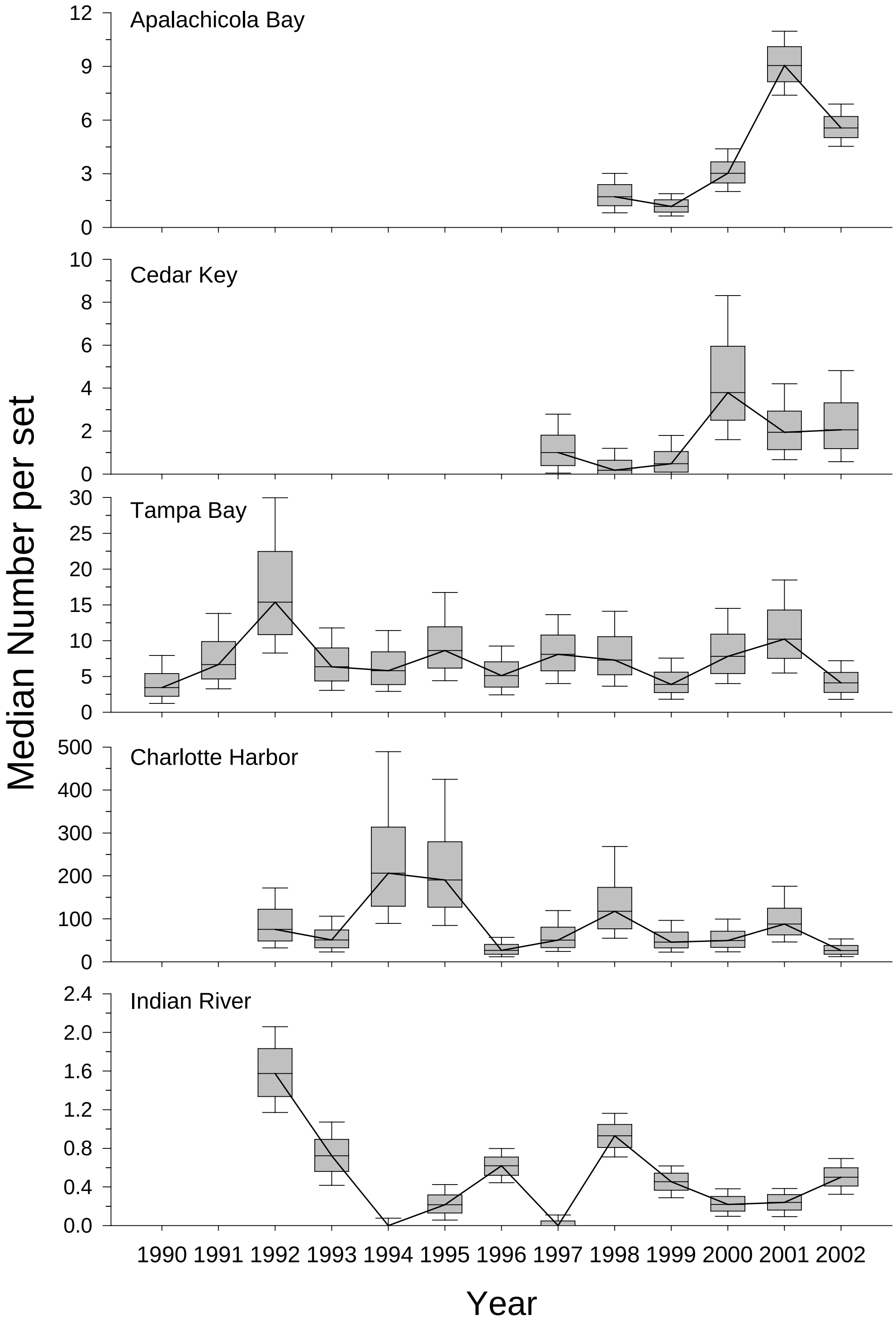

Figure SP02-09. Relative abundance of pinfish (<80 mm SL) collected in Jan.-Jun. in Apalachicola, Cedar Key, Tampa Bay, Charlotte Harbor, and Indian River lagoon, 1990 – 2001. The box represents the 25th – 75th percentiles, the vertical line extends from the 10th – 90th percentiles, and the horizontal line indicates the median estimate.

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Blue Crab, *Callinectes sapidus*

Along the Atlantic and Gulf coasts of the United States, valuable commercial and recreational fisheries exist for blue crabs (*Callinectes sapidus*). Florida's Gulf Coast commercial landings over the period 1990 through 2001 averaged 8.4 million pounds worth an estimated 5.3 million dollars (NMFS, landings statistics). Gulf landings peaked in the late 1990's at almost 13 million pounds, but have declined in recent years. Although fishing effort has been limited in recent years by the number of restricted species permits issued, there are no quotas for blue crab landings. The entanglement net limitation in 1995 raised concern that blue crab populations may experience increased fishing pressure, from former net fishers seeking income from other fisheries resources, namely blue crabs.

Blue crabs are an integral part of the estuarine ecosytem. Blue crabs are both scavengers and predators, feeding on juvenile fishes, molluscs, and crustaceans. They may also play a valuable role in controlling populations of other estuarine species. For example, in areas with depleted blue crab populations, molluscs that graze on *Spartina alterniflora* have multiplied enough to contribute to salt marsh die-offs (Sillman and Bertness 2002). At the same time, many important gamefish species such as black drum (Simmons and Breuer 1962), red drum (Gunter 1945; Scharf and Schlicht 2000), snook (Blewett, FIM unpublished data), and cobia (Meyer and Franks 1996) have been shown to feed on blue crabs. In addition to predation and harvest by man, populations of blue crabs are affected by a myriad of other factors such as fresh water inflows (Wilber 1994), pesticides, disease, and habitat alteration. It is for these reasons that baseline data are necessary to monitor changes in the blue crab population.

Juvenile blue crabs (≤65-mm carapace width (CW)) are frequently captured in offshore, beach, and river set 21.3-m seine sampling in Fisheries-Independent Monitoring (FIM) program study areas. Smaller blue crabs are abundant in FIM seine samples from August through March; and stratified-random sampling data from these months were used to calculate juvenile abundance indices for Apalachicola Bay, Cedar Key, Tampa Bay, Charlotte Harbor, and the Indian River Lagoon. The recruitment window of August through March was chosen because analysis of monthly length frequency data indicate that few if any small blue crabs ($\leq$ 15 mm CW) appear in 21.3-m seine catches from April through July. Therefore; data from August to December of each year were combined with data from January to March of the following year to create biological years of data (data collected prior to 1996 includes September through December and March seasonal data only). This method produced a 2001 index that includes data from both 2001 and 2002. The juvenile index value for 2002 did not include spring 2003 data, which were not yet available.

The indices of abundance for juvenile blue crabs demonstrate no consistent trends at Cedar Key, Tampa Bay, or Charlotte Harbor (all 21.3-m seine sets combined). These indices all show peaks in abundance during 1998 and 1999, with subsequent declines almost every year since (Figure SP02-10). Apalachicola Bay's first full year of sampling started in 1998, and the index for that area has declined since then as well. Although only four years of complete data exist for Appalachicola Bay, the catch rates are the highest calculated from around the state, followed closely by Cedar Key. In the Northern Indian River Lagoon, relative abundance peaked in 1991, then declined and remained relatively stable through 1997.

Data collected from 183-m seine nets were used to assess the abundance of larger blue crabs (>70 mm CW). Data from January through December stratified-random sampling were used to calculate abundance indices for the larger crabs. The adult relative indices of abundance for all areas peaked in 1998. Compared to the juvenile abundance estimates, the adult catches were lower for Apalachicola Bay, and higher for Tampa Bay, Charlotte Harbor and the Indian River Lagoon. Overall the highest adult abundance estimates occurred in Charlotte Harbor.

Due to the time lag in the calculation of juvenile indices (August through March), the large crabs from a given year will most likely be the parents of the juveniles in that year’s index. This convention is supported by the way the two separate indices track each other relatively well.

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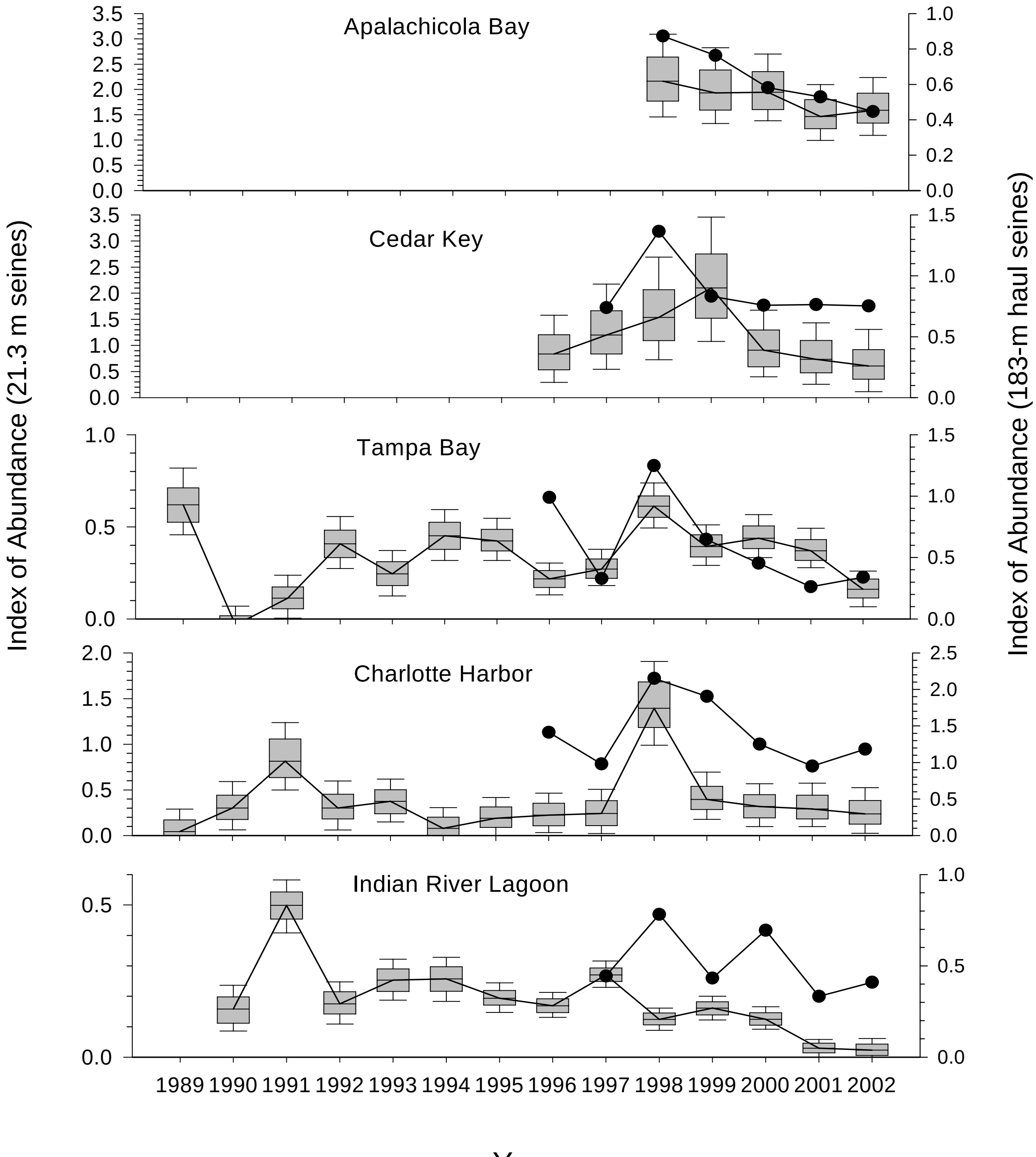

Figure SP02-10. Indices of relative abundance of juvenile blue crab (≤65 mm CW) collected in offshore, shore, and boat-set 21.3-m seines from August-March SRS, 1989 - 2002. The 2002 index does not include data from January-March of 2003. The box represents the 25th - 75th percentiles, the vertical line extends from the 10th - 90th percentiles, and the horizontal line represents the median value. The line and scatter plot (●) represents median relative abundance of larger blue crabs (>70mm CW) collected using 183-m haul seines. Please note the change of axis on all of the graphs.