Florida Fish and Wildlife Conservation Commission

Fish & Wildlife Research Institute

Fisheries-Independent Monitoring Program 2023 Annual Data Summary Report

Compiled by the Fisheries-Independent Monitoring Program Staff
Fish & Wildlife Research Institute
100 8th Avenue SE
St. Petersburg, FL 33701
Telephone: (727) 896-8626

This research is funded in part by the Department of the Interior, U.S. Fish and Wildlife Service Federal Aid for Sport Fish Restoration, the Sarasota Bay Estuary Program, and by funds from Florida Saltwater Fishing License sales.

FWRI INHOUSE REPORT IHR2024-002

Table of contents

List of Figures

List of Tables

Preface

Changes from previous reports

Starting with the 2022 version of this report, several changes were made from previous versions, including:

- Addition of Santa Rosa Sound, Choctawhatchee Bay, and Sarasota Bay to data summaries
- Order of estuaries in data summaries was changed to reflect a more logical geographical order (i.e., west to east, north to south)
- Species profiles were amended to include a more quantitative, objective interpretation of Indices of Abundance figures
- Addition of section detailing annual monitoring of Gulf of Mexico polyhaline seagrass habitats
- Included more species in our list of selected species to account for reef-associated juvenile stages

Overview

This report provides a summary of the data collected in 2023 by the Florida Fish and Wildlife Conservation Commission (FWC) Fish and Wildlife Research Institute's (FWRI) Fisheries-Independent Monitoring (FIM) program. Monitoring was conducted following a stratified-random sampling (SRS) design in Fort Walton including the Santa Rosa Sound and Choctawhatchee Bay (monthly, June to December), Apalachicola Bay (monthly, January to December), Cedar Key (monthly, January to December), Tampa Bay (monthly, January to December), Sarasota Bay (bimonthly, January to December), Charlotte Harbor (monthly, January to December), northeast Florida (monthly, January to December), and the northern and southern portions of the Indian River Lagoon (IRL; monthly, January to December). Gears used for routine monitoring in the various areas included 21.3-m seines set in bays and rivers, 6.1-m otter trawls, and 183-m haul seines (Table 1). See Chapter 2 for more details on these gears.

Table 1: Gear usage by estuary for FIM program stratified-random-sampling, 2023.

Study Area	21.3-m Seines		183-m Haul Seines	6.1-m Otter Trawls
	Bay	River		
Santa Rosa Sound	–	–	X	–
Choctawhatchee Bay	–	–	X	–
Apalachicola Bay	X	X	X	X
Cedar Key	X	X	X	X
Tampa Bay	X	X	X	X
Sarasota Bay	X	–	X	–
Charlotte Harbor	X	X	X	X
Northeast Florida	–	X	X	X
Northern Indian River Lagoon	X	X	X	–
Southern Indian River Lagoon	–	X	X	–

There were 1,474,422 animals collected in 5,967 samples from all estuaries (Figure 1). The most samples were collected with 21.3-m seines (n=3,520), followed by 183-m haul seines (n=1,482), and 6.1-m otter trawls (n=965). Total sampling effort in each estuary ranged from 28 hauls made in Santa Rosa Sound to 1,336 hauls made in Northeast Florida (Table 2). The total number of animals collected ranged from 5,700 in Santa Rosa Sound to 450,020 in Tampa Bay (Table 2).

The majority of animals were collected in 21.3-m seines (n=1,144,802; 77.6% of the total catch; Table 2).

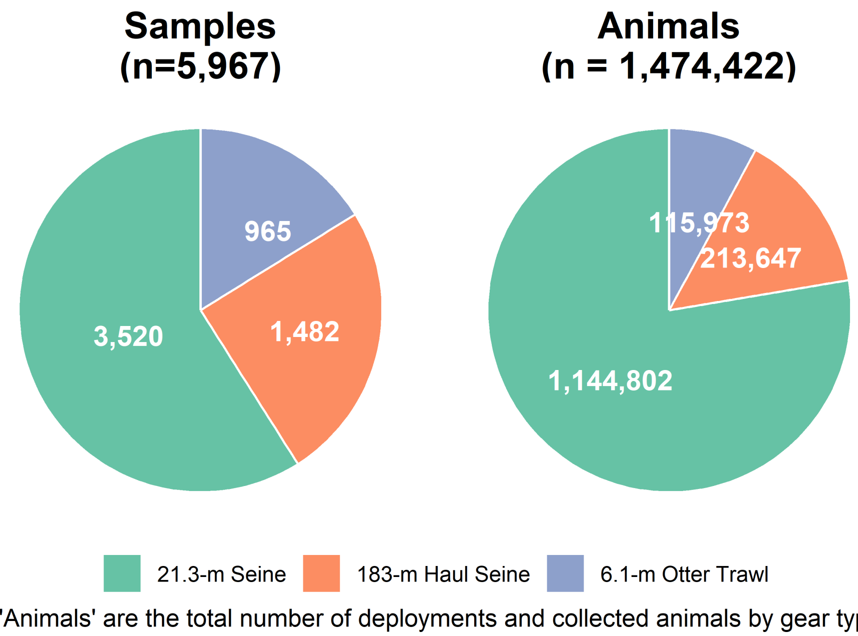

Figure 1: Summary of 2023 FIM program catch and effort data.

The top five dominant taxa were *Anchoa mitchilli*, *Eucinostomus* spp., *Lagodon rhomboides*, *Lucania parva*, and *Menidia* spp.. Recreationally and commercially important animals (i.e., Selected Taxa; see Table 4) accounted for 10.6% (n=156,960) of the overall catch and comprised between 2.2% (Tampa Bay) and 36.9% (Northeast Florida) of the total SRS catches from each estuary. The number of selected taxa appearing in the top ten abundant taxa for each estuary ranged from 1 (Sarasota Bay, Southern Indian River Lagoon) to 6 (Santa Rosa Sound; Table 5).

A total of 612 fish and selected invertebrates were culled for fish health analyses of gross external abnormalities (including external parasites). Numbers of reported abnormalities from each estuary ranged from 0 (TQ) to 502 (IR; see Chapter 6).

Species profiles, including indices of young-of-the-year relative abundance, were generated for many species of commercial, recreational, or ecological importance: *Centropomus undecimalis* (Common Snook), *Sciaenops ocellatus* (Red Drum), *Cynoscion nebulosus* (Spotted Seatrout), *Archosargus probatocephalus* (Sheepshead), *Lagodon rhomboides* (Pinfish), *Mugil cephalis* (Striped Mullet), and *Callinectes sapidus* (Blue Crab; see Section 5.1).

Table 2: Summary of catch and effort data by estuary for FIM program stratified-random sampling, 2023.

Field Lab	21.3-m Seines		183-m Haul Seines		6.1-m Otter Trawls		Totals	
	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals
Santa Rosa Sound			28	5,700			28	5,700
Choctawhatchee Bay			35	8,405			35	8,405
Apalachicola Bay	316	51,698	197	28,100	71	40,126	584	119,924
Cedar Key	403	52,612	192	13,722	39	6,923	634	73,257
Tampa Bay	722	388,646	235	49,669	144	11,705	1,101	450,020
Sarasota Bay	114	57,605	36	8,200			150	65,805
Charlotte Harbor	774	224,656	202	45,097	131	16,084	1,107	285,837
Northeast Florida	571	109,996	185	7,405	580	41,135	1,336	158,536
Northern Indian River Lagoon	416	224,350	228	25,567			644	249,917
Southern Indian River Lagoon	204	35,239	144	21,782			348	57,021

’Hauls’ are the total number of net deployments by each gear type and ’Animals’ are the total number of animals collected by each gear type.

Table 3: Top 10 numerically dominant taxa collected in FIM program stratified-random estuaries, 2023.

Bay	Scientific Name	Number
Santa Rosa Sound	*Lagodon rhomboides*	3,822
	Leiostomus xanthurus	**523**
	Orthopristis chrysoptera	351
	Bairdiella chrysoura	157
	Elops saurus	**127**
	Mugil cephalus	**92**
	Sciaenops ocellatus	**75**
	Eucinostomus harengulus	73
	Micropogonias undulatus	**72**
	Mugil curema	**52**
	Total (Top Ten)	**5,344**
	Total (Selected Taxa)	**1,057**
	Grand Total of Animals Collected	**5,700**
Choctawhatchee Bay	*Lagodon rhomboides*	4,249
	Leiostomus xanthurus	**1,110**
	Harengula jaguana	646
	Micropogonias undulatus	**645**
	Eucinostomus harengulus	392
	Mugil cephalus	**299**
	Mugil curema	**230**
	Orthopristis chrysoptera	199
	Bairdiella chrysoura	169
	Sciaenops ocellatus	**108**
	Total (Top Ten)	**8,047**
	Total (Selected Taxa)	**2,500**
	Grand Total of Animals Collected	**8,405**

Bay	Scientific Name		Number
Apalachicola Bay	*Anchoa mitchilli*		40,617
	Lagodon rhomboides		20,092
	Litopenaeus setiferus		**5,983**
	Brevoortia spp.		5,183
	Lucania parva		4,283
	Micropogonias undulatus		**4,095**
	Bairdiella chrysoura		3,942
	Leiostomus xanthurus		**3,579**
	Mugil cephalus		**3,176**
	Orthopristis chrysoptera		3,156
		Total (Top Ten)	**94,106**
		Total (Selected Taxa)	**31,121**
		Grand Total of Animals Collected	**119,924**
Cedar Key	*Anchoa mitchilli*		29,936
	Lagodon rhomboides		5,954
	Leiostomus xanthurus		**4,558**
	Menidia spp.		4,344
	Bairdiella chrysoura		2,681
	Brevoortia spp.		2,429
	Mugil cephalus		**2,046**
	Eucinostomus spp.		1,742
	Ariopsis felis		1,707
	Hypanus sabinus		1,700
		Total (Top Ten)	**57,097**
		Total (Selected Taxa)	**14,620**
		Grand Total of Animals Collected	**73,257**

Bay	Scientific Name		Number
Tampa Bay	*Anchoa mitchilli*		262,212
	Lagodon rhomboides		41,832
	Eucinostomus spp.		40,269
	Menidia spp.		22,084
	Eucinostomus gula		17,796
	Lucania parva		10,902
	Eucinostomus harengulus		9,037
	Microgobius gulosus		5,048
	Floridichthys carpio		4,648
	Bairdiella chrysoura		4,520
		Total (Top Ten)	**418,348**
		Total (Selected Taxa)	**10,122**
		Grand Total of Animals Collected	**450,020**
Sarasota Bay	*Eucinostomus* spp.		21,564
	Lucania parva		16,432
	Lagodon rhomboides		10,077
	Eucinostomus gula		4,173
	Harengula jaguana		3,073
	Menidia spp.		1,357
	Farfantepenaeus duorarum		**1,303**
	Ariopsis felis		1,105
	Floridichthys carpio		1,059
	Anchoa mitchilli		985
		Total (Top Ten)	**61,128**
		Total (Selected Taxa)	**3,119**
		Grand Total of Animals Collected	**65,805**

Bay	Scientific Name		Number
Charlotte Harbor	*Anchoa mitchilli*		82,041
	Eucinostomus spp.		54,719
	Lagodon rhomboides		34,124
	Lucania parva		25,712
	Eucinostomus gula		17,166
	Menidia spp.		9,789
	Harengula jaguana		9,353
	Eucinostomus harengulus		7,510
	Opisthonema oglinum		4,395
	Bairdiella chrysoura		3,876
		Total (Top Ten)	**248,685**
		Total (Selected Taxa)	**11,496**
		Grand Total of Animals Collected	**285,837**
Northeast Florida	*Anchoa mitchilli*		32,105
	Anchoa hepsetus		16,848
	Leiostomus xanthurus		**16,295**
	Litopenaeus setiferus		**15,156**
	Micropogonias undulatus		**12,797**
	Menidia menidia		10,975
	Fundulus heteroclitus		7,457
	Menidia spp.		5,126
	Eucinostomus spp.		3,777
	Mugil cephalus		**3,350**
		Total (Top Ten)	**123,886**
		Total (Selected Taxa)	**58,565**
		Grand Total of Animals Collected	**158,536**

Bay	Scientific Name		Number
Northern Indian River Lagoon	*Anchoa mitchilli*		163,498
	Eucinostomus spp.		14,072
	Anchoa lyolepis		8,579
	Harengula jaguana		7,143
	Diapterus auratus		6,709
	Eucinostomus harengulus		5,446
	Mugil curema		**4,022**
	Bairdiella chrysoura		3,853
	Brevoortia spp.		3,585
	Menidia spp.		2,262
		Total (Top Ten)	**219,169**
		Total (Selected Taxa)	**18,054**
		Grand Total of Animals Collected	**249,917**
Southern Indian River Lagoon	*Anchoa mitchilli*		19,986
	Diapterus auratus		5,849
	Lagodon rhomboides		5,699
	Eucinostomus spp.		3,723
	Harengula jaguana		3,286
	Menidia spp.		2,087
	Mugil curema		**1,747**
	Eucinostomus gula		1,670
	Opisthonema oglinum		1,245
	Eucinostomus harengulus		1,016
		Total (Top Ten)	**46,308**
		Total (Selected Taxa)	**6,306**
		Grand Total of Animals Collected	**57,021**

Table 4: Number of recreational or commercially important species (Selected Taxa) collected in FIM program stratified-random sampling, 2023.

Species	SR	CB	AP	CK	TB	SB	CH	JX	IR	TQ
Albula spp.	1	.	.	.	.	.	.	7	17	23
Alectis ciliaris	1	.	.	.	.	.	.	.	.	.
Archosargus probatocephalus	1	2	107	70	564	359	1,005	113	378	337
Argopecten gibbus	.	.	.	.	1	.	.	.	.	.
Argopecten irradians	.	.	2	2	5	1	.	.	.	.
Brevoortia spp.	5	5	5,183	2,429	106	1	8	925	3,585	642
Calamus arctifrons	.	.	3	1	.	.	1	.	.	.
Calamus penna	.	.	.	.	16	6	39	.	1	.
Calamus proridens	.	.	.	.	.	.	3	.	.	.
Calamus spp.	.	.	.	.	4	2	5	.	.	.
Callinectes sapidus	18	18	1,241	624	507	137	656	1,579	569	297
Caranx crysos	.	.	5	.	.	.	.	1	1	14
Caranx hippos	.	1	31	9	14	80	66	80	292	121
Carcharhinus isodon	.	.	6	.	.	.	.	1	.	.
Carcharhinus leucas	.	.	1	3	1	.	2	.	.	2
Carcharhinus limbatus	.	.	.	1	.	.	.	.	.	.
Centropomus ensiferus	.	.	.	.	.	.	.	.	11	.
Centropomus parallelus	.	.	.	.	.	.	.	2	1	7
Centropomus pectinatus	.	.	.	.	.	.	.	.	6	.
Centropomus undecimalis	.	.	1	285	1,141	239	1,296	38	778	424
Centropristis philadelphica	.	.	4	.	.	.	.	52	.	.
Centropristis striata	.	.	22	12	.	.	1	10	.	.
Cynoscion arenarius	3	.	1,449	1,082	246	.	143	.	.	.
Cynoscion complex	.	.	.	.	.	.	.	998	79	2
Cynoscion nebulosus	25	12	664	148	789	81	616	204	324	1
Cynoscion nothus	.	.	2	.	.	.	.	9	.	.
Diplectrum formosum	.	.	8	6	5	1	31	.	.	.
Elops saurus	127	5	171	266	1,615	35	218	1,256	388	478
Elops smithi	.	.	.	.	.	.	.	.	.	2

Species	SR	CB	AP	CK	TB	SB	CH	JX	IR	TQ
Epinephelus itajara	.	.	.	.	.	.	1	.	.	.
Epinephelus morio	.	.	.	.	1	.	16	.	.	.
Farfantepenaeus aztecus	.	.	57	.	.	.	.	553	43	2
Farfantepenaeus duorarum	6	1	129	60	2,310	1,303	3,834	33	25	1
Farfantepenaeus spp.	.	.	1,541	360	.	.	.	1,962	918	541
Haemulon aurolineatum	.	.	.	.	5	.	3	.	.	3
Haemulon flavolineatum	.	.	.	.	.	.	.	.	.	1
Haemulon parra	.	.	.	.	.	.	.	.	73	12
Haemulon plumierii	.	.	.	3	87	102	523	.	.	.
Haemulon sciurus	.	.	.	.	.	.	.	.	.	1
Lachnolaimus maximus	.	.	.	.	.	.	.	.	.	1
Leiostomus xanthurus	523	1,110	3,579	4,558	296	2	79	16,295	454	8
Litopenaeus setiferus	.	1	5,983	156	.	.	.	15,156	70	64
Lobotes surinamensis	.	.	2	7	2	.	.	2	2	3
Lutjanus analis	.	.	.	.	.	.	2	1	18	94
Lutjanus apodus	.	.	.	.	.	.	.	.	.	1
Lutjanus campechanus	.	.	2	.	.	.	.	.	.	.
Lutjanus cyanopterus	.	.	.	.	.	.	.	.	.	1
Lutjanus griseus	32	15	66	45	77	110	346	34	137	61
Lutjanus jocu	.	.	.	.	.	.	.	.	.	3
Lutjanus synagris	.	.	19	16	158	58	436	30	9	30
Megalops atlanticus	.	.	.	.	.	.	4	3	8	2
Menippe spp.	.	.	18	15	26	.	70	6	1	1
Menticirrhus americanus	.	1	540	722	292	.	271	331	1,039	12
Menticirrhus littoralis	.	.	9	.	22	.	.	5	.	.
Menticirrhus saxatilis	.	.	50	27	22	10	20	7	.	.
Micropogonias undulatus	72	645	4,095	162	.	.	.	12,797	1,326	276
Mugil cephalus	92	299	3,176	2,046	379	430	144	3,350	2,018	569
Mugil curema	52	230	1,030	141	114	21	72	2,088	4,022	1,747
Mugil rubrioculus	.	.	.	.	.	.	.	.	45	27
Mugil trichodon	.	.	.	211	640	61	159	.	79	.

Species	SR	CB	AP	CK	TB	SB	CH	JX	IR	TQ
Mullus auratus	.	.	1	.	.	.	.	.	.	.
Mycteroperca bonaci	.	.	.	.	.	.	1	.	.	.
Mycteroperca microlepis	.	1	11	.	47	18	97	.	1	.
Negaprion brevirostris	.	.	.	.	.	.	2	.	.	.
Ocyurus chrysurus	.	.	.	.	.	1	20	.	1	.
Paralichthys albigutta	18	32	428	185	83	1	25	71	4	3
Paralichthys dentatus	.	.	.	.	.	.	.	10	.	.
Paralichthys lethostigma	.	2	71	4	.	.	.	106	1	1
Paralichthys squamilentus	.	.	1	.	.	.	.	.	.	.
Pogonias cromis	3	.	446	362	17	6	5	29	401	80
Pomatomus saltatrix	.	1	5	10	1	.	1	13	2	11
Rachycentron canadum	.	.	2	1	2	.	.	.	.	.
Rhizoprionodon terraenovae	.	.	.	.	.	.	.	2	.	.
Sciaenops ocellatus	75	108	900	486	419	14	1,037	280	414	8
Scomberomorus maculatus	1	.	1	.	.	.	.	8	2	3
Sphyraena barracuda	2	.	3	1	14	22	36	6	20	295
Sphyrna tiburo	.	.	5	11	38	.	7	21	.	3
Trachinotus carolinus	.	2	28	2	6	5	55	69	32	51
Trachinotus falcatus	.	9	23	91	50	13	140	22	459	40
Total	**1,057**	**2,500**	**31,121**	**14,620**	**10,122**	**3,119**	**11,496**	**58,565**	**18,054**	**6,306**

Field laboratories are labeled as follows: SR (Santa Rosa Sound), CB (Choctawhatchee Bay), AP (Apalachicola Bay), CK (Cedar Key), TB (Tampa Bay), SB (Sarasota Bay), CH (Charlotte Harbor), JX (northeast Florida), IR (northern Indian River Lagoon), and TQ (southern Indian River Lagoon).

Table 5: Selected taxa among the 10 most abundant taxa in FIM program stratified-random estuaries, 2023.

Estuary	**Selected taxa among the 10 most abundant taxa:**
Santa Rosa Sound	*Leiostomus xanthurus*, *Elops saurus*, *Mugil cephalus*, *Sciaenops ocellatus*, *Micropogonias undulatus*, *Mugil curema*
Choctawhatchee Bay	*Leiostomus xanthurus*, *Micropogonias undulatus*, *Mugil cephalus*, *Mugil curema*, *Sciaenops ocellatus*
Apalachicola Bay	*Litopenaeus setiferus*, *Brevoortia* spp., *Micropogonias undulatus*, *Leiostomus xanthurus*, *Mugil cephalus*
Cedar Key	*Leiostomus xanthurus*, *Brevoortia* spp., *Mugil cephalus*
Tampa Bay	–
Sarasota Bay	*Farfantepenaeus duorarum*
Charlotte Harbor	–
Northeast Florida	*Leiostomus xanthurus*, *Litopenaeus setiferus*, *Micropogonias undulatus*, *Mugil cephalus*
Northern Indian River Lagoon	*Mugil curema*, *Brevoortia* spp.
Southern Indian River Lagoon	*Mugil curema*

Part I

Fisheries-Independent Monitoring: Core Sampling

1 Introduction

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

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

The Fish and Wildlife Research Institute initiated the FIM program in 1985 with funding provided by a Federal Sport Fish Restoration (SFR) grant. In 1988, additional funding became available from special appropriations. The FIM program is also supported, in part, by funds from the sale of Florida saltwater fishing licenses. Fisheries-Independent Monitoring program sampling began in Tampa Bay and Charlotte Harbor during 1989, in the northern IRL during 1990, in Cedar Key during 1996, in the southern IRL during 1997, in Apalachicola Bay during 1998, and in northeast Florida during 2001. Sampling was also conducted in Choctawhatchee Bay/Santa Rosa Sound between 1992 and 1997, between 2017-2019, and from 2021 to present; in Florida Bay between 1993 and 1997; and in Florida Keys National Marine Sanctuary between 1998 and 2004 (Figure 1.1). A 2013 increase in Florida saltwater fishing licenses (i.e., Snook Stamp funding) allowed the FIM program to enhance current research efforts in several bay systems (Tampa Bay, Charlotte Harbor, northern IRL, and southern IRL). In 2016, these enhancements became a permanent part of the sampling design in each of the systems.

Florida's coastline extends from temperate to subtropical regions and includes habitats such as seagrass beds, salt marshes, and mangroves. These habitats provide critical nursery areas for

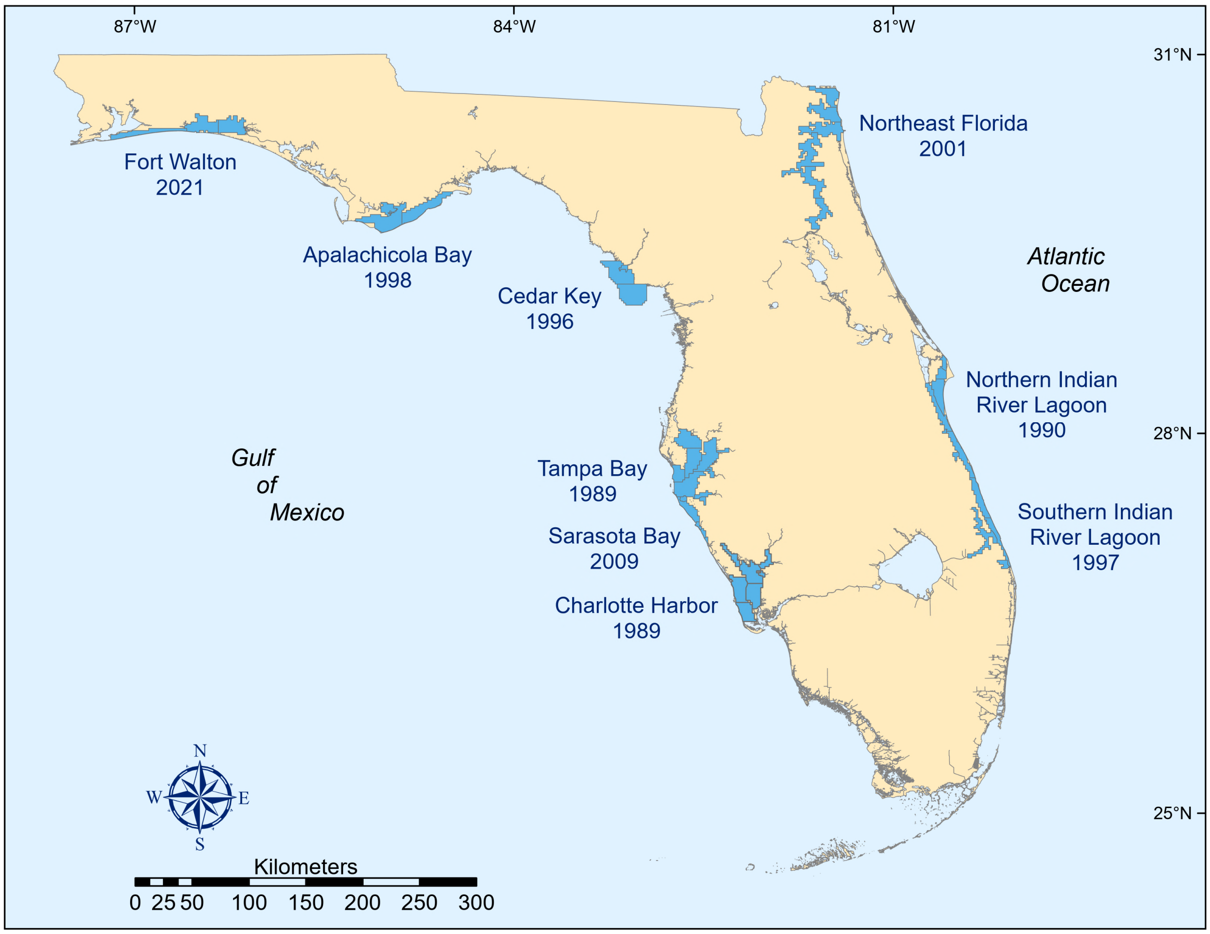

Figure 1.1: Locations of Fisheries-Independent Monitoring program field laboratories. Years indicate initiation of long-term sampling. Fort Walton includes Choctawhatchee Bay and Santa Rosa Sound.

many fish and invertebrate species. It is estimated that more than 70% of the recreationally-important species and more than 90% of the commercially-important species in the Gulf of Mexico are estuarine-dependent during at least one stage of their life histories (Lindall and Saloman 1977). The FIM program data are summarized and analyzed for all fish and selected invertebrate species collected, yielding information on the relative abundance, recruitment, habitat use, and distribution of hundreds of estuarine and marine species. This approach provides a unique source of information on economically valuable species as well as on many poorly understood non-game species that may influence fisheries or may be important ecological indicators. This type of multi-species, multi-habitat, long-term monitoring program is extremely valuable for documenting ecosystem changes, evaluating the effects of natural and anthropogenic disturbances, and making management decisions (Coull 1985; Wolfe et al. 1987).

Although the FIM program has always used a suite of gears (e.g., seines, trawls, trammel nets) capable of capturing a broad range of fish species and sizes from a variety of habitats, initial program efforts focused primarily on collecting young-of-the-year (YOY) fishes that could be used to develop recruitment indices. The program expanded its efforts to monitor larger-sized fishes in Tampa Bay by developing 183-m haul seines (fixed stations sampled between 1993 and 1995; year-round stratified-random sampling [SRS] implemented in 1996), 183-m purse seines (implemented in 1997; discontinued in 2004), and by developing a visual sampling program for reef fishes in the Florida Keys (implemented in 1998; transferred from FIM program in 2004). The 183-m haul seine was implemented as part of the SRS component of the program in Charlotte Harbor during 1996, in the northern and southern IRL and Cedar Key during 1997, in Apalachicola Bay during 1998, and in northeast Florida during 2001. The purse seine was implemented for SRS in Charlotte Harbor in 1998 and was used on a trial basis in Apalachicola Bay during 2000 and 2001, but was no longer used in any sampling area after 2004. The FIM program initiated a visual survey in the Florida Keys in 1998 to obtain important fisheries data in this unique area of Florida. In 2004, the oversight and implementation of these ongoing surveys were assigned to other FWRI work groups and are therefore no longer included in the FIM program annual summaries after 2004. The FIM program also implemented a seasonal directed sampling program for Striped Mullet (*Mugil cephalus*) in Tampa Bay and Charlotte Harbor in 1993. Directed sampling for the Striped Mullet program used a 366-m trammel net. After the 2008-2009 sampling season the seasonal directed sampling program was discontinued in both areas and has transitioned into a year-round monthly sampling survey completed every five years. In 1993, the FIM program implemented a seasonal directed sampling program in Tampa Bay for Red Drum (*Sciaenops ocellatus*) and further initiated a seasonal directed program for Red Drum in the northern IRL in 1995. The Red Drum sampling program used a 547-m trammel net. The directed sampling in the IRL was discontinued in 1999, but seasonal sampling for Red Drum in Tampa Bay continues at a reduced level.

The entire suite of gears and methods used by the FIM program captures fishes at various stages of development, from initial recruitment into the estuary through harvestable sizes, thereby providing a continuous gauge of a particular stock's relative abundance, age and size composition, and reproductive potential. This section summarizes FIM program SRS data collected during 2023. Results from the sampling efforts in each estuary are presented separately. This section also summarizes results from fish health monitoring of samples collected by the FIM program. Profiles of several species that are of particular interest, because of their recreational or commercial value in Florida, are also presented, providing critical information for these species while also describing some of the ways the FIM program data are used to assess the status of important Florida fisheries.

2 Methods

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

The FIM program uses a multi-gear approach to collect data on various life history stages of fishes and selected invertebrates from a wide variety of habitats (Table 2.1). A 21.3-m center bag seine targeted YOY and juvenile fishes in shallow water (≤1.8 m); a 6.1-m otter trawl targeted YOY, juvenile, and adult fish in deep water (1.0–7.6 m); a 183-m haul seine targeted sub-adult and adult fish along shorelines in water depths ≤2.5 m. Several different techniques were used, depending upon habitat, to stratify the samples collected with the various gears. The 21.3-m center bag seine was used in Apalachicola Bay, Cedar Key, Tampa Bay, Sarasota Bay, Charlotte Harbor, northeast Florida, and the northern IRL. In 2016, 21.3-m seine sampling was also initiated in the southern IRL system within the Loxahatchee and St. Lucie Rivers, and in tidal creeks in Charlotte Harbor. Two deployment techniques were used. The 21.3-m bay seine technique was used in all estuaries except Santa Rosa Sound, Choctawhatchee Bay, northeast Florida, and the southern IRL to sample shallow areas, and was pre-stratified by the presence or absence of bottom vegetation (except in the Cedar Key area) or the presence of a shoreline. The 21.3-m river seine technique was used in all estuaries except Santa Rosa Sound, Choctawhatchee Bay, and Sarasota Bay to sample the shorelines of creeks and rivers. River seine deployments in Tampa Bay and Charlotte Harbor's rivers were pre-stratified by the presence or absence of overhanging shoreline vegetation. River seine deployments in the northern IRL, Cedar Key, Apalachicola Bay, northeast Florida, southern IRL, and Charlotte Harbor's tidal creeks were not pre-stratified by habitat type. Samples collected with 183-m haul seines in Tampa Bay and Charlotte Harbor were pre-stratified by the presence or absence of overhanging shoreline vegetation. Samples collected with 183-m haul seines in Santa Rosa Sound, Choctawhatchee Bay, Sarasota Bay, and the northern and southern IRL were post-stratified by the presence or absence of overhanging shoreline vegetation. Samples collected with this gear were not stratified by habitat type in Apalachicola Bay, Cedar Key, and northeast Florida. All sampling was conducted during daytime hours (one hour after sunrise to one hour before sunset). Additional sampling details are described in the FIM program's Procedure Manual (FWC-FWRI 2023).

Table 2.1: Description of sampling gears used in 2023.

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

A more detailed description of each gear can be found in the FIM program's Procedure Manual

The sample work-up technique was similar for all samples, regardless of gear type or sampling regime. Environmental data consisting of water chemistry, habitat characteristics, and physical parameters, such as current and tidal conditions, were recorded for each sample. All fish and selected invertebrate species captured were identified to the lowest practical taxonomic level, counted, and a random sample of at least 10 individuals were measured (standard length for teleosts, precaudal length for sharks, disc width for rays, carapace width for crabs, and post-orbital head length for shrimp). A detailed explanation of the standard sample work-up for data collection is described in the FIM program's Procedure Manual (FWC-FWRI 2023).

Certain taxa were not identified to species because of the possibility of hybridization (e.g., *Brevoortia* spp., *Menidia* spp.) (Dahlberg 1970; Middaugh et al. 1986), or because they were morphologically or meristically indistinguishable at small juvenile sizes (e.g., *Eucinostomus* spp. <40 mm SL) (Matheson Jr. 1983). Beginning in 2017 specimens of the genus *Albula* were tested for genetic identification; however, due to the lag between sampling and testing, all specimens will be referred to as *Albula* spp. in this report. In northern and southern IRL and northeast Florida sections, species accounts of *Cynoscion regalis* (Weakfish) and *Cynoscion arenarius* (Sand Seatrout) will be referred to collectively as *Cynoscion* complex. These two species mix and hybridize along the Atlantic coast of Florida and identification can only be determined with certainty by genetic testing (Tringali et al. 2004). Animals were released except for representative samples of each taxon (for laboratory confirmation of field identifications) and samples required for specific research projects. The taxonomic nomenclature in this report follows the American Fisheries Society's Common and Scientific Names of Fishes (Page et al. 2023). Starting in 2003, shrimp belonging to the genus *Farfantepenaeus* collected in Apalachicola Bay, Cedar Key, Indian River Lagoon and northeast Florida were left at the genus level if the postorbital head length is less than 15mm due to the difficulty in separating the species at small sizes. A detailed explanation of the standard sample work-up for data collection is described in the FIM program's Procedure Manual (FWC-FWRI 2023). Data for this report were summarized separately for each estuarine system and for each gear type.

Data were also summarized separately for all taxa and for taxa of recreational or commercial importance ('Selected Taxa'; Table 2.2). Abundance estimates were calculated for 21.3-m seines and 6.1-m trawls as the number of animals/100 m^2 of area sampled. Catch-per-unit-effort (CPUE) was calculated for 183-m haul seine samples as the number of animals/set. The appendices for each study area describe the catch by month, gear, stratum, and zone.

Table 2.2: Animals designated as Selected Taxa by the Fisheries Independent Monitoring program because of their commercial or recreational importance.

Scientific Name	Common Name
Acanthocybium solandri	Wahoo
Albula goreensis	Senegalese Bonefish
Albula sp. cf. vulpes	bonefishes
Albula spp.	bonefishes
Albula vulpes	Bonefish
Alectis ciliaris	African Pompano
Alopias vulpinus	Common Thresher Shark
Alphestes afer	Mutton Hamlet
Apsilus dentatus	Black Snapper
Archosargus probatocephalus	Sheepshead
Argopecten gibbus	Atlantic Calico Scallop
Argopecten irradians	Bay Scallop
Balistes capriscus	Gray Triggerfish
Brevoortia spp.	Menhadens
Calamus arctifrons	Grass Porgy
Calamus bajonado	Jolthead Porgy
Calamus calamus	Saucereye Porgy
Calamus leucosteus	Whitebone Porgy
Calamus nodosus	Knobbed Porgy
Calamus penna	Sheepshead Porgy
Calamus proridens	Littlehead Porgy
Calamus spp.	porgies
Callinectes sapidus	Blue Crab
Caranx crysos	Blue Runner
Caranx hippos	Crevalle Jack

Scientific Name	Common Name
Carcharhinus acronotus	Blacknose Shark
Carcharhinus brevipinna	Spinner Shark
Carcharhinus falciformis	Silky Shark
Carcharhinus isodon	Finetooth Shark
Carcharhinus leucas	Bull Shark
Carcharhinus limbatus	Blacktip Shark
Carcharhinus longimanus	Oceanic Whitetip Shark
Carcharhinus obscurus	Dusky Shark
Carcharhinus plumbeus	Sandbar Shark
Caulolatilus chrysops	Goldface Tilefish
Caulolatilus cyanops	Blackline Tilefish
Caulolatilus intermedius	Anchor Tilefish
Caulolatilus microps	Blueline Tilefish
Centropomus ensiferus	Swordspine Snook
Centropomus mexicanus	Largescale Fat Snook
Centropomus parallelus	Smallscale Fat Snook
Centropomus pectinatus	Tarpon Snook
Centropomus undecimalis	Common Snook
Centropristis ocyurus	Bank Sea Bass
Centropristis philadelphica	Rock Sea Bass
Centropristis striata	Black Sea Bass
Cephalopholis cruentata	Graysby
Cephalopholis fulva	Coney
Cephalopholis furcifer	Creole-fish
Coryphaena equiselis	Pompano Dolphinfish
Coryphaena hippurus	Dolphinfish
Cynoscion arenarius	Sand Seatrout
Cynoscion complex	C. regalis x C. arenarius
Cynoscion nebulosus	Spotted Seatrout
Cynoscion nothus	Silver Seatrout
Cynoscion regalis	Atlantic Weakfish

Scientific Name	**Common Name**
Dermatolepis inermis	Marbled Grouper
Diplectrum formosum	Sand Perch
Elops saurus	Ladyfish
Elops smithi	Malacho
Epinephelus adscensionis	Rock Hind
Epinephelus guttatus	Red Hind
Epinephelus itajara	Goliath Grouper
Epinephelus morio	Red Grouper
Epinephelus striatus	Nassau Grouper
Etelis oculatus	Queen Snapper
Euthynnus alletteratus	Little Tunny
Farfantepenaeus aztecus	Brown Shrimp
Farfantepenaeus brasiliensis	Caribbean Brown Shrimp
Farfantepenaeus duorarum	Pink Shrimp
Farfantepenaeus spp.	Commercial Shrimps
Galeocerdo cuvier	Tiger Shark
Ginglymostoma cirratum	Nurse Shark
Haemulon album	Margate
Haemulon aurolineatum	Tomtate
Haemulon flavolineatum	French Grunt
Haemulon macrostoma	Spanish Grunt
Haemulon melanurum	Cottonwick
Haemulon parra	Sailors Choice
Haemulon plumierii	White Grunt
Haemulon sciurus	Bluestriped Grunt
Hyporthodus drummondhayi	Speckled Hind
Hyporthodus flavolimbatus	Yellowedge Grouper
Hyporthodus mystacinus	Misty Grouper
Hyporthodus nigritus	Warsaw Grouper
Hyporthodus niveatus	Snowy Grouper
Istiophorus platypterus	Sailfish

Scientific Name	Common Name
Isurus oxyrinchus	Shortfin Mako
Katsuwonus pelamis	Skipjack Tuna
Lachnolaimus maximus	Hogfish
Lamna nasus	Porbeagle
Leiostomus xanthurus	Spot
Litopenaeus setiferus	White Shrimp
Lobotes surinamensis	Atlantic Tripletail
Lopholatilus chamaeleonticeps	Tilefish
Lutjanus analis	Mutton Snapper
Lutjanus apodus	Schoolmaster
Lutjanus buccanella	Blackfin Snapper
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
Malacanthus plumieri	Sand Tilefish
Megalops atlanticus	Tarpon
Menippe spp.	Stone Crab
Menticirrhus americanus	Southern Kingfish
Menticirrhus littoralis	Gulf Kingfish
Menticirrhus saxatilis	Northern Kingfish
Micropogonias undulatus	Atlantic Croaker
Mugil cephalus	Striped Mullet
Mugil curema	White Mullet
Mugil liza	Liza
Mugil rubrioculus	Redeye Mullet
Mugil trichodon	Fantail Mullet
Mulloidichthys martinicus	Yellow Goatfish

Scientific Name	Common Name
Mullus auratus	Red Goatfish
Mustelus spp.	hound sharks
Mycteroperca bonaci	Black Grouper
Mycteroperca interstitialis	Yellowmouth Grouper
Mycteroperca microlepis	Gag
Mycteroperca phenax	Scamp
Mycteroperca tigris	Tiger Grouper
Mycteroperca venenosa	Yellowfin Grouper
Negaprion brevirostris	Lemon Shark
Ocyurus chrysurus	Yellowtail Snapper
Pagrus pagrus	Red Porgy
Panulirus argus	Spiny Lobster
Paralichthys albigutta	Gulf Flounder
Paralichthys dentatus	Summer Flounder
Paralichthys lethostigma	Southern Flounder
Paralichthys oblongus	Fourspot Flounder
Paralichthys squamilentus	Broad Flounder
Pogonias cromis	Black Drum
Pomatomus saltatrix	Bluefish
Prionace glauca	Blue Shark
Pristipomoides aquilonaris	Wenchman
Pseudupeneus maculatus	Spotted Goatfish
Pterois spp.	Lionfishes
Rachycentron canadum	Cobia
Rhizoprionodon terraenovae	Atlantic Sharpnose Shark
Rhomboplites aurorubens	Vermilion Snapper
Sciaenops ocellatus	Red Drum
Scomberomorus cavalla	King Mackerel
Scomberomorus maculatus	Spanish Mackerel
Scomberomorus regalis	Cero
Seriola dumerili	Greater Amberjack

Scientific Name	**Common Name**
Seriola fasciata	Lesser Amberjack
Seriola rivoliana	Almaco Jack
Seriola zonata	Banded Rudderfish
Sphyraena barracuda	Great Barracuda
Sphyrna tiburo	Bonnethead
Thunnus albacares	Yellowfin Tuna
Thunnus atlanticus	Blackfin Tuna
Thunnus obesus	Bigeye Tuna
Thunnus thynnus	Bluefin Tuna
Trachinotus carolinus	Florida Pompano
Trachinotus falcatus	Permit
Trachinotus goodei	Palometa
Upeneus parvus	Dwarf Goatfish

3 Study Areas

The FIM program conducted sampling in the following estuarine areas: Fort Walton including Santa Rosa Sound and Choctawhatchee Bay, Apalachicola Bay, Cedar Key, Tampa Bay, Sarasota Bay, Charlotte Harbor, northeast Florida, and the northern and southern portions of the Indian River Lagoon (Figure 1.1). Sampling was conducted over a wide range of habitats encompassing different bottom types, shoreline types, and offshore areas. In addition to sampling in major estuaries, tidally-influenced portions of rivers that flow into Tampa Bay (Alafia, Braden, Little Manatee, and Manatee Rivers), Charlotte Harbor (Peace and Myakka rivers, Alligator Creek), the Indian River Lagoon (Turkey Creek, St. Sebastian, Loxahatchee, and St. Lucie rivers), the Cedar Key area (Suwannee River), Apalachicola Bay (Apalachicola River), and northeast Florida (St. Marys, Nassau, and St. Johns rivers) were also sampled. The Tampa Bay, Charlotte Harbor, and northern IRL study areas were described in the FIM Program 1994 Annual Data Summary Report (FDEP-FMRI 1995). The Cedar Key study area was described in the FIM Program 1996 Annual Data Summary Report (FDEP-FMRI 1997); the southern IRL study area was described in the FIM Program 1997 Annual Data Summary Report (FDEP-FMRI 1998); the Apalachicola Bay study area and updates to the southern IRL study area were described in the FIM Program 1998 Annual Data Summary Report (FDEP-FMRI 1999); the northeast Florida study area was described in the FIM Program 2001 Annual Data Summary Report (FDEP-FMRI 2002); and expansion of 21.3-m seines in the southern IRL area is described later in this report (Section 4.10).

4 Data Summary by Estuary

4.1 Santa Rosa Sound

Santa Rosa Sound is a 109-km^2 lagoon connecting Pensacola Bay to the west and Choctawhatchee Bay to the east (Northwest Florida Water Management District 2017a). The lagoon has no tidal tributaries for direct freshwater input but is connected to the Gulf of Mexico by a deep pass west of Santa Rosa Island. Shoreline vegetation consists primarily of the marsh grasses *Spartina alterniflora* and *Panicum hemitomon* (Miller et al. 2001). Bottom substrate is mostly sand (Miller et al. 2001) and bottom vegetation consists primarily of seagrasses such as *Halodule wrightii* and *Thalassia testudinum* (Bradley and Houser 2009). Seagrass beds covered nearly 25% of the lagoon in 1960, but by 1992 less than half remained because of wastewater discharge, dredging, and beach modifications (Handley et al. 2007). By 2010, seagrass coverage declined by an additional 5% (Yarbro and Carlson 2016).

The Santa Rosa Sound sampling universe consists of a single bay zone (Zone A; Figure 4.1). Monthly stratified-random sampling (SRS) occurred in Santa Rosa Sound from June to December using 183-m haul seines. All methods were the same as those described in Chapter 2. Below is a summary of fisheries-independent monitoring effort and catch in Santa Rosa Sound during 2023.

Stratified-Random Sampling

A total of 5,700 animals, which included 44 taxa of fishes and 2 taxa of selected invertebrates, were collected from 28 Santa Rosa Sound SRS samples in 2023 (Table 4.1, Table A.1, Table A.2, Table A.3). *Lagodon rhomboides* (n=3,822) was the most numerous taxon collected, representing 67.1% of the total catch. *Leiostomus xanthurus* (n=523) and *Orthopristis chrysoptera* (n=351) were the next most abundant taxa collected, accounting for an additional 15.3% of the total catch. A total of 19 selected taxa (n=1,057 animals) composed 18.5% of the total catch. *Leiostomus xanthurus* (n=523) was the most abundant Selected Taxon, representing 9.2% of the total catch. *Elops saurus* (n=127), *Mugil cephalus* (n=92), *Sciaenops ocellatus* (n=75), and *Micropogonias undulatus* (n=72) were the next most abundant selected taxa, comprising 6.4% of the total catch. Collections in 2023 included 0 species new to the Santa Rosa FIM collection.

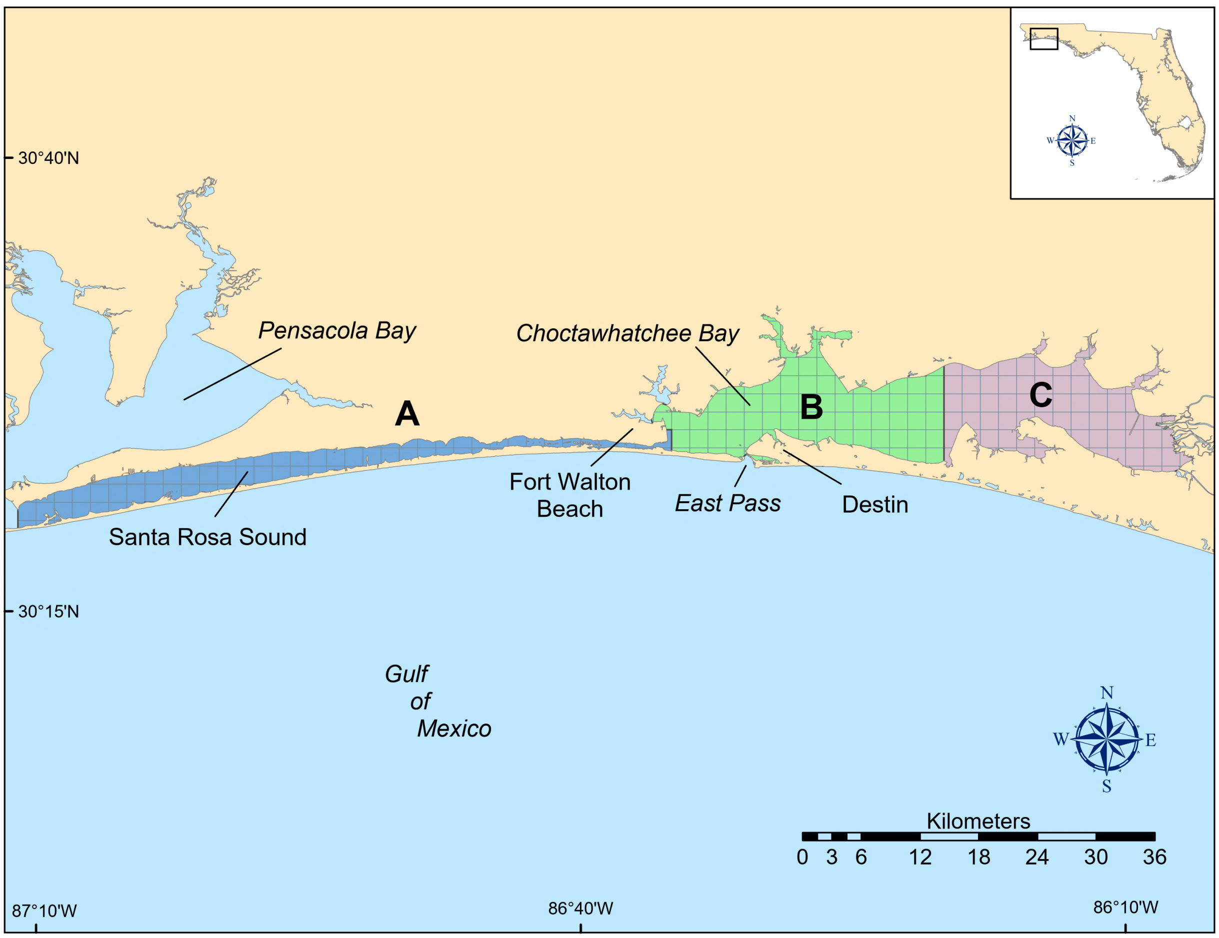

Figure 4.1: Map of Fort Walton sampling area, including Santa Rosa Sound. Zones are labeled A-C. Santa Rosa Sound consists only of Zone A.

Table 4.1: Summary of catch and effort data for Santa Rosa Sound stratified-random sampling, 2023.

Zone	183-m haul seine		Totals	
	Animals	Hauls	Animals	Hauls
A	5,700	28	5,700	28
Totals	**5,700**	**28**	**5,700**	**28**

Bay Sampling

183-m Haul Seines

A total of 5,700 animals were collected in 28 183-m haul seines, representing 100% of the overall SRS catch (Table 4.1). Lagodon rhomboides (n = 3,822) and Leiostomus xanthurus (n = 523) were the most abundant taxa, accounting for 76.2% of the haul seine catch (Table 4.2). The taxa most frequently caught in 183-m haul seines were *Lagodon rhomboides* (92.9% occurrence) and *Leiostomus xanthurus* (64.3% occurrence).

A total of 1,057 animals from 19 selected taxa were collected, representing 18.5% of the entire 183-m haul seine catch (Table 4.3). Leiostomus xanthurus (n=523) was the most abundant Selected Taxon, accounting for 49.5% of the selected taxa collected by this gear. The selected taxa most frequently caught in 183-m haul seines were *Leiostomus xanthurus* (64.3% occurrence) and *Sciaenops ocellatus* (64.3% occurrence).

Table 4.2: Catch statistics for 10 dominant taxa collected in 28 183-m haul seine samples during Santa Rosa Sound stratified-random sampling, 2023.

	Number			**Density Estimate (animals/set)**				**Standard Length (mm)**			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	3,822	67.1	92.9	136.50	29.78	115.45	777	115	0.42	64	198
Leiostomus xanthurus	523	9.2	64.3	18.68	7.24	205.10	177	142	1.20	74	265
Orthopristis chrysoptera	351	6.2	46.4	12.54	4.27	180.22	99	123	1.68	76	215
Bairdiella chrysoura	157	2.8	28.6	5.61	2.55	240.37	44	125	1.19	96	168
Elops saurus	127	2.2	25.0	4.54	2.65	308.92	64	253	2.03	145	341
Mugil cephalus	92	1.6	57.1	3.29	1.16	186.49	30	286	7.01	105	394
Sciaenops ocellatus	75	1.3	64.3	2.68	0.85	168.21	15	355	20.34	117	798
Eucinostomus harengulus	73	1.3	50.0	2.61	0.91	185.67	21	94	1.02	74	117
Micropogonias undulatus	72	1.3	21.4	2.57	1.64	336.78	44	177	3.26	120	245
Mugil curema	52	0.9	50.0	1.86	0.69	195.37	16	142	3.39	97	264
Subtotals	5,344	93.9	.	.	.	.	.	.	.	64	798
Totals	**5,700**	**100.0**	**.**	**203.57**	**41.85**	**108.79**	**1,051**	**.**	**.**	**17**	**798**

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.

Table 4.3: Catch statistics for selected taxa collected in 28 183-m haul seine samples during Santa Rosa Sound stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Leiostomus xanthurus	523	9.2	64.3	18.68	7.24	205.10	177	142	1.20	74	265
Elops saurus	127	2.2	25.0	4.54	2.65	308.92	64	253	2.03	145	341
Mugil cephalus	92	1.6	57.1	3.29	1.16	186.49	30	286	7.01	105	394
Sciaenops ocellatus	75	1.3	64.3	2.68	0.85	168.21	15	355	20.34	117	798
Micropogonias undulatus	72	1.3	21.4	2.57	1.64	336.78	44	177	3.26	120	245
Mugil curema	52	0.9	50.0	1.86	0.69	195.37	16	142	3.39	97	264
Lutjanus griseus	32	0.6	21.4	1.14	0.78	360.15	21	195	6.86	127	250
Cynoscion nebulosus	25	0.4	21.4	0.89	0.54	317.28	14	269	19.65	110	466
Callinectes sapidus	18	0.3	28.6	0.64	0.29	236.53	7	104	8.15	33	166
Paralichthys albigutta	18	0.3	35.7	0.64	0.23	185.58	5	174	12.00	97	275
Farfantepenaeus duorarum	6	0.1	7.1	0.21	0.18	446.48	5	20	1.58	17	26
Brevoortia spp.	5	0.1	7.1	0.18	0.13	375.00	3	95	6.58	78	115
Cynoscion arenarius	3	0.1	3.6	0.11	0.11	529.15	3	250	0.00	250	250
Pogonias cromis	3	0.1	10.7	0.11	0.06	293.97	1	259	15.90	241	291
Sphyraena barracuda	2	<0.1	3.6	0.07	0.07	529.15	2	286	9.00	277	295
Albula spp.	1	<0.1	3.6	0.04	0.04	529.15	1	400	.	400	400
Alectis ciliaris	1	<0.1	3.6	0.04	0.04	529.15	1	74	.	74	74
Archosargus probatocephalus	1	<0.1	3.6	0.04	0.04	529.15	1	355	.	355	355
Scomberomorus maculatus	1	<0.1	3.6	0.04	0.04	529.15	1	326	.	326	326

Species	Number			Density Estimate (animals/set)				Standard Length (mm)			
	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Totals	**1,057**	**18.5**	**.**	**37.75**	**9.30**	**130.33**	**199**	**.**	**.**	**17**	**798**

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.

4.2 Choctawhatchee Bay

Choctawhatchee Bay is a 334-km^2 estuary located in the central Florida Panhandle that is connected to the Gulf of Mexico by a shallow man-made channel, East Pass, near the city of Destin Handley et al. (2007). Choctawhatchee Bay seagrass beds covered 17.2 km^2 in 1992 but had declined by 55% by 2007 (Yarbro and Carlson 2016). Seagrass losses observed in Choctawhatchee Bay are a result of urbanization, especially the construction of seawalls, which reduces the size of intertidal areas and impedes seagrass growth (Handley et al. 2007).

Choctawhatchee Bay is highly stratified, and its salinity is driven primarily by freshwater inflow from the Choctawhatchee River (Brown and Hemming 2004; Northwest Florida Water Management District 2017b). Major habitat types in the Choctawhatchee River include shoreline snags, tributary valley lakes, spring runs, and tidal marshes. The river is bordered by hardwood swamps in its upper reaches and stands of *Spartina cynosuroides* in its lower reaches (Northwest Florida Water Management District 2017b).

The Choctawhatchee Bay sampling universe consists of two bay zones (B and C; Figure 4.2). Monthly stratified-random sampling (SRS) occurred from June to December in bay zones B and C using 183-m haul seines. All methods were the same as those described in Chapter 2. Below is a summary of fisheries-independent monitoring effort and catch in Choctawhatchee Bay during 2023.

Stratified-Random Sampling

A total of 8,405 animals, which included 42 taxa of fishes and 3 taxa of selected invertebrates, were collected from 35 Choctawhatchee Bay SRS samples in 2023 (Table 4.4, Table A.4, Table A.5, Table A.6). *Lagodon rhomboides* (n=4,249) was the most numerous taxon collected, representing 50.6% of the total catch. *Leiostomus xanthurus* (n=1,110) and *Harengula jaguana* (n=646) were the next most abundant taxa collected, accounting for an additional 20.9% of the total catch. A total of 21 selected taxa (n=2,500 animals) composed 29.7% of the total catch. *Leiostomus xanthurus* (n=1,110) was the most abundant Selected Taxon, representing 13.2% of the total catch. *Micropogonias undulatus* (n=645), *Mugil cephalus* (n=299), *Mugil curema* (n=230), and *Sciaenops ocellatus* (n=108) were the next most abundant selected taxa, comprising 15.3% of the total catch. Collections in 2023 included 0 species new to the Choctawhatchee Bay FIM collection.

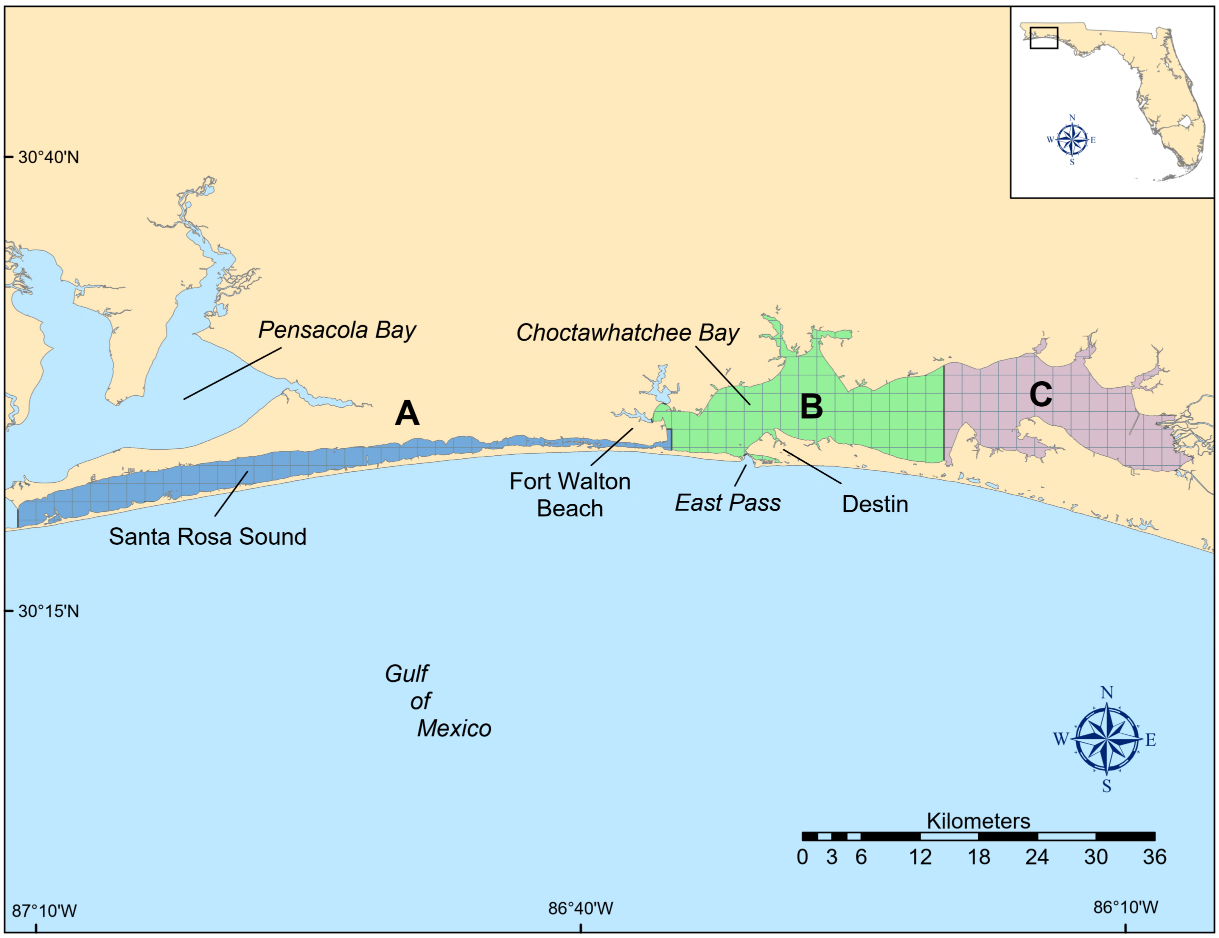

Figure 4.2: Map of Fort Walton sampling area, including Choctawhatchee Bay. Zones are labeled A-C. Choctawhatchee Bay comprises zones B and C.

Table 4.4: Summary of catch and effort data for Choctawhatchee Bay stratified-random sampling, 2023.

Zone	183-m haul seine		Totals	
	Animals	Hauls	Animals	Hauls
B	5,409	21	5,409	21
C	2,996	14	2,996	14
Totals	**8,405**	**35**	**8,405**	**35**

Bay Sampling

183-m Haul Seines

A total of 8,405 animals were collected in 35 183-m haul seines, representing 100% of the overall SRS catch (Table 4.4). Lagodon rhomboides (n = 4,249) and Leiostomus xanthurus (n = 1,110) were the most abundant taxa, accounting for 63.8% of the haul seine catch (Table 4.5). The taxa most frequently caught in 183-m haul seines were *Lagodon rhomboides* (88.6% occurrence) and *Leiostomus xanthurus* (74.3% occurrence).

A total of 2,500 animals from 21 selected taxa were collected, representing 29.7% of the entire 183-m haul seine catch (Table 4.6). Leiostomus xanthurus (n=1,110) was the most abundant Selected Taxon, accounting for 44.4% of the selected taxa collected by this gear. The selected taxa most frequently caught in 183-m bay seines were *Leiostomus xanthurus* (74.3% occurrence) and *Mugil cephalus* (71.4% occurrence).

Table 4.5: Catch statistics for 10 dominant taxa collected in 35 183-m haul seine samples during Choctawhatchee Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	4,249	50.6	88.6	121.40	37.82	184.29	1,295	122	0.34	62	167
Leiostomus xanthurus	1,110	13.2	74.3	31.71	9.20	171.69	281	132	0.79	68	245
Harengula jaguana	646	7.7	8.6	18.46	17.62	564.74	617	102	0.27	86	127
Micropogonias undulatus	645	7.7	34.3	18.43	9.23	296.32	272	141	0.74	100	252
Eucinostomus harengulus	392	4.7	54.3	11.20	5.13	271.20	175	105	0.44	79	148
Mugil cephalus	299	3.6	71.4	8.54	3.11	215.38	92	184	3.40	105	379
Mugil curema	230	2.7	60.0	6.57	1.78	160.42	40	164	2.51	79	307
Orthopristis chrysoptera	199	2.4	34.3	5.69	3.38	352.09	117	129	1.47	29	202
Bairdiella chrysoura	169	2.0	11.4	4.83	4.17	510.95	145	141	2.49	32	163
Sciaenops ocellatus	108	1.3	51.4	3.09	0.67	129.00	11	236	14.14	109	854
Subtotals	8,047	95.9	.	.	.	.	.	.	.	29	854
Totals	**8,405**	**100.0**	**.**	**240.14**	**55.06**	**135.64**	**1,741**	**.**	**.**	**15**	**854**

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.

Table 4.6: Catch statistics for selected taxa collected in 35 183-m haul seine samples during Choctawhatchee Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Leiostomus xanthurus	1,110	13.2	74.3	31.71	9.20	171.69	281	132	0.79	68	245
Micropogonias undulatus	645	7.7	34.3	18.43	9.23	296.32	272	141	0.74	100	252
Mugil cephalus	299	3.6	71.4	8.54	3.11	215.38	92	184	3.40	105	379
Mugil curema	230	2.7	60.0	6.57	1.78	160.42	40	164	2.51	79	307
Sciaenops ocellatus	108	1.3	51.4	3.09	0.67	129.00	11	236	14.14	109	854
Paralichthys albigutta	32	0.4	37.1	0.91	0.32	207.81	9	148	11.10	84	398
Callinectes sapidus	18	0.2	25.7	0.51	0.18	202.14	4	138	8.40	55	189
Lutjanus griseus	15	0.2	20.0	0.43	0.18	248.53	5	151	6.72	112	185
Cynoscion nebulosus	12	0.1	22.9	0.34	0.12	211.54	3	278	39.87	142	534
Trachinotus falcatus	9	0.1	5.7	0.26	0.19	435.74	6	279	12.63	210	315
Brevoortia spp.	5	0.1	11.4	0.14	0.07	300.98	2	100	12.73	72	133
Elops saurus	5	0.1	8.6	0.14	0.08	345.56	2	292	29.78	235	402
Archosargus probatocephalus	2	<0.1	5.7	0.06	0.04	412.13	1	297	45.00	252	342
Paralichthys lethostigma	2	<0.1	2.9	0.06	0.06	591.61	2	184	10.50	173	194
Trachinotus carolinus	2	<0.1	5.7	0.06	0.04	412.13	1	125	25.00	100	150
Caranx hippos	1	<0.1	2.9	0.03	0.03	591.61	1	108	.	108	108
Farfantepenaeus duorarum	1	<0.1	2.9	0.03	0.03	591.61	1	15	.	15	15
Litopenaeus setiferus	1	<0.1	2.9	0.03	0.03	591.61	1	35	.	35	35
Menticirrhus americanus	1	<0.1	2.9	0.03	0.03	591.61	1	143	.	143	143

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mycteroperca microlepis	1	<0.1	2.9	0.03	0.03	591.61	1	203	.	203	203
Pomatomus saltatrix	1	<0.1	2.9	0.03	0.03	591.61	1	348	.	348	348
Totals	**2,500**	**29.7**	**.**	**71.43**	**14.73**	**122.03**	**403**	**.**	**.**	**15**	**854**

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.

4.3 Apalachicola Bay

Apalachicola Bay is a shallow, semi-enclosed estuary, located on the northwestern coast of Florida. The estuary, bounded by a barrier island complex (St. Vincent Island, Little St. George Island, St. George Island, and Dog Island), is connected to the Gulf of Mexico through four passes (Indian Pass, West Pass, East Pass, and Sikes Cut). East of Dog Island, St. George Sound is open to the Gulf (Figure 4.3). Freshwater inflow to Apalachicola Bay primarily comes from the Apalachicola River and to a lesser extent the Carrabelle River (Livingston 1983). Shoreline vegetation consists largely of marsh grasses and bottom substrates are typically characterized as sand or mud with oyster beds scattered throughout the bay (Ingle and Dawson 1953). Less than 7% of the substrate is covered by seagrass (Continental Shelf Associates, Inc. 1985a).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in Apalachicola Bay since 1998. The area sampled was divided into two geographically defined bay zones (A and B) and one riverine zone (C; Figure 4.3). Stratified-random sampling (SRS) was conducted in Zones A and B monthly using 21.3-m bay seines and 183-m haul seines and quarterly using 6.1-m bay otter trawls. SRS was conducted in Zone C monthly with 21.3-m river seines and bimonthly with 6.1-m river otter trawls. All methods were the same as those described in Chapter 2. This section summarizes data collected by the FIM program during 2023 in Apalachicola Bay.

Stratified-Random Sampling

A total of 119,924 animals, which included 180 taxa of fishes and 18 taxa of selected invertebrates, were collected from 594 Apalachicola Bay SRS samples in 2023 (Table 4.7, Table A.7, Table A.8, Table A.9). *Anchoa mitchilli* (n=40,617) was the most numerous taxon collected, representing 33.9% of the total catch. *Lagodon rhomboides* (n=20,092) and *Litopenaeus setiferus* (n=5,983) were the next most abundant taxa collected, accounting for an additional 21.7% of the total catch. A total of 47 selected taxa (n=31,121 animals) composed 26% of the total catch. *Litopenaeus setiferus* (n=5,983) was the most abundant Selected Taxon, representing 5% of the total catch. *Brevoortia* spp. (n=5,183) and *Micropogonias undulatus* (n=4,095) were the next most abundant selected taxa, comprising 7.7% of the total catch. Collections in 2023 included 3 species new to the Apalachicola Bay FIM collection: *Centropomus undecimalis, Gerres cinereus, Pareques umbrosus*.

Figure 4.3: Map of Apalachicola Bay sampling area. Zones are labeled A-C. Zones A and B are bay zones, while zone C is a river zone.

Table 4.7: Summary of catch and effort data for Apalachicola Bay stratified-random sampling, 2023.

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	32,065	120	.	.	13,866	99	4,833	24	50,764	243
B	12,989	120	.	.	14,234	99	3,596	24	30,819	243
C	.	.	6,644	84	.	.	31,697	24	38,341	108
Totals	**45,054**	**240**	**6,644**	**84**	**28,100**	**198**	**40,126**	**72**	**119,924**	**594**

Bay Sampling

21.3-m Bay Seines

A total of 45,054 animals were collected in 240 21.3-m bay seines, representing 37.6% of the overall SRS catch (Table 4.7). Lagodon rhomboides (n=9,765) and Anchoa mitchilli (n=6,725) were the most abundant taxa, accounting for 36.6% of the bay seine catch (Table 4.8). The taxa most frequently caught in 21.3-m bay seines were *Farfantepenaeus* spp. (56.7% occurrence) and *Lagodon rhomboides* (54.2% occurrence).

A total of 13,636 animals from 30 selected taxa were collected, representing 30.3% of the entire 21.3-m bay seine catch (Table 4.9). Brevoortia spp. (n=3,407) was the most abundant Selected Taxon, accounting for 25% of the selected taxa collected by this gear. The selected taxa most frequently caught in 21.3-m bay seines were *Farfantepenaeus* spp. (56.7% occurrence) and *Leiostomus xanthurus* (31.2% occurrence).

Table 4.8: Catch statistics for 10 dominant taxa collected in 240 21.3-m bay seine samples during Apalachicola Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	9,765	21.7	54.2	28.59	6.41	350.23	952.86	34	0.16	9	147
Anchoa mitchilli	6,725	14.9	35.8	20.01	3.89	301.05	344.29	34	0.12	13	67
Lucania parva	3,794	8.4	12.5	11.29	4.90	671.81	1,037.86	25	0.07	15	47
Brevoortia spp.	3,407	7.6	8.3	10.14	8.59	1,313.16	2,059.29	29	0.08	18	95
Litopenaeus setiferus	2,644	5.9	19.2	7.87	1.85	363.75	187.14	10	0.07	2	32
Menidia spp.	2,254	5.0	42.9	6.71	1.33	306.24	165.71	50	0.29	20	98
Bairdiella chrysoura	2,226	4.9	22.1	6.57	2.60	616.09	564.29	39	0.30	11	155
Orthopristis chrysoptera	2,163	4.8	24.2	6.41	2.00	484.67	357.86	34	0.36	11	180
Micropogonias undulatus	1,753	3.9	18.8	5.22	2.54	755.40	545.71	22	0.34	12	193
Farfantepenaeus spp.	1,326	2.9	56.7	3.95	0.75	293.87	137.86	8	0.07	2	14
Subtotals	36,057	80.0	.	.	.	.	.	.	.	2	193
Totals	**45,053**	**100.0**	**.**	**134.09**	**14.75**	**170.43**	**2,301.43**	**.**	**.**	**2**	**552**

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.

Table 4.9: Catch statistics for selected taxa collected in 240 21.3-m bay seine samples during Apalachicola Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Brevoortia spp.	3,407	7.6	8.3	10.14	8.59	1,313.16	2,059.29	29	0.08	18	95
Litopenaeus setiferus	2,644	5.9	19.2	7.87	1.85	363.75	187.14	10	0.07	2	32
Micropogonias undulatus	1,753	3.9	18.8	5.22	2.54	755.40	545.71	22	0.34	12	193
Farfantepenaeus spp.	1,326	2.9	56.7	3.95	0.75	293.87	137.86	8	0.07	2	14
Mugil cephalus	1,174	2.6	11.2	3.49	1.39	618.14	222.86	27	0.32	12	189
Leiostomus xanthurus	1,080	2.4	31.2	3.21	0.62	298.99	92.14	30	0.61	9	195
Callinectes sapidus	481	1.1	29.6	1.43	0.29	313.92	46.43	15	0.70	3	136
Cynoscion arenarius	464	1.0	14.6	1.38	0.35	397.61	50.71	27	0.44	11	67
Menticirrhus americanus	391	0.9	16.2	1.16	0.34	452.31	56.43	31	0.69	12	109
Cynoscion nebulosus	335	0.7	21.7	0.99	0.25	388.50	45.71	45	1.14	17	139
Sciaenops ocellatus	213	0.5	19.2	0.63	0.17	425.86	29.29	45	4.64	12	540
Mugil curema	105	0.2	5.0	0.31	0.17	853.32	30.71	49	1.52	21	96
Paralichthys albigutta	79	0.2	16.2	0.24	0.04	279.98	4.29	38	3.46	10	207
Lutjanus griseus	50	0.1	7.1	0.15	0.04	436.43	5.00	35	2.50	13	97
Menticirrhus saxatilis	50	0.1	3.3	0.15	0.09	898.58	17.86	24	1.35	12	52
Farfantepenaeus duorarum	19	<0.1	5.4	0.06	0.02	526.33	3.57	16	0.40	15	20
Paralichthys lethostigma	12	<0.1	1.2	0.04	0.02	1,046.21	5.00	21	2.52	14	34
Pogonias cromis	10	<0.1	2.5	0.03	0.02	844.38	3.57	217	11.41	130	270
Archosargus probatocephalus	9	<0.1	2.9	0.03	0.01	613.80	1.43	93	35.92	20	324

Species	Number No.	%	% Occur	Density Estimate (animals/100m^2) Mean	Stderr	CV	Max	Standard Length (mm) Mean	Stderr	Min	Max
Trachinotus carolinus	7	<0.1	1.7	0.02	0.01	793.32	1.43	62	12.04	18	90
Farfantepenaeus aztecus	6	<0.1	2.1	0.02	0.01	724.93	1.43	18	1.23	15	23
Lutjanus synagris	6	<0.1	1.2	0.02	0.01	962.91	2.14	42	6.53	24	71
Centropristis striata	4	<0.1	1.2	0.01	0.01	945.37	1.43	59	8.86	44	77
Menticirrhus littoralis	4	<0.1	0.8	0.01	0.01	1,223.21	2.14	73	16.85	52	123
Diplectrum formosum	2	<0.1	0.8	0.01	<0.01	1,093.15	0.71	72	18.00	54	90
Argopecten irradians	1	<0.1	0.4	<0.01	<0.01	1,549.19	0.71	15	.	15	15
Caranx hippos	1	<0.1	0.4	<0.01	<0.01	1,549.19	0.71	36	.	36	36
Elops saurus	1	<0.1	0.4	<0.01	<0.01	1,549.19	0.71	41	.	41	41
Mycteroperca microlepis	1	<0.1	0.4	<0.01	<0.01	1,549.19	0.71	208	.	208	208
Trachinotus falcatus	1	<0.1	0.4	<0.01	<0.01	1,549.19	0.71	22	.	22	22
Totals	**13,636**	**30.3**	**.**	**40.58**	**10.22**	**390.15**	**2,265.71**	**.**	**.**	**2**	**540**

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.

183-m Haul Seines

A total of 28,100 animals were collected in 198 183-m haul seines, representing 23.4% of the overall SRS catch (Table 4.7. Lagodon rhomboides (n=9,900) was the most abundant taxon, accounting for 35.2% of the 183-m haul seine catch (Table 4.10). The taxa most frequently caught in 183-m haul seines were *Lagodon rhomboides* (77.8% occurrence), *Mugil cephalus* (75.8% occurrence), and *Hypanus sabinus* (69.7% occurrence).

A total of 11,934 animals from 37 selected taxa were collected, representing 42.5% of the entire 183-m haul seine catch (Table 4.11). Litopenaeus setiferus (n=2,189) and Leiostomus xanthurus (n=2,039) were the most abundant selected taxa, accounting for 35.4% of the selected taxa collected by this gear. The selected taxa most frequently caught in 183-m haul seines were *Mugil cephalus* (75.8% occurrence) and *Sciaenops ocellatus* (67.2% occurrence).

Table 4.10: Catch statistics for 10 dominant taxa collected in 198 183-m haul seine samples during Apalachicola Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	9,900	35.2	77.8	49.75	6.14	174.13	589	108	0.25	30	203
Litopenaeus setiferus	2,189	7.8	7.6	11.06	8.31	1,057.54	1,563	20	0.05	10	36
Leiostomus xanthurus	2,039	7.3	57.6	10.30	1.62	221.62	158	132	0.80	48	266
Mugil cephalus	2,001	7.1	75.8	10.11	1.62	225.86	231	225	1.67	60	505
Hypanus sabinus	1,679	6.0	69.7	8.48	1.43	237.95	232	226	0.90	86	364
Micropogonias undulatus	1,531	5.4	30.3	7.73	1.94	353.36	224	160	0.55	76	267
Bairdiella chrysoura	1,488	5.3	31.3	7.52	2.18	407.86	333	131	0.42	30	169
Mugil curema	925	3.3	36.4	4.67	2.30	691.84	447	168	1.23	59	293
Stomolophus meleagris	883	3.1	2.5	4.46	4.11	1,295.24	811	41	0.67	20	170
Brevoortia spp.	852	3.0	8.6	4.30	2.67	872.04	455	100	1.04	61	215
Subtotals	23,487	83.5	.	.	.	.	.	.	.	10	505
Totals	**28,100**	**100.0**	**.**	**141.92**	**13.98**	**138.57**	**1,591**	**.**	**.**	**5**	**1,052**

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.

Table 4.11: Catch statistics for selected taxa collected in 198 183-m haul seine samples during Apalachicola Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Litopenaeus setiferus	2,189	7.8	7.6	11.06	8.31	1,057.54	1,563	20	0.05	10	36
Leiostomus xanthurus	2,039	7.3	57.6	10.30	1.62	221.62	158	132	0.80	48	266
Mugil cephalus	2,001	7.1	75.8	10.11	1.62	225.86	231	225	1.67	60	505
Micropogonias undulatus	1,531	5.4	30.3	7.73	1.94	353.36	224	160	0.55	76	267
Mugil curema	925	3.3	36.4	4.67	2.30	691.84	447	168	1.23	59	293
Brevoortia spp.	852	3.0	8.6	4.30	2.67	872.04	455	100	1.04	61	215
Sciaenops ocellatus	684	2.4	67.2	3.45	0.34	138.28	24	309	4.74	88	620
Pogonias cromis	434	1.5	32.3	2.19	0.94	603.31	178	232	4.48	87	820
Cynoscion nebulosus	307	1.1	39.9	1.55	0.29	266.63	34	225	5.40	40	568
Paralichthys albigutta	304	1.1	41.9	1.54	0.24	217.52	18	142	3.63	61	378
Elops saurus	168	0.6	24.2	0.85	0.16	271.24	16	271	3.79	122	391
Archosargus probatocephalus	97	0.3	24.2	0.49	0.08	239.62	7	312	6.98	23	428
Callinectes sapidus	84	0.3	17.7	0.42	0.09	301.53	10	118	5.41	15	194
Menticirrhus americanus	72	0.3	11.1	0.36	0.11	432.74	15	125	4.78	63	242
Paralichthys lethostigma	45	0.2	8.6	0.23	0.07	457.28	8	204	13.86	81	445
Farfantepenaeus spp.	40	0.1	8.1	0.20	0.08	541.69	13	11	0.35	5	14
Caranx hippos	30	0.1	6.1	0.15	0.05	454.58	5	113	7.94	42	179
Trachinotus falcatus	22	0.1	3.0	0.11	0.08	1,037.03	16	59	3.14	41	103
Trachinotus carolinus	21	0.1	3.0	0.11	0.07	908.17	13	97	4.10	82	160

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Cynoscion arenarius	12	<0.1	3.5	0.06	0.03	636.04	4	132	22.71	40	238
Farfantepenaeus duorarum	12	<0.1	3.0	0.06	0.03	717.71	5	18	0.75	15	23
Farfantepenaeus aztecus	10	<0.1	2.5	0.05	0.03	886.55	6	22	1.32	17	28
Mycteroperca microlepis	10	<0.1	3.0	0.05	0.02	654.03	3	172	8.22	106	208
Carcharhinus isodon	6	<0.1	1.5	0.03	0.02	873.99	3	376	5.59	352	391
Caranx crysos	5	<0.1	2.0	0.03	0.01	739.70	2	129	11.50	105	172
Menticirrhus littoralis	5	<0.1	1.0	0.03	0.02	1,158.96	4	136	5.50	129	158
Pomatomus saltatrix	5	<0.1	1.5	0.03	0.02	840.46	2	146	20.43	113	215
Sphyrna tiburo	5	<0.1	2.5	0.03	0.01	622.86	1	697	64.85	441	785
Lutjanus griseus	4	<0.1	1.0	0.02	0.02	1,110.73	3	123	34.14	32	197
Centropristis striata	3	<0.1	1.0	0.02	0.01	1,046.68	2	145	26.34	92	172
Sphyraena barracuda	3	<0.1	1.0	0.02	0.01	1,046.68	2	293	12.66	268	309
Lobotes surinamensis	2	<0.1	1.0	0.01	0.01	992.46	1	286	15.50	270	301
Menippe spp.	2	<0.1	1.0	0.01	0.01	992.46	1	77	23.00	54	100
Rachycentron canadum	2	<0.1	1.0	0.01	0.01	992.46	1	588	426.50	162	1,015
Calamus arctifrons	1	<0.1	0.5	0.01	0.01	1,407.12	1	80	.	80	80
Carcharhinus leucas	1	<0.1	0.5	0.01	0.01	1,407.12	1	655	.	655	655
Scomberomorus maculatus	1	<0.1	0.5	0.01	0.01	1,407.12	1	157	.	157	157
Totals	**11,934**	**42.5**	**.**	**60.27**	**10.44**	**243.81**	**1,589**	**.**	**.**	**5**	**1,015**

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.

6.1-m Bay Otter Trawls

A total of 8,429 animals were collected in 48 6.1-m bay otter trawls, representing 7% of the overall SRS catch (Table 4.7). Anchoa mitchilli (n=3,347), Litopenaeus setiferus (n=775), Orthopristis chrysoptera (n=538), and Etropus crossotus (n=451) were the most abundant taxa, accounting for 60.6% of the 6.1-m bay otter trawl catch (Table 4.12). The taxa most frequently caught in 6.1-m bay otter trawls were *Etropus crossotus* (75.0% occurrence), *Anchoa mitchilli* (52.1% occurrence), and *Micropogonias undulatus* (47.9% occurrence).

A total of 2,042 animals from 23 selected taxa were collected, representing 24.2% of the entire 6.1-m bay otter trawl catch (Table 4.13). Litopenaeus setiferus (n=775), Micropogonias undulatus (n=338), and Leiostomus xanthurus (n=299) were the most abundant selected taxa, accounting for 69.1% of the selected taxa collected by this gear. The selected taxa most frequently caught in 6.1-m bay otter trawls were *Farfantepenaeus duorarum* (56.2% occurrence), *Micropogonias undulatus* (47.9% occurrence), and *Farfantepenaeus* spp. (45.8% occurrence).

Table 4.12: Catch statistics for 10 dominant taxa collected in 48 6.1-m bay otter trawl samples during Apalachicola Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	3,347	39.7	52.1	4.58	1.44	218.14	40.72	46	0.26	13	90
Litopenaeus setiferus	775	9.2	25.0	1.10	0.71	447.43	31.10	21	0.17	11	32
Orthopristis chrysoptera	538	6.4	35.4	0.69	0.26	270.89	11.05	86	1.79	15	162
Etropus crossotus	451	5.4	75.0	0.63	0.12	126.93	2.90	75	0.80	32	122
Ariopsis felis	428	5.1	45.8	0.59	0.20	234.85	7.56	100	1.64	71	310
Lagodon rhomboides	368	4.4	37.5	0.49	0.19	269.72	7.26	86	0.78	27	123
Micropogonias undulatus	338	4.0	47.9	0.45	0.13	212.74	4.11	55	2.18	8	174
Leiostomus xanthurus	299	3.5	37.5	0.39	0.24	429.94	11.53	47	2.91	9	166
Bairdiella chrysoura	178	2.1	33.3	0.24	0.13	392.00	6.32	110	1.26	14	142
Cynoscion arenarius	170	2.0	33.3	0.23	0.08	247.16	3.07	62	2.86	10	224
Subtotals	6,892	81.8	.	.	.	.	.	.	.	8	310
Totals	**8,429**	**100.0**	**.**	**11.61**	**2.09**	**124.49**	**64.58**	**.**	**.**	**2**	**700**

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.

Table 4.13: Catch statistics for selected taxa collected in 48 6.1-m bay otter trawl samples during Apalachicola Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Litopenaeus setiferus	775	9.2	25.0	1.10	0.71	447.43	31.10	21	0.17	11	32
Micropogonias undulatus	338	4.0	47.9	0.45	0.13	212.74	4.11	55	2.18	8	174
Leiostomus xanthurus	299	3.5	37.5	0.39	0.24	429.94	11.53	47	2.91	9	166
Cynoscion arenarius	170	2.0	33.3	0.23	0.08	247.16	3.07	62	2.86	10	224
Farfantepenaeus duorarum	96	1.1	56.2	0.13	0.03	164.96	0.88	21	0.58	15	43
Farfantepenaeus spp.	74	0.9	45.8	0.10	0.03	229.61	1.28	11	0.28	5	14
Callinectes sapidus	72	0.9	33.3	0.10	0.04	258.71	1.35	79	5.95	18	190
Menticirrhus americanus	71	0.8	20.8	0.10	0.05	334.06	2.02	50	3.19	14	178
Paralichthys albigutta	45	0.5	37.5	0.06	0.02	229.07	0.71	112	8.23	47	312
Farfantepenaeus aztecus	33	0.4	22.9	0.05	0.02	287.99	0.84	22	1.03	15	32
Menippe spp.	16	0.2	18.8	0.02	0.01	268.21	0.34	23	5.68	3	80
Centropristis striata	15	0.2	10.4	0.02	0.01	377.18	0.45	79	6.36	51	130
Lutjanus synagris	13	0.2	12.5	0.02	0.01	362.03	0.39	30	3.02	16	58
Diplectrum formosum	6	0.1	6.2	0.01	0.01	425.97	0.21	65	13.68	26	121
Centropristis philadelphica	4	<0.1	6.2	0.01	<0.01	411.51	0.13	120	5.34	105	129
Cynoscion nebulosus	3	<0.1	4.2	<0.01	<0.01	511.98	0.13	78	67.50	10	145
Paralichthys lethostigma	3	<0.1	4.2	<0.01	<0.01	505.22	0.13	189	15.62	167	219
Calamus arctifrons	2	<0.1	2.1	<0.01	<0.01	692.82	0.13	82	1.50	81	84
Cynoscion nothus	2	<0.1	4.2	<0.01	<0.01	484.66	0.07	17	3.00	14	20

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lutjanus campechanus	2	<0.1	2.1	<0.01	<0.01	692.82	0.13	19	1.00	18	20
Argopecten irradians	1	<0.1	2.1	<0.01	<0.01	692.82	0.06	52	.	52	52
Mullus auratus	1	<0.1	2.1	<0.01	<0.01	692.82	0.06	46	.	46	46
Paralichthys squamilentus	1	<0.1	2.1	<0.01	<0.01	692.82	0.07	85	.	85	85
Totals	**2,042**	**24.2**	**.**	**2.83**	**0.78**	**190.92**	**32.73**	**.**	**.**	**3**	**312**

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.

River Sampling

21.3-m River Seines

A total of 6,644 animals were collected in 84 21.3-m river seines, representing 5.5% of the overall SRS catch (Table 4.7). Anchoa mitchilli (n=1,296) was the most abundant taxon collected, accounting for 19.5% of the 21.3-m river seine catch (Table 4.14). Alburnops petersoni (n=1,218) and Brevoortia spp. (n=643) were the next most abundant taxa, accounting for an additional 28% of the 21.3-m river seine catch. The taxa most frequently caught in 21.3-m river seines were *Callinectes sapidus* (57.1% occurrence), *Micropterus salmoides* (52.4% occurrence), and *Alburnops petersoni* (46.4% occurrence).

A total of 1,428 animals from 11 selected taxa were collected, representing 21.5% of the entire 21.3-m river seine catch (Table 4.15). Brevoortia spp. (n=643), and Callinectes sapidus (n=540) were the most abundant selected taxa, accounting for 82.8% of the selected taxa collected by this gear. The selected taxa most frequently caught in 21.3-m river seines were *Callinectes sapidus* (57.1% occurrence) and *Farfantepenaeus* spp. (17.9% occurrence).

Table 4.14: Catch statistics for 10 dominant taxa collected in 84 21.3-m river seine samples during Apalachicola Bay stratified-random sampling, 2023.

	Number			**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	1,296	19.5	42.9	22.69	8.19	330.75	454.41	26	0.19	14	56
Alburnops petersoni	1,218	18.3	46.4	21.32	5.41	232.59	286.76	33	0.18	18	55
Brevoortia spp.	643	9.7	15.5	11.26	6.62	538.65	479.41	23	0.06	19	26
Callinectes sapidus	540	8.1	57.1	9.45	3.28	318.17	242.65	17	0.55	5	104
Lucania parva	488	7.3	31.0	8.54	2.58	276.27	160.29	23	0.22	16	39
Micropterus salmoides	460	6.9	52.4	7.78	4.50	540.11	389.71	34	1.81	15	295
Menidia spp.	326	4.9	25.0	5.71	1.96	315.06	100.00	41	0.60	12	83
Trinectes maculatus	213	3.2	31.0	3.73	1.22	299.31	76.47	17	0.59	6	112
Notemigonus crysoleucas	206	3.1	27.4	3.61	1.48	375.14	108.82	37	0.75	16	115
Lepomis punctatus	139	2.1	36.9	2.43	0.51	193.05	23.53	47	2.35	20	151
Subtotals	5,529	83.1	.	.	.	.	.	.	.	5	295
Totals	**6,644**	**100.0**	**.**	**116.32**	**16.18**	**127.50**	**889.71**	**.**	**.**	**4**	**490**

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.

Table 4.15: Catch statistics for selected taxa collected in 84 21.3-m river seine samples during Apalachicola Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Brevoortia spp.	643	9.7	15.5	11.26	6.62	538.65	479.41	23	0.06	19	26
Callinectes sapidus	540	8.1	57.1	9.45	3.28	318.17	242.65	17	0.55	5	104
Leiostomus xanthurus	117	1.8	3.6	2.05	2.00	892.90	167.65	19	0.20	13	23
Farfantepenaeus spp.	70	1.1	17.9	1.23	0.59	442.71	47.06	7	0.28	4	14
Litopenaeus setiferus	28	0.4	10.7	0.49	0.21	398.79	13.24	9	0.76	4	20
Paralichthys lethostigma	9	0.1	7.1	0.16	0.07	383.81	2.94	89	30.01	32	295
Cynoscion nebulosus	8	0.1	4.8	0.14	0.08	505.51	4.41	38	8.24	19	81
Lutjanus griseus	8	0.1	4.8	0.14	0.07	449.90	2.94	36	5.20	18	58
Micropogonias undulatus	3	<0.1	3.6	0.05	0.03	522.74	1.47	15	1.53	13	18
Centropomus undecimalis	1	<0.1	1.2	0.02	0.02	916.52	1.47	48	.	48	48
Mugil cephalus	1	<0.1	1.2	0.02	0.02	916.52	1.47	298	.	298	298
Totals	**1,428**	**21.5**	**.**	**25.00**	**7.63**	**279.68**	**479.41**	**.**	**.**	**4**	**298**

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.

6.1-m River Otter Trawls

A total of 31,697 animals were collected in 24 6.1-m river otter trawls, representing 26.4% of the overall SRS catch (Table 4.7). Anchoa mitchilli (n=29,183) was the most abundant taxon collected, accounting for 92.1% of the 6.1-m river otter trawl catch (Table 4.16). The taxa most frequently caught in 6.1-m river otter trawls were *Micropogonias undulatus* (79.2% occurrence), *Anchoa mitchilli* (70.8% occurrence), and *Trinectes maculatus* (54.2% occurrence).

A total of 2,081 animals from 17 selected taxa were collected, representing 6.6% of the entire 6.1-m river otter trawl catch (Table 4.17). Cynoscion arenarius (n=803), Micropogonias undulatus (n=470), and Litopenaeus setiferus (n=347) were the most abundant selected taxa, accounting for 77.8% of the selected taxa collected by this gear. The selected taxa most frequently caught in the 6.1-m river otter trawls were *Micropogonias undulatus* (79.2% occurrence) and *Callinectes sapidus* (54.2% occurrence).

Table 4.16: Catch statistics for 10 dominant taxa collected in 24 6.1-m river otter trawl samples during Apalachicola Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	29,183	92.1	70.8	145.18	83.69	288.23	2,003.63	27	0.04	15	58
Cynoscion arenarius	803	2.5	45.8	4.48	2.89	315.62	63.28	31	0.45	11	85
Micropogonias undulatus	470	1.5	79.2	2.43	1.23	252.85	29.95	24	0.98	10	222
Litopenaeus setiferus	347	1.1	37.5	1.91	1.27	327.42	30.63	8	0.25	2	22
Brevoortia spp.	281	0.9	8.3	1.58	1.57	488.08	37.78	23	0.09	21	27
Trinectes maculatus	180	0.6	54.2	1.00	0.77	378.10	18.62	19	0.94	10	68
Callinectes sapidus	64	0.2	54.2	0.32	0.09	143.65	1.47	35	6.29	6	188
Eucinostomus spp.	58	0.2	33.3	0.31	0.13	206.84	2.21	25	1.24	12	39
Leiostomus xanthurus	44	0.1	29.2	0.24	0.12	251.69	2.70	56	6.71	17	180
Ictalurus punctatus	38	0.1	16.7	0.21	0.16	370.59	3.78	62	5.96	14	144
Subtotals	31,468	99.3	.	.	.	.	.	.	.	2	222
Totals	**31,697**	**100.0**	**.**	**165.05**	**87.71**	**260.35**	**2,011.85**	**.**	**.**	**2**	**348**

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.

Table 4.17: Catch statistics for selected taxa collected in 24 6.1-m river otter trawl samples during Apalachicola Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Cynoscion arenarius	803	2.5	45.8	4.48	2.89	315.62	63.28	31	0.45	11	85
Micropogonias undulatus	470	1.5	79.2	2.43	1.23	252.85	29.95	24	0.98	10	222
Litopenaeus setiferus	347	1.1	37.5	1.91	1.27	327.42	30.63	8	0.25	2	22
Brevoortia spp.	281	0.9	8.3	1.58	1.57	488.08	37.78	23	0.09	21	27
Callinectes sapidus	64	0.2	54.2	0.32	0.09	143.65	1.47	35	6.29	6	188
Leiostomus xanthurus	44	0.1	29.2	0.24	0.12	251.69	2.70	56	6.71	17	180
Farfantepenaeus spp.	31	0.1	33.3	0.17	0.09	253.69	2.02	9	0.51	4	14
Cynoscion nebulosus	11	<0.1	12.5	0.06	0.05	404.80	1.21	77	14.12	22	132
Farfantepenaeus aztecus	8	<0.1	20.8	0.04	0.02	227.04	0.37	17	0.98	15	23
Menticirrhus americanus	6	<0.1	8.3	0.03	0.03	407.39	0.61	34	5.06	13	49
Lutjanus griseus	4	<0.1	12.5	0.02	0.01	294.40	0.27	90	2.10	85	95
Sciaenops ocellatus	3	<0.1	8.3	0.02	0.01	358.74	0.25	44	7.36	36	59
Elops saurus	2	<0.1	8.3	0.01	0.01	338.80	0.13	37	3.00	34	40
Farfantepenaeus duorarum	2	<0.1	8.3	0.01	0.01	338.80	0.12	16	0.50	15	16
Paralichthys lethostigma	2	<0.1	4.2	0.01	0.01	489.90	0.25	68	5.00	63	73
Pogonias cromis	2	<0.1	4.2	0.01	0.01	489.90	0.25	282	15.50	267	298
Archosargus probatocephalus	1	<0.1	4.2	0.01	0.01	489.90	0.12	146	.	146	146
Totals	**2,081**	**6.6**	**.**	**11.46**	**4.96**	**211.88**	**98.62**	**.**	**.**	**2**	**298**

Species	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max

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.

4.4 Cedar Key

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

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling in the Cedar Key area since 1996. The area sampled was divided into two geographically-defined bay zones (B and C) and one riverine zone (F; Figure 4.4). Stratified-random sampling (SRS) was conducted in Zones B and C monthly using 21.3-m bay seines and 183-m haul seines and quarterly using 6.1-m bay otter trawls. Tidal creeks in Zone B were sampled using 21.3-m river seines. Monthly SRS was conducted in Zone F with 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2023 in the Cedar Key area.

Stratified-Random Sampling

A total of 73,257 animals, which included 137 taxa of fishes and 11 taxa of selected invertebrates, were collected from 652 Cedar Key SRS samples in 2023 (Table 4.18, Table A.10, Table A.11, Table A.12). *Anchoa mitchilli* (n=29,936) was the most numerous taxon collected, representing 40.9% of the total catch. *Lagodon rhomboides* (n=5,954) and *Leiostomus xanthurus* (n=4,558) were the next most abundant taxa collected, accounting for an additional 14.3% of the total catch. A total of 39 Selected Taxa (n=14,620 animals) composed 20% of the total catch. *Leiostomus xanthurus* (n=4,558) was the most abundant Selected Taxon, representing 6.2% of the total catch. *Brevoortia* spp. (n=2,429), *Mugil cephalus* (n=2,046), *Cynoscion arenarius* (n=1,082), and *Menticirrhus americanus* (n=722) were the next most abundant Selected Taxa, comprising 8.6% of the total catch. Collections in 2023 included 0 species new to the CK FIM collection.

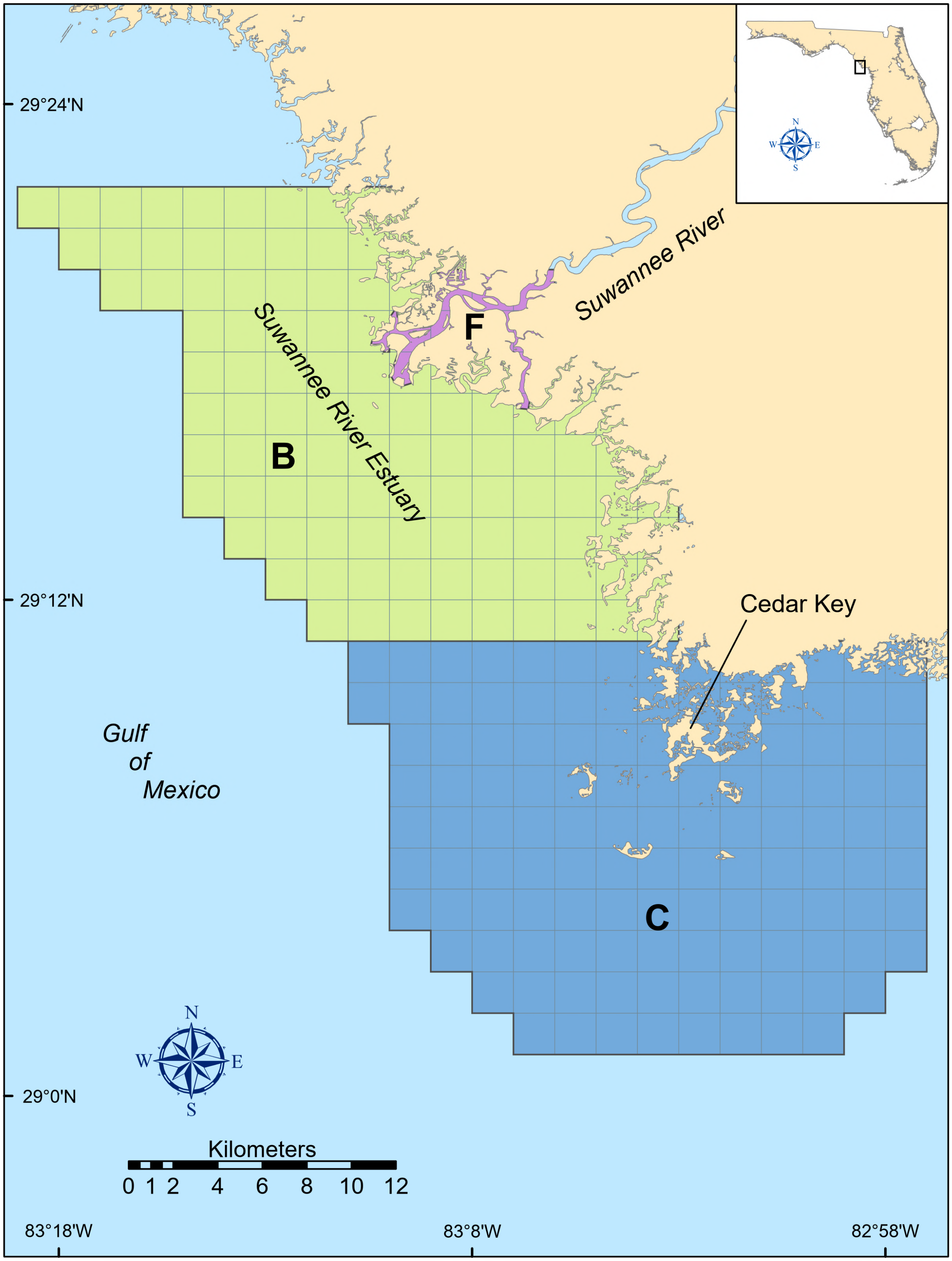

Figure 4.4: Map of Cedar Key sampling area. Zones are labeled B, C, and F.

Table 4.18: Summary of catch and effort data for Cedar Key stratified-random sampling, 2023.

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	12,177	120	17,710	108	5,218	96	5,077	20	40,182	344
C	14,071	132	.	.	8,504	96	1,846	20	24,421	248
F	.	.	8,654	60	.	.	.	.	8,654	60
Totals	**26,248**	**252**	**26,364**	**168**	**13,722**	**192**	**6,923**	**40**	**73,257**	**652**

Bay Sampling

21.3-m Bay Seines

A total of 26,248 animals were collected in 252 21.3-m bay seines, representing 35.8% of the overall SRS catch (Table 4.18). Anchoa mitchilli (n = 12,915) and Menidia spp. (n = 2,641) were the most abundant taxa, accounting for 59.3% of the bay seine catch (Table 4.19). The taxa most frequently caught in 21.3-m bay seines were *Lagodon rhomboides* (42.5% occurrence) and *Menidia* spp. (34.9% occurrence).

A total of 4,257 animals from 28 Selected Taxa were collected, representing 16.2% of the entire 21.3-m bay seine catch (Table 4.20). Leiostomus xanthurus (n=1,949) was the most abundant Selected Taxon, accounting for 45.8% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m bay seines were *Farfantepenaeus* spp. (23.0% occurrence) and *Callinectes sapidus* (22.6% occurrence).

Table 4.19: Catch statistics for 10 dominant taxa collected in 252 21.3-m bay seine samples during Cedar Key stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	12,915	49.2	33.7	36.32	11.14	488.67	2,294.29	37	0.08	15	74
Menidia spp.	2,641	10.1	34.9	7.49	2.16	458.87	392.14	62	0.27	15	99
Leiostomus xanthurus	1,949	7.4	17.5	5.52	2.37	680.89	512.14	30	0.32	11	136
Lagodon rhomboides	1,497	5.7	42.5	4.14	1.20	465.19	279.29	39	0.57	12	188
Harengula jaguana	1,303	5.0	8.3	3.68	2.22	959.55	472.14	33	0.27	19	80
Brevoortia spp.	743	2.8	6.0	2.11	0.99	744.60	150.71	30	0.19	21	50
Eucinostomus spp.	526	2.0	21.0	1.49	0.44	466.73	96.43	27	0.31	12	39
Menticirrhus americanus	498	1.9	20.2	1.41	0.37	414.97	47.14	43	0.93	16	270
Membras martinica	484	1.8	11.5	1.37	0.69	795.14	146.43	52	0.63	22	105
Ariopsis felis	413	1.6	11.1	1.17	0.79	1,075.47	198.57	104	3.39	46	303
Subtotals	22,969	87.5	.	.	.	.	.	.	.	11	303
Totals	**26,248**	**100.0**	**.**	**74.40**	**12.62**	**269.29**	**2,329.29**	**.**	**.**	**4**	**705**

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.

Table 4.20: Catch statistics for Selected Taxa collected in 252 21.3-m bay seine samples during Cedar Key stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Leiostomus xanthurus	1,949	7.4	17.5	5.52	2.37	680.89	512.14	30	0.32	11	136
Brevoortia spp.	743	2.8	6.0	2.11	0.99	744.60	150.71	30	0.19	21	50
Menticirrhus americanus	498	1.9	20.2	1.41	0.37	414.97	47.14	43	0.93	16	270
Cynoscion arenarius	220	0.8	11.1	0.62	0.21	536.39	38.57	34	0.70	14	71
Farfantepenaeus spp.	191	0.7	23.0	0.54	0.11	328.52	20.00	9	0.19	4	15
Callinectes sapidus	172	0.7	22.6	0.49	0.12	393.72	25.71	23	1.81	5	157
Sciaenops ocellatus	102	0.4	12.3	0.29	0.09	485.86	16.43	97	7.72	20	454
Mugil trichodon	81	0.3	2.8	0.23	0.15	1,062.04	33.57	25	0.95	12	53
Mugil cephalus	46	0.2	6.7	0.13	0.05	602.50	10.71	54	8.95	20	273
Paralichthys albigutta	45	0.2	9.5	0.13	0.03	355.17	3.57	58	8.98	14	335
Litopenaeus setiferus	39	0.1	4.0	0.11	0.06	844.71	10.71	14	0.44	6	19
Micropogonias undulatus	31	0.1	1.6	0.09	0.06	1,162.36	15.71	50	1.50	30	70
Menticirrhus saxatilis	25	0.1	7.9	0.07	0.02	424.52	3.57	35	3.10	16	71
Trachinotus falcatus	24	0.1	1.2	0.07	0.06	1,338.23	14.29	27	1.39	20	47
Cynoscion nebulosus	20	0.1	3.2	0.06	0.03	713.17	5.00	61	6.51	21	110
Pogonias cromis	16	0.1	1.6	0.05	0.03	958.62	5.71	218	23.95	100	370
Lutjanus griseus	9	<0.1	1.2	0.03	0.02	1,010.31	3.57	90	17.18	19	173
Mugil curema	9	<0.1	0.8	0.03	0.02	1,421.35	5.71	30	3.88	24	61
Farfantepenaeus duorarum	8	<0.1	2.4	0.02	0.01	681.43	1.43	18	1.05	15	22

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Pomatomus saltatrix	7	<0.1	0.4	0.02	0.02	1,587.45	5.00	53	4.60	45	73
Centropristis striata	6	<0.1	1.6	0.02	0.01	832.32	1.43	49	8.15	16	69
Lutjanus synagris	5	<0.1	1.6	0.01	0.01	835.69	1.43	36	2.84	28	44
Menippe spp.	4	<0.1	0.8	0.01	0.01	1,120.26	1.43	17	9.42	7	45
Haemulon plumierii	3	<0.1	0.8	0.01	0.01	1,181.33	1.43	34	1.45	32	37
Calamus arctifrons	1	<0.1	0.4	<0.01	<0.01	1,587.45	0.71	49	.	49	49
Centropomus undecimalis	1	<0.1	0.4	<0.01	<0.01	1,587.45	0.71	705	.	705	705
Diplectrum formosum	1	<0.1	0.4	<0.01	<0.01	1,587.45	0.71	68	.	68	68
Trachinotus carolinus	1	<0.1	0.4	<0.01	<0.01	1,587.45	0.71	20	.	20	20
Totals	**4,257**	**16.2**	**.**	**12.07**	**2.84**	**373.81**	**512.86**	**.**	**.**	**4**	**705**

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.

183-m Haul Seines

A total of 13,722 animals were collected in 192 183-m haul seines, representing 18.7% of the overall SRS catch (Table 4.18). Lagodon rhomboides (n = 2,820) was the most abundant taxon, accounting for 20.6% of the 183-m haul seine catch (Table 4.21. The taxa most frequently caught in 183-m haul seines were *Hypanus sabinus* (80.7% occurrence), *Mugil cephalus* (73.4% occurrence), and *Lagodon rhomboides* (63.5% occurrence).

A total of 5,035 animals from 33 Selected Taxa were collected, representing 36.7% of the entire 183-m haul seine catch (Table 4.22). Mugil cephalus (n=1,917) and Leiostomus xanthurus (n=647) were the most abundant Selected Taxa, accounting for 50.9% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 183-m haul seines were *Mugil cephalus* (73.4% occurrence) and *Sciaenops ocellatus* (51.6% occurrence).

Table 4.21: Catch statistics for 10 dominant taxa collected in 192 183-m haul seine samples during Cedar Key stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	2,820	20.6	63.5	14.03	2.04	206.51	190	90	0.35	32	206
Mugil cephalus	1,917	14.0	73.4	9.98	1.47	203.64	157	214	1.58	81	396
Hypanus sabinus	1,552	11.3	80.7	8.08	1.33	227.90	226	221	0.98	101	388
Bairdiella chrysoura	1,073	7.8	38.5	5.59	0.86	212.98	71	128	0.43	44	195
Ariopsis felis	894	6.5	54.7	4.66	0.75	223.67	72	237	1.31	74	352
Leiostomus xanthurus	647	4.7	41.7	3.37	0.61	250.03	57	120	1.16	53	200
Hypanus say	476	3.5	23.4	2.48	0.83	465.54	133	481	4.20	125	751
Ogcocephalus cubifrons	449	3.3	28.6	2.34	0.48	282.65	52	156	1.10	56	293
Sciaenops ocellatus	346	2.5	51.6	1.80	0.26	201.58	29	250	6.27	79	654
Pogonias cromis	341	2.5	39.1	1.78	0.29	224.24	28	290	10.07	84	875
Subtotals	10,515	76.7	.	.	.	.	.	.	.	32	875
Totals	**13,722**	**100.0**	**.**	**71.47**	**4.17**	**80.91**	**438**	**.**	**.**	**10**	**1,060**

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.

Table 4.22: Catch statistics for Selected Taxa collected in 192 183-m haul seine samples during Cedar Key stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil cephalus	1,917	14.0	73.4	9.98	1.47	203.64	157	214	1.58	81	396
Leiostomus xanthurus	647	4.7	41.7	3.37	0.61	250.03	57	120	1.16	53	200
Sciaenops ocellatus	346	2.5	51.6	1.80	0.26	201.58	29	250	6.27	79	654
Pogonias cromis	341	2.5	39.1	1.78	0.29	224.24	28	290	10.07	84	875
Centropomus undecimalis	283	2.1	32.8	1.47	0.37	352.15	58	650	5.15	247	862
Elops saurus	266	1.9	41.1	1.39	0.20	200.62	22	274	2.31	124	384
Brevoortia spp.	139	1.0	13.0	0.72	0.28	538.82	41	99	2.43	54	229
Callinectes sapidus	135	1.0	23.4	0.70	0.15	288.53	15	124	3.16	27	210
Mugil curema	130	0.9	16.1	0.68	0.24	487.38	40	141	2.34	104	251
Mugil trichodon	129	0.9	9.9	0.67	0.28	568.47	36	147	2.50	102	226
Micropogonias undulatus	124	0.9	8.3	0.65	0.30	652.51	43	151	3.64	57	378
Paralichthys albigutta	121	0.9	31.2	0.63	0.09	207.54	10	158	7.01	59	381
Cynoscion nebulosus	108	0.8	25.0	0.56	0.09	225.48	7	224	8.15	103	409
Archosargus probatocephalus	69	0.5	16.1	0.36	0.11	439.37	19	280	8.02	117	425
Trachinotus falcatus	67	0.5	7.8	0.35	0.17	678.15	26	106	4.10	39	220
Menticirrhus americanus	59	0.4	15.6	0.31	0.06	279.47	5	195	6.26	98	283
Litopenaeus setiferus	54	0.4	6.2	0.28	0.11	547.46	16	22	0.48	15	31
Lutjanus griseus	31	0.2	8.3	0.16	0.06	490.91	9	135	8.41	79	223
Farfantepenaeus duorarum	22	0.2	5.2	0.11	0.05	548.62	6	23	0.92	15	32

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Sphyrna tiburo	11	0.1	4.2	0.06	0.02	510.99	2	590	48.23	323	806
Caranx hippos	9	0.1	2.6	0.05	0.03	825.20	5	174	20.72	74	276
Lobotes surinamensis	7	0.1	1.6	0.04	0.03	1,026.38	5	359	23.14	266	458
Cynoscion arenarius	4	<0.1	2.1	0.02	0.01	687.36	1	124	25.47	66	182
Farfantepenaeus spp.	4	<0.1	1.6	0.02	0.01	844.82	2	11	1.00	10	14
Carcharhinus leucas	3	<0.1	1.0	0.02	0.01	1,030.63	2	574	24.36	534	618
Lutjanus synagris	2	<0.1	1.0	0.01	0.01	977.23	1	86	10.00	76	96
Argopecten irradians	1	<0.1	0.5	0.01	0.01	1,385.64	1	35	.	35	35
Carcharhinus limbatus	1	<0.1	0.5	0.01	0.01	1,385.64	1	401	.	401	401
Centropristis striata	1	<0.1	0.5	0.01	0.01	1,385.64	1	56	.	56	56
Menticirrhus saxatilis	1	<0.1	0.5	0.01	0.01	1,385.64	1	71	.	71	71
Rachycentron canadum	1	<0.1	0.5	0.01	0.01	1,385.64	1	918	.	918	918
Sphyraena barracuda	1	<0.1	0.5	0.01	0.01	1,385.64	1	281	.	281	281
Trachinotus carolinus	1	<0.1	0.5	0.01	0.01	1,385.64	1	176	.	176	176
Totals	**5,035**	**36.7**	**.**	**26.22**	**2.10**	**110.77**	**167**	**.**	**.**	**10**	**918**

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.

6.1-m Bay Otter Trawls

A total of 6,923 animals were collected in 40 6.1-m bay otter trawls, representing 9.5% of the overall SRS catch (Table 4.18). Anchoa mitchilli (n = 3,419), Cynoscion arenarius (n = 761), Orthopristis chrysoptera (n = 700), and Ariopsis felis (n = 395) were the most abundant taxa, accounting for 76.2% of the 6.1-m bay otter trawl catch (Table 4.23). The taxa most frequently caught in 6.1-m bay otter trawls were *Etropus crossotus* (82.5% occurrence), *Lagodon rhomboides* (47.5% occurrence), and *Orthopristis chrysoptera* (37.5% occurrence).

A total of 1,152 animals from 15 Selected Taxa were collected, representing 16.6% of the entire 6.1-m bay otter trawl catch (Table 4.24). Cynoscion arenarius (n=761), Menticirrhus americanus (n=155), and Farfantepenaeus spp. (n=119) were the most abundant Selected Taxa, accounting for 89.8% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 6.1-m bay otter trawls were *Farfantepenaeus duorarum* (25.0% occurrence), *Cynoscion arenarius* (22.5% occurrence), and *Paralichthys albigutta* (22.5% occurrence).

Table 4.23: Catch statistics for 10 dominant taxa collected in 40 6.1-m bay otter trawl samples during Cedar Key stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	3,419	49.4	15.0	6.15	3.61	371.34	115.05	36	0.17	21	71
Cynoscion arenarius	761	11.0	22.5	1.30	1.04	506.30	41.49	44	1.26	13	175
Orthopristis chrysoptera	700	10.1	37.5	1.15	0.98	543.48	40.14	86	0.67	21	162
Ariopsis felis	395	5.7	32.5	0.70	0.41	369.15	12.64	80	1.06	65	270
Etropus crossotus	277	4.0	82.5	0.48	0.08	108.29	1.96	88	1.13	25	137
Bairdiella chrysoura	236	3.4	22.5	0.38	0.20	326.30	6.87	118	0.89	18	139
Lagodon rhomboides	236	3.4	47.5	0.38	0.14	239.36	5.15	92	0.81	46	117
Menticirrhus americanus	155	2.2	20.0	0.27	0.12	270.27	2.70	58	2.96	19	163
Farfantepenaeus spp.	119	1.7	20.0	0.22	0.15	426.87	5.47	12	0.18	7	14
Hypanus sabinus	94	1.4	32.5	0.16	0.06	222.71	1.75	224	3.15	137	271
Subtotals	6,392	92.3	.	.	.	.	.	.	.	7	271
Totals	**6,923**	**100.0**	**.**	**12.14**	**4.60**	**239.77**	**131.47**	**.**	**.**	**7**	**932**

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.

Table 4.24: Catch statistics for Selected Taxa collected in 192 183-m haul seine samples during Cedar Key stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Cynoscion arenarius	761	11.0	22.5	1.30	1.04	506.30	41.49	44	1.26	13	175
Menticirrhus americanus	155	2.2	20.0	0.27	0.12	270.27	2.70	58	2.96	19	163
Farfantepenaeus spp.	119	1.7	20.0	0.22	0.15	426.87	5.47	12	0.18	7	14
Farfantepenaeus duorarum	30	0.4	25.0	0.05	0.03	326.05	1.05	18	0.59	15	26
Leiostomus xanthurus	24	0.3	12.5	0.04	0.03	471.32	1.21	89	4.23	66	140
Menippe spp.	11	0.2	12.5	0.02	0.01	364.76	0.40	30	3.64	18	52
Callinectes sapidus	10	0.1	5.0	0.02	0.01	441.44	0.34	129	8.10	92	163
Lutjanus synagris	9	0.1	7.5	0.02	0.01	356.08	0.21	104	1.57	96	112
Paralichthys albigutta	9	0.1	22.5	0.02	<0.01	188.41	0.08	178	16.27	91	268
Micropogonias undulatus	7	0.1	7.5	0.01	0.01	398.61	0.26	130	15.82	53	189
Centropristis striata	5	0.1	7.5	0.01	0.01	371.77	0.14	91	5.84	75	110
Cynoscion nebulosus	5	0.1	5.0	0.01	0.01	526.28	0.30	106	33.58	51	237
Diplectrum formosum	5	0.1	12.5	0.01	<0.01	268.10	0.07	119	9.35	91	146
Argopecten irradians	1	<0.1	2.5	<0.01	<0.01	632.46	0.06	73	.	73	73
Litopenaeus setiferus	1	<0.1	2.5	<0.01	<0.01	632.46	0.07	19	.	19	19
Totals	**1,152**	**16.6**	**.**	**1.99**	**1.22**	**386.79**	**46.82**	**.**	**.**	**7**	**268**

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.

River Sampling

Tidal Creeks

21.3-m River Seines

A total of 17,710 animals were collected in 108 21.3-m river seines in tidal creeks, representing 24.2% of the overall SRS catch (Table 4.18). Anchoa mitchilli (n = 9,704) was the most abundant taxon collected, accounting for 54.8% of the 21.3-m river seine catch in tidal creeks (Table 4.25). Leiostomus xanthurus (n=1,799) and Brevoortia spp. (n=1,547) were the next most abundant taxa, accounting for an additional 18.9% of the 21.3-m river seine catch in tidal creeks. The taxa most frequently caught in 21.3-m river seines in tidal creeks were *Menidia* spp. (77.8% occurrence), *Anchoa mitchilli* (63.9% occurrence), and *Lagodon rhomboides* (49.1% occurrence).

A total of 3,753 animals from 19 Selected Taxa were collected, representing 21.2% of the entire 21.3-m river seine catch in tidal creeks (Table 4.26). Leiostomus xanthurus (n=1,799), and Brevoortia spp. (n=1,547) were the most abundant Selected Taxa, accounting for 89.2% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m river seines in tidal creeks were *Leiostomus xanthurus* (36.1% occurrence) and *Callinectes sapidus* (25.0% occurrence).

Table 4.25: Catch statistics for 10 dominant taxa collected in 108 21.3-m creek seine samples during Cedar Key stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	9,704	54.8	63.9	129.73	39.02	315.46	3,655.88	30	0.08	17	66
Leiostomus xanthurus	1,799	10.2	36.1	24.50	9.93	421.43	997.06	24	0.23	9	93
Brevoortia spp.	1,547	8.7	16.7	21.06	12.43	613.30	1,285.29	24	0.12	17	60
Menidia spp.	1,406	7.9	77.8	19.14	3.10	168.34	194.12	53	0.31	26	92
Lagodon rhomboides	1,022	5.8	49.1	13.92	8.10	605.19	872.06	25	0.46	12	139
Eucinostomus spp.	821	4.6	41.7	11.18	2.94	273.27	238.24	29	0.24	11	39
Bairdiella chrysoura	270	1.5	19.4	3.68	1.22	344.72	98.53	30	0.93	12	124
Eucinostomus harengulus	145	0.8	30.6	1.97	0.50	262.23	33.82	52	0.87	40	85
Fundulus grandis	113	0.6	13.0	1.54	0.74	501.73	75.00	57	1.39	23	102
Callinectes sapidus	85	0.5	25.0	1.16	0.32	290.70	29.41	24	3.01	6	153
Subtotals	16,912	95.4	.	.	.	.	.	.	.	6	153
Totals	**17,710**	**100.0**	**.**	**241.15**	**45.31**	**195.25**	**4,032.35**	**.**	**.**	**4**	**355**

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.

Table 4.26: Catch statistics for Selected Taxa collected in 108 21.3-m creek seine samples during Cedar Key stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Leiostomus xanthurus	1,799	10.2	36.1	24.50	9.93	421.43	997.06	24	0.23	9	93
Brevoortia spp.	1,547	8.7	16.7	21.06	12.43	613.30	1,285.29	24	0.12	17	60
Callinectes sapidus	85	0.5	25.0	1.16	0.32	290.70	29.41	24	3.01	6	153
Mugil cephalus	82	0.5	15.7	1.12	0.45	421.48	38.24	54	6.40	18	302
Cynoscion arenarius	77	0.4	20.4	1.05	0.38	372.85	29.41	31	1.37	12	75
Litopenaeus setiferus	56	0.3	4.6	0.76	0.61	824.77	64.71	10	0.22	5	13
Farfantepenaeus spp.	42	0.2	19.4	0.57	0.15	276.45	8.82	7	0.30	4	12
Sciaenops ocellatus	20	0.1	15.7	0.27	0.07	257.32	4.41	96	18.99	20	355
Cynoscion nebulosus	12	0.1	8.3	0.16	0.06	375.91	4.41	86	8.34	33	153
Menticirrhus americanus	10	0.1	3.7	0.14	0.07	522.81	4.41	70	6.57	35	102
Paralichthys albigutta	6	<0.1	2.8	0.08	0.06	731.40	5.88	76	30.98	19	181
Pogonias cromis	5	<0.1	1.9	0.07	0.06	855.08	5.88	160	3.59	147	168
Lutjanus griseus	3	<0.1	2.8	0.04	0.02	594.37	1.47	86	35.00	37	154
Pomatomus saltatrix	3	<0.1	2.8	0.04	0.02	594.37	1.47	41	1.33	40	44
Mugil curema	2	<0.1	0.9	0.03	0.03	1,039.23	2.94	28	2.50	25	30
Archosargus probatocephalus	1	<0.1	0.9	0.01	0.01	1,039.23	1.47	45	.	45	45
Centropomus undecimalis	1	<0.1	0.9	0.01	0.01	1,039.23	1.47	277	.	277	277
Menticirrhus saxatilis	1	<0.1	0.9	0.01	0.01	1,039.23	1.47	30	.	30	30
Mugil trichodon	1	<0.1	0.9	0.01	0.01	1,039.23	1.47	115	.	115	115

Species	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Totals	**3,753**	**21.2**	**.**	**51.10**	**16.08**	**326.99**	**1,327.94**	**.**	**.**	**4**	**355**

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.

Lower Suwannee River

21.3-m River Seines

A total of 8,654 animals were collected in 60 21.3-m river seine samples conducted in the Lower Suwannee River (LSR), representing 11.8% of the overall SRS catch (Table 4.18). Anchoa mitchilli (n=3,898) was the most abundant taxon collected, accounting for 45% of the 21.3-m river seine catch in the LSR (Table 4.27). Gambusia holbrooki (n=907) and Bairdiella chrysoura (n=901) were the next most abundant taxa, accounting for an additional 20.9% of the 21.3-m river seine catch in the LSR. The taxa most frequently caught in 21.3-m river seines in the LSR were *Eucinostomus* spp. (63.3% occurrence), *Callinectes sapidus* (58.3% occurrence), and *Menidia* spp. (43.3% occurrence).

A total of 423 animals from 11 Selected Taxa were collected, representing 4.9% of the entire 21.3-m river seine catch in the LSR (Table 4.28). Callinectes sapidus (n=222), and Leiostomus xanthurus (n=139) were the most abundant Selected Taxa, accounting for 85.3% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m river seines in the LSR were *Callinectes sapidus* (58.3% occurrence) and *Leiostomus xanthurus* (20.0% occurrence).

Table 4.27: Catch statistics for 10 dominant taxa collected in 60 21.3-m river seine samples during Cedar Key stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	3,898	45.0	35.0	95.54	46.05	373.37	2,342.65	25	0.05	17	49
Gambusia holbrooki	907	10.5	28.3	22.23	17.36	605.01	1,039.71	28	0.23	15	47
Bairdiella chrysoura	901	10.4	10.0	22.08	18.14	636.27	1,083.82	63	0.47	15	84
Eucinostomus spp.	393	4.5	63.3	9.63	2.29	184.44	105.88	25	0.32	11	39
Lagodon rhomboides	379	4.4	38.3	9.29	2.98	248.82	130.88	27	0.59	13	71
Fundulus seminolis	355	4.1	26.7	8.70	3.85	342.90	179.41	45	0.66	20	79
Lucania parva	306	3.5	20.0	7.50	3.24	334.90	150.00	25	0.27	17	37
Menidia spp.	297	3.4	43.3	7.28	2.27	241.95	114.71	50	0.84	22	78
Callinectes sapidus	222	2.6	58.3	5.44	1.76	250.41	94.12	21	1.02	7	116
Leiostomus xanthurus	139	1.6	20.0	3.41	1.80	408.77	98.53	28	0.67	14	79
Subtotals	7,797	90.0	.	.	.	.	.	.	.	7	116
Totals	**8,654**	**100.0**	**.**	**212.11**	**56.31**	**205.64**	**2,376.47**	**.**	**.**	**6**	**565**

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.

Table 4.28: Catch statistics for Selected Taxa collected in 60 21.3-m river seine samples during Cedar Key stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Callinectes sapidus	222	2.6	58.3	5.44	1.76	250.41	94.12	21	1.02	7	116
Leiostomus xanthurus	139	1.6	20.0	3.41	1.80	408.77	98.53	28	0.67	14	79
Cynoscion arenarius	20	0.2	5.0	0.49	0.44	697.94	26.47	39	2.21	22	53
Sciaenops ocellatus	18	0.2	6.7	0.44	0.27	468.60	13.24	56	5.36	19	91
Litopenaeus setiferus	6	0.1	3.3	0.15	0.10	543.06	4.41	12	0.61	11	14
Farfantepenaeus spp.	4	<0.1	5.0	0.10	0.06	467.59	2.94	9	1.55	6	13
Paralichthys albigutta	4	<0.1	5.0	0.10	0.06	467.59	2.94	139	32.70	53	192
Paralichthys lethostigma	4	<0.1	5.0	0.10	0.06	467.59	2.94	154	76.11	40	365
Cynoscion nebulosus	3	<0.1	3.3	0.07	0.05	573.42	2.94	58	16.44	33	89
Lutjanus griseus	2	<0.1	3.3	0.05	0.03	543.06	1.47	30	8.50	22	39
Mugil cephalus	1	<0.1	1.7	0.02	0.02	774.60	1.47	132	.	132	132
Totals	**423**	**4.9**	**.**	**10.37**	**2.69**	**201.08**	**111.76**	**.**	**.**	**6**	**365**

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.

4.5 Tampa Bay

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

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in Tampa Bay since 1989. The area sampled was divided into five geographically-defined bay zones (A–E) and four riverine zones (K–N; Figure 4.5). The riverine zones were defined as the Alafia (K), Little Manatee (L), Manatee (M), and Braden (N) rivers. Stratified-random sampling (SRS) was conducted in Zones A–E monthly using 21.3-m bay seines and 183-m haul seines and quarterly using 6.1-m bay otter trawls. SRS was conducted in Zones K–N in all months except March, May, and July with 21.3-m river seines and bimonthly with 6.1-m river otter trawls. All methods were the same as those described in Chapter 2. This section summarizes data collected by the FIM program during 2023 in Tampa Bay.

Stratified-Random Sampling

A total of 450,020 animals, which included 148 taxa of fishes and 12 taxa of selected invertebrates, were collected from 1,116 Tampa Bay SRS samples in 2023 (Table 4.29, Table A.13, Table A.14, Table A.15). *Anchoa mitchilli* (n=262,212) was the most numerous taxon collected, representing 58.3% of the total catch. *Lagodon rhomboides* (n=41,832) and *Eucinostomus* spp. (n=40,269) were the next most abundant taxa collected, accounting for an additional 18.2% of the total catch. A total of 39 selected taxa (n=10,122 animals) composed 2.2% of the total catch. *Farfantepenaeus duorarum* (n=2,310) was the most abundant Selected Taxon, representing 0.5% of the total catch. *Elops saurus* (n=1,615), *Centropomus undecimalis* (n=1,141), *Cynoscion nebulosus* (n=789), and *Mugil trichodon* (n=640) were the next most abundant selected taxa, comprising 0.9% of the total catch. Collections in 2023 included 3 species new to the TB FIM collection: *Atherina harringtonensis, Diodon holocanthus, Oreochromis niloticus*.

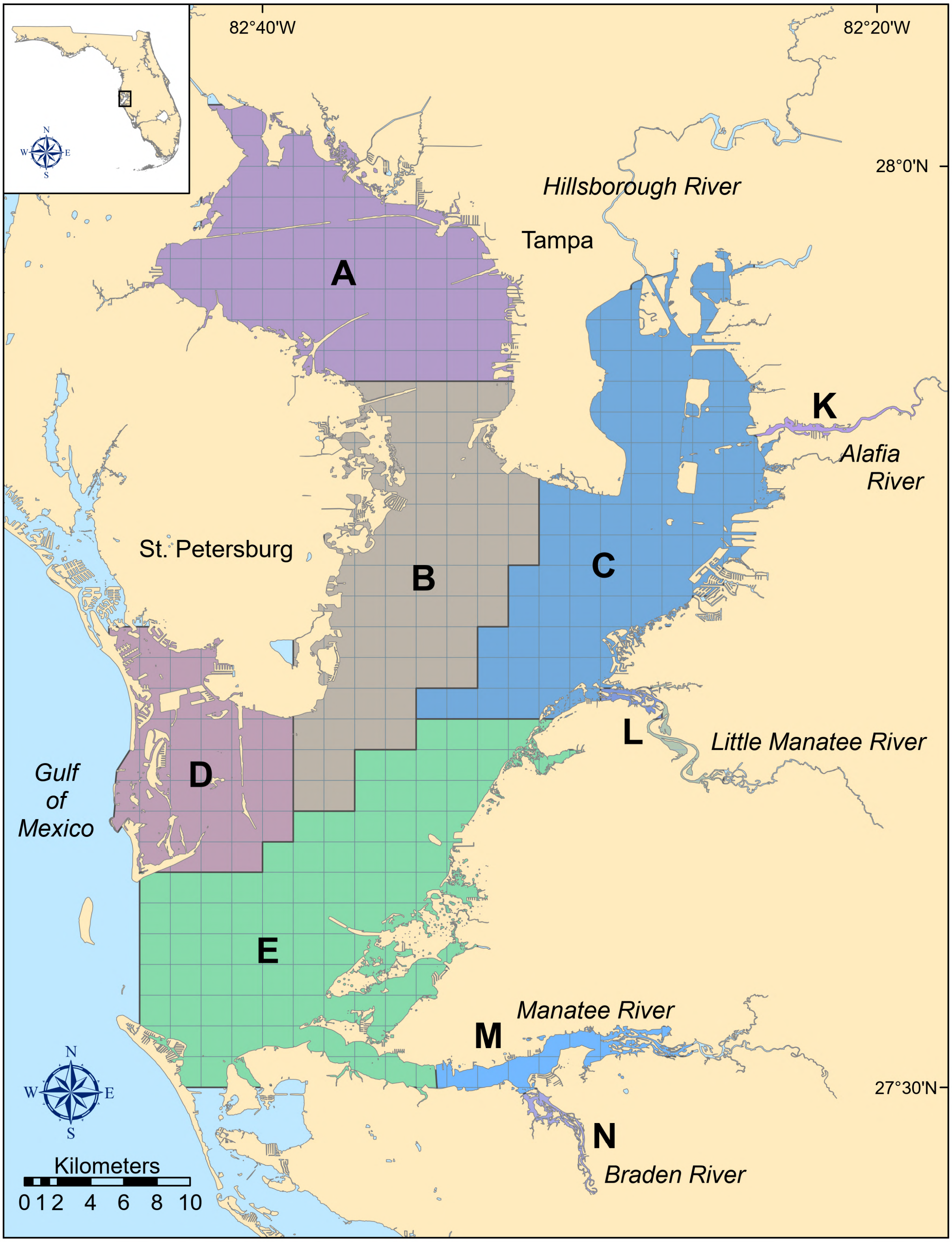

Figure 4.5: Map of Tampa Bay sampling area. Zones are labeled A-E (bay zones) and K-N (river zones).

Table 4.29: Summary of catch and effort data for Tampa Bay stratified-random sampling, 2023.

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	36,594	84	.	.	3,417	48	487	12	40,498	144
B	9,382	72	.	.	6,167	48	664	12	16,213	132
C	63,475	108	.	.	7,293	48	774	16	71,542	172
D	22,100	60	.	.	15,895	36	1,149	8	39,144	104
E	17,894	84	.	.	16,897	60	671	12	35,462	156
K	.	.	58,607	117	.	.	2,964	12	61,571	129
L	.	.	86,676	81	.	.	2,494	36	89,170	117
M	.	.	61,190	72	.	.	772	24	61,962	96
N	.	.	32,728	54	.	.	1,730	12	34,458	66
Totals	**149,445**	**408**	**239,201**	**324**	**49,669**	**240**	**11,705**	**144**	**450,020**	**1,116**

Bay Sampling

21.3-m Bay Seines

A total of 149,445 animals were collected in 408 21.3-m bay seines, representing 33.2% of the overall SRS catch (Table 4.29). Anchoa mitchilli (n=74,295) and Eucinostomus spp. (n=21,516) were the most abundant taxa, accounting for 64.1% of the bay seine catch (Table 4.30). The taxa most frequently caught in 21.3-m bay seines were *Eucinostomus* spp. (61.0% occurrence) and *Eucinostomus gula* (50.2% occurrence).

A total of 2,710 animals from 25 selected taxa were collected, representing 1.8% of the entire 21.3-m bay seine catch (Table 4.31). Farfantepenaeus duorarum (n=1,499) was the most abundant Selected Taxon, accounting for 55.3% of the selected taxa collected by this gear. The selected taxa most frequently caught in 21.3-m bay seines were *Farfantepenaeus duorarum* (30.4% occurrence) and *Cynoscion nebulosus* (20.8% occurrence).

Table 4.30: Catch statistics for 10 dominant taxa collected in 408 21.3-m bay seine samples during Tampa Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	74,295	49.7	12.5	128.81	54.68	861.67	20,022.86	30	0.02	13	57
Eucinostomus spp.	21,516	14.4	61.0	37.48	4.28	231.01	672.14	27	0.04	8	39
Lagodon rhomboides	10,091	6.8	37.3	17.29	3.62	427.96	1,153.57	37	0.16	11	164
Lucania parva	8,717	5.8	27.5	15.26	4.39	580.86	1,488.57	24	0.04	15	41
Eucinostomus gula	6,722	4.5	50.2	11.74	1.58	272.68	422.86	57	0.14	40	104
Menidia spp.	4,953	3.3	19.6	8.65	1.69	396.22	322.86	43	0.17	12	93
Floridichthys carpio	4,577	3.1	17.9	8.01	3.88	977.80	1,528.57	31	0.14	9	55
Microgobius gulosus	3,237	2.2	40.7	5.65	1.18	421.48	328.57	30	0.12	14	57
Harengula jaguana	3,107	2.1	7.1	5.43	2.82	1,050.39	970.00	48	0.18	18	100
Eucinostomus harengulus	2,033	1.4	30.4	3.56	0.60	341.62	143.57	59	0.30	40	110
Subtotals	139,248	93.3	.	.	.	.	.	.	.	8	164
Totals	**149,444**	**100.0**	**.**	**261.63**	**58.68**	**453.05**	**20,692.14**	**.**	**.**	**3**	**743**

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.

Table 4.31: Catch statistics for selected taxa collected in 408 21.3-m bay seine samples during Tampa Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Farfantepenaeus duorarum	1,499	1.0	30.4	2.62	0.59	457.54	160.71	9	0.09	3	26
Cynoscion nebulosus	472	0.3	20.8	0.83	0.14	341.70	27.14	37	0.83	14	136
Menticirrhus americanus	195	0.1	2.5	0.34	0.20	1,158.78	57.14	28	0.40	9	55
Mugil trichodon	138	0.1	3.7	0.24	0.13	1,111.01	51.43	40	2.23	17	142
Mugil cephalus	84	0.1	1.0	0.15	0.14	1,877.42	55.71	22	0.18	19	25
Sciaenops ocellatus	73	<0.1	3.7	0.13	0.07	1,140.22	28.57	61	13.73	12	596
Leiostomus xanthurus	60	<0.1	1.2	0.11	0.09	1,789.67	37.86	24	1.82	15	85
Callinectes sapidus	54	<0.1	7.1	0.09	0.02	506.43	5.00	47	4.55	7	142
Archosargus probatocephalus	35	<0.1	4.9	0.06	0.02	560.21	3.57	64	12.85	12	304
Trachinotus falcatus	25	<0.1	2.0	0.04	0.02	927.54	5.71	45	5.71	12	121
Menticirrhus saxatilis	17	<0.1	2.5	0.03	0.01	736.15	2.86	29	3.00	12	54
Paralichthys albigutta	15	<0.1	2.9	0.03	0.01	609.68	1.43	60	9.29	13	134
Cynoscion arenarius	9	<0.1	0.5	0.02	0.01	1,435.35	3.57	25	1.66	17	32
Lutjanus griseus	9	<0.1	2.0	0.02	0.01	738.52	1.43	134	26.84	40	229
Calamus spp.	4	<0.1	0.7	0.01	<0.01	1,234.40	1.43	18	3.15	13	27
Centropomus undecimalis	4	<0.1	1.0	0.01	<0.01	1,006.22	0.71	216	57.40	56	322
Calamus penna	3	<0.1	0.5	0.01	<0.01	1,504.06	1.43	41	5.61	33	52
Mugil curema	3	<0.1	0.7	0.01	<0.01	1,163.32	0.71	53	14.29	25	72
Elops saurus	2	<0.1	0.5	<0.01	<0.01	1,426.53	0.71	125	90.00	35	215

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Haemulon plumierii	2	<0.1	0.5	<0.01	<0.01	1,426.53	0.71	23	0.00	23	23
Mycteroperca microlepis	2	<0.1	0.5	<0.01	<0.01	1,426.53	0.71	132	43.50	88	175
Sphyraena barracuda	2	<0.1	0.5	<0.01	<0.01	1,426.53	0.71	58	2.50	55	60
Argopecten irradians	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	11	.	11	11
Pogonias cromis	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	184	.	184	184
Sphyrna tiburo	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	543	.	543	543
Totals	**2,710**	**1.8**	**.**	**4.74**	**0.74**	**314.38**	**165.00**	**.**	**.**	**3**	**596**

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.

183-m Haul Seines

A total of 49,669 animals were collected in 240 183-m haul seines, representing 11% of the overall SRS catch (Table 4.29). Lagodon rhomboides (n=29,842) was the most abundant taxon, accounting for 60.1% of the 183-m haul seine catch (Table 4.32). The taxa most frequently caught in 183-m haul seines were *Lagodon rhomboides* (61.3% occurrence), *Eucinostomus gula* (61.3% occurrence), and *Eucinostomus harengulus* (39.2% occurrence).

A total of 5,014 animals from 33 selected taxa were collected, representing 10.1% of the entire 183-m haul seine catch (Table 4.33). Elops saurus (n=1,579) and Centropomus undecimalis (n=1,029) were the most abundant selected taxa, accounting for 52% of the selected taxa collected by this gear. The selected taxa most frequently caught in 183-m haul seines were *Centropomus undecimalis* (38.8% occurrence) and *Archosargus probatocephalus* (38.3% occurrence).

Table 4.32: Catch statistics for 10 dominant taxa collected in 240 183-m haul seine samples during Tampa Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	29,842	60.1	61.3	121.31	19.93	257.62	3,468	99	0.14	56	205
Eucinostomus gula	7,793	15.7	61.3	32.47	5.04	240.52	587	83	0.14	40	190
Eucinostomus harengulus	1,750	3.5	39.2	7.29	1.89	400.68	349	94	0.23	42	131
Elops saurus	1,579	3.2	18.3	6.58	3.56	837.48	641	287	1.37	173	468
Ariopsis felis	1,279	2.6	35.0	5.33	1.09	317.44	204	277	1.01	106	399
Centropomus undecimalis	1,029	2.1	38.8	4.29	0.88	317.01	154	443	3.05	140	832
Opisthonema oglinum	837	1.7	11.7	3.49	2.25	998.73	525	133	0.73	91	165
Harengula jaguana	537	1.1	14.2	2.24	0.93	642.45	175	109	0.62	41	145
Archosargus probatocephalus	470	0.9	38.3	1.85	0.35	302.30	72	185	3.92	44	452
Orthopristis chrysoptera	364	0.7	14.6	1.52	0.50	515.40	98	100	1.46	43	239
Subtotals	45,480	91.6	.	.	.	.	.	.	.	40	832
Totals	**49,665**	**100.0**	**.**	**206.95**	**22.21**	**166.26**	**3,515**	**.**	**.**	**8**	**911**

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.

Table 4.33: Catch statistics for selected taxa collected in 240 183-m haul seine samples during Tampa Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Elops saurus	1,579	3.2	18.3	6.58	3.56	837.48	641	287	1.37	173	468
Centropomus undecimalis	1,029	2.1	38.8	4.29	0.88	317.01	154	443	3.05	140	832
Archosargus probatocephalus	470	0.9	38.3	1.85	0.35	302.30	72	185	3.92	44	452
Mugil trichodon	347	0.7	20.8	1.45	0.32	345.95	41	180	1.92	94	300
Mugil cephalus	255	0.5	26.2	1.06	0.22	322.26	36	295	5.44	102	529
Cynoscion nebulosus	199	0.4	15.4	0.83	0.27	510.37	46	194	4.74	78	432
Leiostomus xanthurus	186	0.4	7.1	0.78	0.32	643.04	65	134	2.49	79	210
Callinectes sapidus	167	0.3	26.2	0.70	0.16	352.86	32	98	2.78	40	188
Sciaenops ocellatus	124	0.2	25.0	0.52	0.08	244.67	10	382	11.73	92	723
Mugil curema	108	0.2	14.6	0.45	0.11	386.61	15	210	3.87	105	330
Brevoortia spp.	98	0.2	2.1	0.41	0.33	1,263.72	79	220	3.08	84	261
Farfantepenaeus duorarum	68	0.1	12.1	0.28	0.06	342.25	6	20	0.63	8	28
Lutjanus griseus	61	0.1	7.5	0.25	0.09	572.19	15	178	4.27	94	275
Haemulon plumierii	57	0.1	4.6	0.24	0.11	735.60	24	87	2.92	53	168
Paralichthys albigutta	49	0.1	12.9	0.20	0.04	327.72	6	181	14.47	47	421
Mycteroperca microlepis	39	0.1	4.2	0.16	0.07	637.72	10	177	3.69	116	224
Sphyrna tiburo	37	0.1	10.8	0.15	0.04	368.88	5	565	11.15	413	702
Trachinotus falcatus	25	0.1	2.9	0.10	0.06	921.88	14	194	10.78	89	313
Menticirrhus littoralis	22	<0.1	1.2	0.09	0.06	1,056.08	12	222	6.60	178	293

Species	Number		% Occur	Density Estimate (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Lutjanus synagris	21	<0.1	1.2	0.09	0.07	1,274.35	17	95	2.33	76	117
Caranx hippos	14	<0.1	3.3	0.06	0.02	638.77	4	215	14.82	117	348
Calamus penna	13	<0.1	2.5	0.05	0.02	657.30	3	104	8.12	70	158
Sphyraena barracuda	12	<0.1	2.5	0.05	0.02	701.46	3	260	19.32	115	352
Pogonias cromis	11	<0.1	2.9	0.05	0.02	669.38	3	234	24.86	156	377
Trachinotus carolinus	6	<0.1	1.2	0.03	0.02	1,093.15	4	333	15.12	268	374
Haemulon aurolineatum	5	<0.1	0.4	0.02	0.02	1,549.19	5	89	4.94	80	107
Menticirrhus americanus	3	<0.1	1.2	0.01	0.01	890.68	1	250	5.78	240	260
Lobotes surinamensis	2	<0.1	0.4	0.01	0.01	1,549.19	2	386	9.50	376	395
Menippe spp.	2	<0.1	0.8	0.01	0.01	1,093.15	1	58	32.00	26	90
Menticirrhus saxatilis	2	<0.1	0.8	0.01	0.01	1,093.15	1	158	48.50	109	206
Epinephelus morio	1	<0.1	0.4	<0.01	<0.01	1,549.19	1	113	.	113	113
Pomatomus saltatrix	1	<0.1	0.4	<0.01	<0.01	1,549.19	1	149	.	149	149
Rachycentron canadum	1	<0.1	0.4	<0.01	<0.01	1,549.19	1	301	.	301	301
Totals	**5,014**	**10.1**	**.**	**20.89**	**4.04**	**299.60**	**717**	**.**	**.**	**8**	**832**

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.

6.1-m Bay Otter Trawls

A total of 3,745 animals were collected in 60 6.1-m bay otter trawls, representing 0.8% of the overall SRS catch (Table 4.29). Lagodon rhomboides (n=810), Portunus spp. (n=616), Eucinostomus gula (n=371), and Prionotus scitulus (n=338) were the most abundant taxa, accounting for 57% of the 6.1-m bay otter trawl catch (Table 4.34). The taxa most frequently caught in 6.1-m bay otter trawls were *Prionotus scitulus* (66.7% occurrence), *Lagodon rhomboides* (38.3% occurrence), and *Portunus* spp. (38.3% occurrence).

A total of 626 animals from 16 selected taxa were collected, representing 16.7% of the entire 6.1-m bay otter trawl catch (Table 4.35). Cynoscion arenarius (n=190), Lutjanus synagris (n=137), and Farfantepenaeus duorarum (n=127) were the most abundant selected taxa, accounting for 72.5% of the selected taxa collected by this gear. The selected taxa most frequently caught in 6.1-m bay otter trawls were *Farfantepenaeus duorarum* (38.3% occurrence), *Menippe* spp. (21.7% occurrence), and *Callinectes sapidus* (20.0% occurrence).

Table 4.34: Catch statistics for 10 dominant taxa collected in 60 6.1-m bay otter trawl samples during Tampa Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	810	21.6	38.3	0.92	0.37	309.11	16.97	80	1.00	18	155
Portunus spp.	616	16.4	38.3	0.72	0.36	382.05	20.17	49	0.39	10	82
Eucinostomus gula	371	9.9	36.7	0.44	0.13	238.44	5.55	77	0.71	40	102
Prionotus scitulus	338	9.0	66.7	0.40	0.08	159.10	3.00	91	1.63	30	170
Cynoscion arenarius	190	5.1	8.3	0.22	0.18	639.78	11.17	26	2.01	9	189
Lutjanus synagris	137	3.7	13.3	0.16	0.14	656.10	8.24	106	1.75	19	137
Farfantepenaeus duorarum	127	3.4	38.3	0.15	0.04	215.88	1.95	18	0.66	3	37
Eucinostomus spp.	98	2.6	16.7	0.11	0.06	387.63	2.97	28	0.60	14	39
Orthopristis chrysoptera	91	2.4	15.0	0.11	0.05	362.83	2.56	90	3.28	26	159
Symphurus plagiusa	80	2.1	25.0	0.09	0.04	366.49	2.50	111	2.90	23	137
Subtotals	2,858	76.2	.	.	.	.	.	.	.	3	189
Totals	**3,744**	**100.0**	**.**	**4.39**	**0.74**	**130.60**	**28.76**	**.**	**.**	**3**	**539**

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.

Table 4.35: Catch statistics for selected taxa collected in 60 6.1-m bay otter trawl samples during Tampa Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Cynoscion arenarius	190	5.1	8.3	0.22	0.18	639.78	11.17	26	2.01	9	189
Lutjanus synagris	137	3.7	13.3	0.16	0.14	656.10	8.24	106	1.75	19	137
Farfantepenaeus duorarum	127	3.4	38.3	0.15	0.04	215.88	1.95	18	0.66	3	37
Callinectes sapidus	45	1.2	20.0	0.05	0.03	470.18	1.95	94	4.58	34	152
Menticirrhus americanus	37	1.0	16.7	0.04	0.02	292.59	0.75	119	9.78	23	199
Haemulon plumierii	28	0.7	6.7	0.03	0.02	483.49	1.01	84	5.70	25	155
Menippe spp.	24	0.6	21.7	0.03	0.01	215.83	0.27	26	4.33	5	87
Paralichthys albigutta	14	0.4	16.7	0.02	0.01	241.75	0.14	189	13.24	120	273
Mycteroperca microlepis	6	0.2	1.7	0.01	0.01	774.60	0.43	139	4.25	128	154
Cynoscion nebulosus	5	0.1	6.7	0.01	<0.01	398.51	0.13	52	31.58	13	178
Diplectrum formosum	5	0.1	6.7	0.01	<0.01	399.65	0.13	95	17.36	48	151
Argopecten irradians	4	0.1	1.7	<0.01	<0.01	774.60	0.30	22	3.84	10	26
Archosargus probatocephalus	1	<0.1	1.7	<0.01	<0.01	774.60	0.07	16	.	16	16
Argopecten gibbus	1	<0.1	1.7	<0.01	<0.01	774.60	0.07	35	.	35	35
Leiostomus xanthurus	1	<0.1	1.7	<0.01	<0.01	774.60	0.07	140	.	140	140
Menticirrhus saxatilis	1	<0.1	1.7	<0.01	<0.01	774.60	0.07	214	.	214	214
Totals	**626**	**16.7**	**.**	**0.75**	**0.27**	**277.18**	**13.49**	**.**	**.**	**3**	**273**

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.

River Sampling

21.3-m River Seines

A total of 239,201 animals were collected in 324 21.3-m river seines, representing 53.2% of the overall SRS catch (Table 4.29). Anchoa mitchilli (n=183,437) was the most abundant taxon collected, accounting for 76.7% of the 21.3-m river seine catch (Table 4.36). Eucinostomus spp. (n=17,678) and Menidia spp. (n=17,128) were the next most abundant taxa, accounting for an additional 14.6% of the 21.3-m river seine catch. The taxa most frequently caught in 21.3-m river seines were *Eucinostomus* spp. (83.6% occurrence), *Menidia* spp. (79.9% occurrence), and *Eucinostomus harengulus* (73.5% occurrence).

A total of 1,165 animals from 18 selected taxa were collected, representing 0.5% of the entire 21.3-m river seine catch (Table 4.37). Farfantepenaeus duorarum (n=307), and Sciaenops ocellatus (n=216) were the most abundant selected taxa, accounting for 44.9% of the selected taxa collected by this gear. The selected taxa most frequently caught in 21.3-m river seines were *Farfantepenaeus duorarum* (33.6% occurrence) and *Centropomus undecimalis* (16.4% occurrence).

Table 4.36: Catch statistics for 10 dominant taxa collected in 324 21.3-m river seine samples during Tampa Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	183,437	76.7	50.3	817.46	252.20	560.46	64,752.94	31	0.01	15	62
Eucinostomus spp.	17,678	7.4	83.6	79.75	8.19	185.36	1,063.24	29	0.05	11	40
Menidia spp.	17,128	7.2	79.9	77.03	7.50	176.14	1,067.65	38	0.08	12	82
Eucinostomus harengulus	5,028	2.1	73.5	22.68	2.16	171.90	320.59	56	0.16	40	129
Eucinostomus gula	2,487	1.0	41.4	11.18	2.37	383.44	623.53	56	0.22	40	121
Bairdiella chrysoura	2,344	1.0	4.3	10.64	8.52	1,441.13	2,727.94	64	0.38	9	95
Lucania parva	2,178	0.9	27.8	9.89	3.88	706.49	1,179.41	25	0.10	8	43
Microgobius gulosus	1,403	0.6	58.0	6.37	0.92	259.18	200.00	28	0.19	10	58
Eugerres plumieri	1,365	0.6	38.9	6.14	1.28	377.06	320.59	47	0.91	10	224
Lagodon rhomboides	922	0.4	34.3	4.18	0.70	301.65	116.18	44	0.63	13	111
Subtotals	233,970	97.9	.	.	.	.	.	.	.	8	224
Totals	**239,197**	**100.0**	**.**	**1,085.70**	**258.09**	**427.89**	**64,989.71**	**.**	**.**	**3**	**625**

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.

Table 4.37: Catch statistics for selected taxa collected in 324 21.3-m river seine samples during Tampa Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Farfantepenaeus duorarum	307	0.1	33.6	1.39	0.20	261.50	51.47	8	0.18	3	21
Sciaenops ocellatus	216	0.1	15.1	0.98	0.26	483.70	52.94	54	2.90	18	521
Mugil trichodon	155	0.1	2.8	0.70	0.50	1,273.72	152.94	32	1.94	15	185
Centropomus undecimalis	108	<0.1	16.4	0.48	0.08	311.83	11.76	159	13.21	24	625
Cynoscion nebulosus	92	<0.1	9.0	0.42	0.14	594.32	38.24	53	2.53	11	97
Callinectes sapidus	73	<0.1	11.4	0.33	0.07	373.35	8.82	41	4.91	9	156
Archosargus probatocephalus	48	<0.1	9.0	0.22	0.06	521.62	17.65	99	8.97	16	258
Leiostomus xanthurus	41	<0.1	4.0	0.19	0.08	743.36	20.59	53	3.63	17	90
Mugil cephalus	40	<0.1	2.8	0.18	0.09	927.01	25.00	54	8.42	21	360
Elops saurus	33	<0.1	3.4	0.15	0.06	685.90	10.29	66	5.10	35	185
Cynoscion arenarius	28	<0.1	3.4	0.13	0.06	792.70	13.24	38	1.89	18	63
Brevoortia spp.	8	<0.1	2.2	0.04	0.01	705.54	2.94	35	6.23	19	70
Lutjanus griseus	6	<0.1	1.5	0.03	0.01	843.92	2.94	144	22.53	50	186
Menticirrhus americanus	3	<0.1	0.9	0.01	0.01	1,036.01	1.47	57	17.33	28	88
Mugil curema	3	<0.1	0.9	0.01	0.01	1,036.01	1.47	100	56.64	28	212
Paralichthys albigutta	2	<0.1	0.6	0.01	0.01	1,270.82	1.47	144	75.50	69	220
Carcharhinus leucas	1	<0.1	0.3	<0.01	<0.01	1,800.00	1.47	522	.	522	522
Menticirrhus saxatilis	1	<0.1	0.3	<0.01	<0.01	1,800.00	1.47	53	.	53	53
Totals	**1,165**	**0.5**	**.**	**5.29**	**0.68**	**230.54**	**163.24**	**.**	**.**	**3**	**625**

Species	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max

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.

6.1-m River Otter Trawls

A total of 7,960 animals were collected in 84 6.1-m river otter trawls, representing 1.8% of the overall SRS catch (Table 4.29). Anchoa mitchilli (n=4,405) was the most abundant taxon collected, accounting for 55.3% of the 6.1-m river otter trawl catch (Table 4.38). The taxa most frequently caught in 6.1-m river otter trawls were *Farfantepenaeus duorarum* (65.5% occurrence), *Callinectes sapidus* (64.3% occurrence), and *Microgobius gulosus* (46.4% occurrence).

A total of 607 animals from 14 selected taxa were collected, representing 7.6% of the entire 6.1-m river otter trawl catch (Table 4.39). Farfantepenaeus duorarum (n=309), Callinectes sapidus (n=168), and Menticirrhus americanus (n=54) were the most abundant selected taxa, accounting for 87.5% of the selected taxa collected by this gear. The selected taxa most frequently caught in the 6.1-m river otter trawls were *Farfantepenaeus duorarum* (65.5% occurrence) and *Callinectes sapidus* (64.3% occurrence).

Table 4.38: Catch statistics for 10 dominant taxa collected in 84 6.1-m river otter trawl samples during Tampa Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	4,405	55.3	26.2	8.28	4.36	482.25	333.75	29	0.09	15	63
Eucinostomus spp.	968	12.2	44.0	1.69	0.58	313.00	33.90	26	0.23	8	39
Eucinostomus gula	423	5.3	32.1	0.72	0.26	327.57	15.38	71	0.56	40	104
Microgobius gulosus	406	5.1	46.4	0.68	0.20	267.09	12.68	24	0.39	9	54
Farfantepenaeus duorarum	309	3.9	65.5	0.54	0.10	173.57	4.99	11	0.30	2	33
Eucinostomus harengulus	226	2.8	41.7	0.38	0.10	244.15	6.75	57	0.74	40	105
Trinectes maculatus	213	2.7	41.7	0.36	0.11	268.08	7.05	44	1.08	10	96
Lagodon rhomboides	167	2.1	25.0	0.30	0.13	381.17	8.54	41	1.70	12	118
Callinectes sapidus	168	2.1	64.3	0.28	0.05	161.44	3.07	102	4.22	8	221
Gobiosoma spp.	124	1.6	10.7	0.20	0.18	837.24	15.38	12	0.23	9	19
Subtotals	7,409	93.1	.	.	.	.	.	.	.	2	221
Totals	**7,960**	**100.0**	**.**	**14.38**	**4.43**	**282.12**	**336.62**	**.**	**.**	**2**	**1,040**

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.

Table 4.39: Catch statistics for selected taxa collected in 84 6.1-m river otter trawl samples during Tampa Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Farfantepenaeus duorarum	309	3.9	65.5	0.54	0.10	173.57	4.99	11	0.30	2	33
Callinectes sapidus	168	2.1	64.3	0.28	0.05	161.44	3.07	102	4.22	8	221
Menticirrhus americanus	54	0.7	17.9	0.09	0.03	322.14	2.02	62	7.85	11	224
Cynoscion nebulosus	21	0.3	9.5	0.04	0.02	401.43	1.08	52	13.38	10	199
Cynoscion arenarius	19	0.2	3.6	0.03	0.02	589.74	1.35	30	6.54	11	120
Archosargus probatocephalus	10	0.1	7.1	0.02	0.01	401.80	0.40	120	21.39	39	238
Leiostomus xanthurus	8	0.1	1.2	0.01	0.01	916.52	1.20	84	7.45	58	107
Sciaenops ocellatus	6	0.1	2.4	0.01	0.01	777.08	0.75	27	2.05	20	35
Pogonias cromis	5	0.1	3.6	0.01	0.01	603.27	0.51	230	16.72	207	296
Paralichthys albigutta	3	<0.1	2.4	<0.01	<0.01	688.99	0.27	153	27.14	107	201
Elops saurus	1	<0.1	1.2	<0.01	<0.01	916.52	0.15	338	.	338	338
Lutjanus griseus	1	<0.1	1.2	<0.01	<0.01	916.52	0.13	98	.	98	98
Menticirrhus saxatilis	1	<0.1	1.2	<0.01	<0.01	916.52	0.13	29	.	29	29
Rachycentron canadum	1	<0.1	1.2	<0.01	<0.01	916.52	0.17	356	.	356	356
Totals	**607**	**7.6**	**.**	**1.05**	**0.12**	**103.64**	**4.99**	**.**	**.**	**2**	**356**

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.

4.6 Sarasota Bay

Sarasota Bay, located on the southwest coast of Florida, is a coastal lagoon that extends from Anna Maria Sound south to Venice Inlet. The bay comprises five embayments (Palma Sola, Sarasota, Roberts, Little Sarasota, and Blackburn bays), which were formed behind a barrier island complex. This system is connected to the Gulf of Mexico through five inlets: Anna Maria Sound, Longboat Pass, New Pass, Big Sarasota Pass, and Venice Inlet. Freshwater inflow enters the estuary through a series of creeks, bayous, and unnamed drainage ditches (Roat and McKeon 2010). Shoreline vegetation consists largely of mangroves and marsh grasses, and bottom substrates are typically characterized as sand, mud, oysters, or a combination thereof (Flannery 1989). Seagrass meadows are the dominant, submerged vegetative cover in Sarasota Bay and are widely distributed throughout the estuary (Haddad 1989).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in Sarasota Bay since 2009. The area sampled was divided into zones representing the five embayments designated by the Sarasota Bay Estuary Program (Zone A - Palma Sola Bay, Zone B - Sarasota Bay proper, Zone C - Roberts Bay, Zone D - Little Sarasota Bay, and Zone E - Blackburn Bay; Figure 4.6). Bi-monthly stratified-random sampling (SRS) was conducted in Zones A-E using 21.3-m bay seines and 183-m haul seines. All methods were the same as those described in Chapter 2. This section summarizes data collected by the FIM program during 2023 in Sarasota Bay.

Stratified-Random Sampling

A total of 65,805 animals, which included 84 taxa of fishes and 8 taxa of selected invertebrates, were collected from 154 Sarasota Bay SRS samples in 2023 (Table 4.40, Table A.16, Table A.17, Table A.18). *Eucinostomus* spp. (n=21,564) was the most numerous taxon collected, representing 32.8% of the total catch. *Lucania parva* (n=16,432) and *Lagodon rhomboides* (n=10,077) were the next most abundant taxa collected, accounting for an additional 40.3% of the total catch. A total of 28 Selected Taxa (n=3,119 animals) composed 4.7% of the total catch. *Farfantepenaeus duorarum* (n=1,303) was the most abundant Selected Taxon, representing 2% of the total catch. *Mugil cephalus* (n=430), *Archosargus probatocephalus* (n=359), *Centropomus undecimalis* (n=239), and *Callinectes sapidus* (n=137) were the next most abundant Selected Taxa, comprising 1.8% of the total catch. Collections in 2023 included 0 species new to the Sarasota Bay FIM collection.

Figure 4.6: Map of Sarasota Bay sampling area. Zones are labeled A-E.

Table 4.40: Summary of catch and effort data for Sarasota Bay stratified-random sampling, 2023.

Zone	21.3-m bay seine		183-m haul seine		Totals	
	Animals	Hauls	Animals	Hauls	Animals	Hauls
A	9,101	18	494	6	9,595	24
B	16,970	36	4,137	12	21,107	48
C	10,548	24	791	6	11,339	30
D	8,399	18	1,456	6	9,855	24
E	12,587	22	1,322	6	13,909	28
Totals	**57,605**	**118**	**8,200**	**36**	**65,805**	**154**

Bay Sampling

21.3-m Bay Seines

A total of 57,605 animals were collected in 118 21.3-m bay seines, representing 87.5% of the overall SRS catch (Table 4.40). Eucinostomus spp. (n=21,564) and Lucania parva (n=16,431) were the most abundant taxa, accounting for 66% of the bay seine catch (Table 4.41). The taxa most frequently caught in 21.3-m bay seines were *Eucinostomus* spp. (73.7% occurrence) and *Eucinostomus gula* (60.2% occurrence).

A total of 1,601 animals from 19 Selected Taxa were collected, representing 2.8% of the entire 21.3-m bay seine catch (Table 4.42). Farfantepenaeus duorarum (n=1,294) was the most abundant Selected Taxon, accounting for 80.8% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m bay seines were *Farfantepenaeus duorarum* (50.0% occurrence) and *Callinectes sapidus* (21.2% occurrence).

Table 4.41: Catch statistics for 10 dominant taxa collected in 118 21.3-m bay seine samples during Sarasota Bay stratified-random sampling, 2023.

	Number			**Density Estimate (animals/100m^2)**				**Standard Length (mm)**			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Eucinostomus spp.	21,564	37.4	73.7	130.53	18.87	157.03	1,313.57	27	0.04	12	39
Lucania parva	16,431	28.5	51.7	99.46	27.27	297.87	1,689.29	23	0.03	13	39
Lagodon rhomboides	5,556	9.6	59.3	33.63	9.61	310.34	718.57	32	0.24	13	162
Eucinostomus gula	3,552	6.2	60.2	21.50	3.97	200.79	234.29	51	0.13	40	80
Harengula jaguana	3,051	5.3	16.9	18.47	11.14	655.02	1,250.71	42	0.22	27	80
Menidia spp.	1,357	2.4	14.4	8.21	3.72	491.89	359.29	47	0.18	17	85
Farfantepenaeus duorarum	1,294	2.2	50.0	7.83	4.00	554.30	465.71	10	0.08	3	23
Floridichthys carpio	1,059	1.8	15.3	6.41	3.73	632.36	385.71	33	0.25	12	56
Anchoa mitchilli	985	1.7	5.1	5.96	4.59	835.53	527.14	35	0.16	23	53
Eucinostomus harengulus	646	1.1	32.2	3.91	0.83	231.48	43.57	53	0.40	40	117
Subtotals	55,495	96.2	.	.	.	.	.	.	.	3	162
Totals	**57,605**	**100.0**	**.**	**348.70**	**42.16**	**131.32**	**2,397.86**	**.**	**.**	**3**	**322**

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.

Table 4.42: Catch statistics for Selected Taxa collected in 118 21.3-m bay seine samples during Sarasota Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Farfantepenaeus duorarum	1,294	2.2	50.0	7.83	4.00	554.30	465.71	10	0.08	3	23
Lutjanus griseus	67	0.1	11.9	0.41	0.16	419.23	12.14	45	2.50	21	157
Callinectes sapidus	60	0.1	21.2	0.36	0.09	275.44	7.14	47	5.28	8	154
Archosargus probatocephalus	43	0.1	13.6	0.26	0.10	398.99	7.86	70	9.83	16	284
Lutjanus synagris	33	0.1	5.1	0.20	0.09	509.75	7.14	46	1.61	26	64
Cynoscion nebulosus	27	<0.1	12.7	0.16	0.04	276.47	2.14	50	6.71	16	173
Haemulon plumierii	20	<0.1	3.4	0.12	0.08	691.27	6.43	54	2.13	25	68
Mugil trichodon	18	<0.1	2.5	0.11	0.07	689.03	5.71	47	6.65	18	91
Menticirrhus saxatilis	10	<0.1	5.9	0.06	0.03	451.81	2.14	40	4.48	20	62
Mugil cephalus	8	<0.1	0.8	0.05	0.05	1,086.28	5.71	23	0.75	20	27
Centropomus undecimalis	4	<0.1	1.7	0.02	0.02	856.57	2.14	266	19.92	230	322
Trachinotus falcatus	4	<0.1	0.8	0.02	0.02	1,086.28	2.86	21	1.08	18	23
Sciaenops ocellatus	3	<0.1	1.7	0.02	0.01	806.89	1.43	146	87.61	51	321
Calamus penna	2	<0.1	0.8	0.01	0.01	1,086.28	1.43	44	8.00	36	52
Calamus spp.	2	<0.1	1.7	0.01	0.01	764.82	0.71	23	2.00	21	25
Leiostomus xanthurus	2	<0.1	1.7	0.01	0.01	764.82	0.71	12	0.50	11	12
Sphyraena barracuda	2	<0.1	1.7	0.01	0.01	764.82	0.71	84	52.50	32	137
Diplectrum formosum	1	<0.1	0.8	0.01	0.01	1,086.28	0.71	90	.	90	90
Mycteroperca microlepis	1	<0.1	0.8	0.01	0.01	1,086.28	0.71	190	.	190	190

Species	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Totals	**1,601**	**2.8**	**.**	**9.69**	**4.01**	**449.22**	**466.43**	**.**	**.**	**3**	**322**

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.

183-m Haul Seines

A total of 8,200 animals were collected in 36 183-m haul seines, representing 12.5% of the overall SRS catch (Table 4.40). Lagodon rhomboides (n=4,521) was the most abundant taxon, accounting for 55.1% of the 183-m haul seine catch (Table 4.43). The taxa most frequently caught in 183-m haul seines were *Archosargus probatocephalus* (83.3% occurrence), *Lagodon rhomboides* (75.0% occurrence), and *Centropomus undecimalis* (69.4% occurrence).

A total of 1,518 animals from 24 Selected Taxa were collected, representing 18.5% of the entire 183-m haul seine catch (Table 4.44). Mugil cephalus (n=422) and Archosargus probatocephalus (n=316) were the most abundant Selected Taxa, accounting for 48.6% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 183-m haul seines were *Archosargus probatocephalus* (83.3% occurrence) and *Centropomus undecimalis* (69.4% occurrence).

Table 4.43: Catch statistics for 10 dominant taxa collected in 36 183-m haul seine samples during Sarasota Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	4,521	55.1	75.0	118.97	35.92	186.12	1,103	100	0.42	31	198
Ariopsis felis	1,105	13.5	27.8	30.69	26.47	517.48	952	247	1.22	126	372
Eucinostomus gula	621	7.6	61.1	17.25	6.97	242.52	231	79	0.45	49	149
Mugil cephalus	422	5.1	38.9	11.72	8.75	448.02	315	250	1.84	130	457
Archosargus probatocephalus	316	3.9	83.3	7.90	1.86	148.94	50	205	4.82	50	422
Centropomus undecimalis	235	2.9	69.4	6.53	1.76	161.69	43	380	5.95	163	832
Diapterus auratus	86	1.0	16.7	2.39	1.58	396.02	53	228	3.22	98	276
Haemulon plumierii	82	1.0	11.1	2.28	1.97	519.84	71	82	0.86	54	97
Caranx hippos	80	1.0	5.6	2.22	2.08	562.68	75	150	1.92	73	175
Callinectes sapidus	77	0.9	52.8	2.14	0.57	158.51	12	106	3.48	32	188
Subtotals	7,545	92.0	.	.	.	.	.	.	.	31	832
Totals	**8,199**	**100.0**	**.**	**227.78**	**56.92**	**149.94**	**1,713**	**.**	**.**	**13**	**832**

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.

Table 4.44: Catch statistics for Selected Taxa collected in 36 183-m haul seine samples during Sarasota Bay stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil cephalus	422	5.1	38.9	11.72	8.75	448.02	315	250	1.84	130	457
Archosargus probatocephalus	316	3.9	83.3	7.90	1.86	148.94	50	205	4.82	50	422
Centropomus undecimalis	235	2.9	69.4	6.53	1.76	161.69	43	380	5.95	163	832
Haemulon plumierii	82	1.0	11.1	2.28	1.97	519.84	71	82	0.86	54	97
Caranx hippos	80	1.0	5.6	2.22	2.08	562.68	75	150	1.92	73	175
Callinectes sapidus	77	0.9	52.8	2.14	0.57	158.51	12	106	3.48	32	188
Cynoscion nebulosus	54	0.7	25.0	1.50	0.68	272.55	21	228	9.91	101	394
Lutjanus griseus	43	0.5	36.1	1.19	0.42	212.57	11	130	8.79	64	295
Mugil trichodon	43	0.5	22.2	1.19	0.46	233.24	12	193	4.76	122	268
Elops saurus	35	0.4	13.9	0.97	0.70	434.64	25	296	11.30	231	438
Lutjanus synagris	25	0.3	8.3	0.69	0.56	486.59	20	93	4.52	72	179
Mugil curema	21	0.3	11.1	0.58	0.42	434.41	15	203	10.24	130	293
Sphyraena barracuda	20	0.2	16.7	0.56	0.26	280.33	7	266	14.81	182	375
Mycteroperca microlepis	17	0.2	13.9	0.47	0.22	279.50	5	180	8.41	114	232
Sciaenops ocellatus	11	0.1	19.4	0.31	0.12	232.33	3	444	36.08	315	679
Farfantepenaeus duorarum	9	0.1	16.7	0.25	0.11	259.67	3	19	1.57	13	28
Trachinotus falcatus	9	0.1	8.3	0.25	0.16	386.93	5	111	20.57	73	272
Pogonias cromis	6	0.1	2.8	0.17	0.17	600.00	6	319	11.94	286	369
Trachinotus carolinus	5	0.1	5.6	0.14	0.11	491.44	4	280	23.21	247	370

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Calamus penna	4	<0.1	8.3	0.11	0.07	358.57	2	82	7.93	72	106
Argopecten irradians	1	<0.1	2.8	0.03	0.03	600.00	1	38	.	38	38
Brevoortia spp.	1	<0.1	2.8	0.03	0.03	600.00	1	235	.	235	235
Ocyurus chrysurus	1	<0.1	2.8	0.03	0.03	600.00	1	90	.	90	90
Paralichthys albigutta	1	<0.1	2.8	0.03	0.03	600.00	1	250	.	250	250
Totals	**1,518**	**18.5**	**.**	**42.17**	**10.55**	**150.08**	**322**	**.**	**.**	**13**	**832**

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.

4.7 Charlotte Harbor

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

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in Charlotte Harbor since 1989. The area sampled was divided into four geographically-defined bay zones (A–D) and three riverine zones (K, M, and P; Figure 4.7). Stratified-random sampling (SRS) was conducted in Zones A–D monthly using 21.3-m bay seines and 183-m haul seines and quarterly using 6.1-m bay otter trawls. SRS was conducted in Zones M and P in every month except March, May, and July with 21.3-m river seines and quarterly with 6.1-m river otter trawls. SRS was conducted in every month except March, May, and July in Zone K with 21.3-m river seines (starting in 2016). Beginning in 2016, tidal creeks in Zones A, B, and C were sampled monthly using 21.3-m river seines. All methods were the same as those described in Chapter 2. This section summarizes data collected by the FIM program during 2023 in Charlotte Harbor.

Stratified-Random Sampling

A total of 285,837 animals, which included 140 taxa of fishes and 10 taxa of selected invertebrates, were collected from 1,122 Charlotte Harbor SRS samples in 2023 (Table 4.45, Table A.19, Table A.20, Table A.21). *Anchoa mitchilli* (n=82,041) was the most numerous taxon collected, representing 28.7% of the total catch. *Eucinostomus* spp. (n=54,719) and *Lagodon rhomboides* (n=34,124) were the next most abundant taxa collected, accounting for an additional 31.1% of the total catch. A total of 43 selected taxa (n=11,496 animals) composed 4% of the total catch. *Farfantepenaeus duorarum* (n=3,834) was the most abundant Selected Taxon, representing 1.3% of the total catch. *Centropomus undecimalis* (n=1,296), *Sciaenops ocellatus* (n=1,037), *Archosargus probatocephalus* (n=1,005), and *Callinectes sapidus* (n=656) were the next most abundant selected taxa, comprising 1.4% of the total catch. Collections in 2023 included 1 species new to the Charlotte Harbor FIM collection: *Microgobius microlepis*.

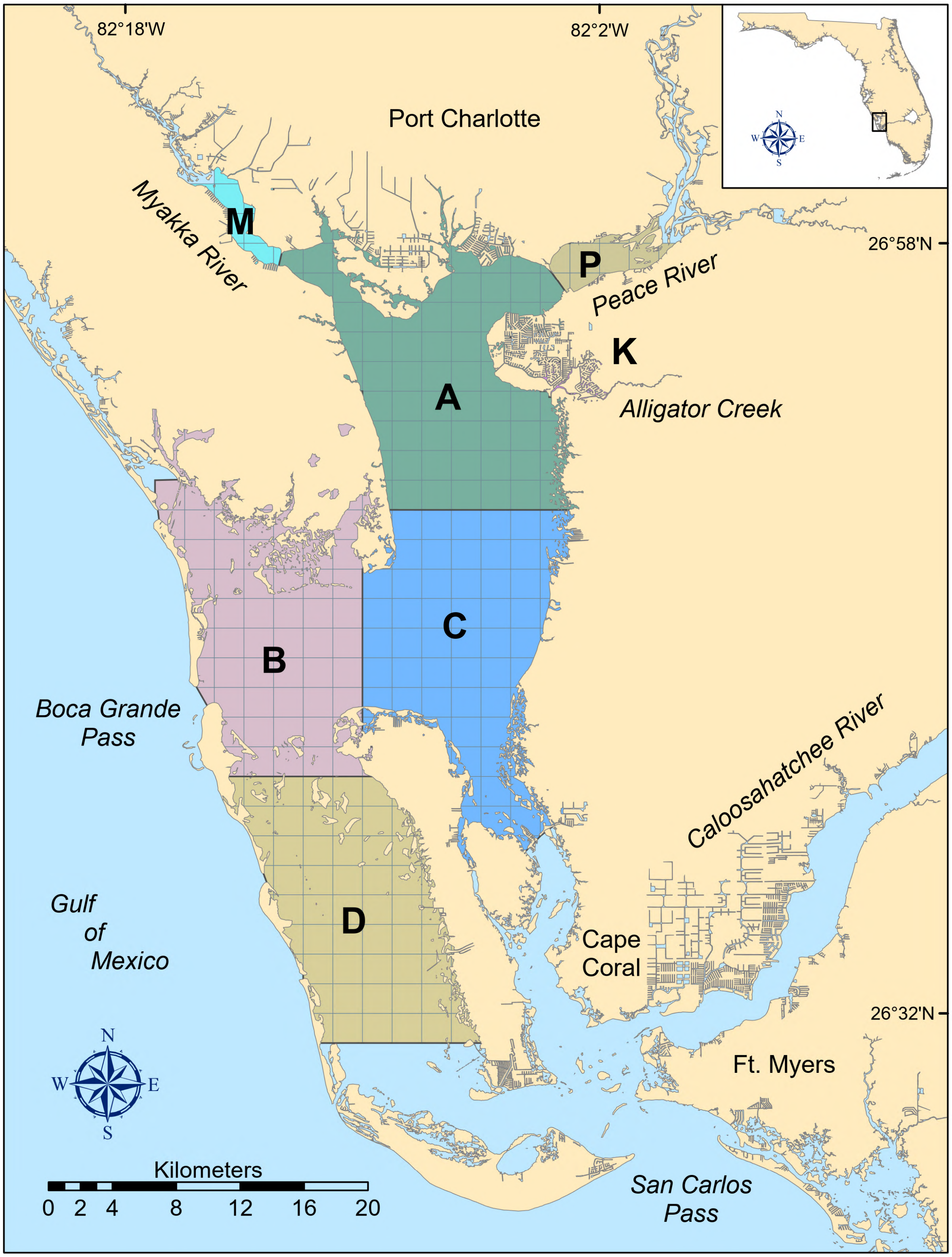

Figure 4.7: Map of Charlotte Harbor sampling area. Zones are labeled A–D (bay zones) and K, M, and P (river zones).

Table 4.45: Summary of catch and effort data for Charlotte Harbor stratified-random sampling, 2023.

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	14,705	120	27,104	90	2,763	60	2,657	28	47,229	298
B	42,800	96	25,815	90	21,665	48	2,855	24	93,135	258
C	17,786	96	14,251	90	5,133	48	1,704	24	38,874	258
D	31,745	96	.	.	15,536	48	2,680	20	49,961	164
K	.	.	29,996	36	.	.	.	.	29,996	36
M	.	.	13,744	36	.	.	4,841	18	18,585	54
P	.	.	6,710	36	.	.	1,347	18	8,057	54
Totals	**107,036**	**408**	**117,620**	**378**	**45,097**	**204**	**16,084**	**132**	**285,837**	**1,122**

Bay Sampling

21.3-m Bay Seines

A total of 107,036 animals were collected in 408 21.3-m bay seines, representing 37.4% of the overall SRS catch (Table 4.45). Eucinostomus spp. (n=34,066) and Lucania parva (n=20,771) were the most abundant taxa, accounting for 51.2% of the bay seine catch (Table 4.46). The taxa most frequently caught in 21.3-m bay seines were *Eucinostomus* spp. (73.3% occurrence) and *Eucinostomus gula* (57.4% occurrence).

A total of 3,733 animals from 28 selected taxa were collected, representing 3.5% of the entire 21.3-m bay seine catch (Table 4.47). Farfantepenaeus duorarum (n=2,314) was the most abundant Selected Taxon, accounting for 62% of the selected taxa collected by this gear. The selected taxa most frequently caught in 21.3-m bay seines were *Farfantepenaeus duorarum* (49.5% occurrence) and *Cynoscion nebulosus* (21.3% occurrence).

Table 4.46: Catch statistics for 10 dominant taxa collected in 408 21.3-m bay seine samples during Charlotte Harbor stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Eucinostomus spp.	34,066	31.8	73.3	59.35	5.59	190.78	844.29	28	0.04	8	41
Lucania parva	20,771	19.4	41.2	36.36	6.55	364.05	1,180.00	25	0.03	11	44
Anchoa mitchilli	18,338	17.1	8.6	32.03	20.38	1,287.27	8,045.71	34	0.04	17	59
Eucinostomus gula	7,488	7.0	57.4	13.08	1.31	202.52	197.86	54	0.11	40	103
Lagodon rhomboides	5,974	5.6	42.2	10.43	1.71	330.91	320.71	42	0.22	11	174
Harengula jaguana	2,889	2.7	12.3	5.03	1.72	692.52	434.29	40	0.26	22	85
Menidia spp.	2,533	2.4	17.9	4.43	1.48	675.94	412.14	41	0.29	16	82
Farfantepenaeus duorarum	2,314	2.2	49.5	4.04	0.82	412.36	221.43	9	0.07	3	30
Eucinostomus harengulus	2,260	2.1	37.3	3.96	0.57	289.73	111.43	53	0.22	40	99
Microgobius gulosus	1,904	1.8	44.6	3.33	0.72	434.18	260.00	30	0.15	11	53
Subtotals	98,537	92.1	.	.	.	.	.	.	.	3	174
Totals	**107,036**	**100.0**	**.**	**187.39**	**24.21**	**260.94**	**8,592.14**	**.**	**.**	**3**	**621**

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.

Table 4.47: Catch statistics for selected taxa collected in 408 21.3-m bay seine samples during Charlotte Harbor stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Farfantepenaeus duorarum	2,314	2.2	49.5	4.04	0.82	412.36	221.43	9	0.07	3	30
Cynoscion nebulosus	359	0.3	21.3	0.63	0.11	345.67	22.86	40	0.97	15	168
Sciaenops ocellatus	275	0.3	8.1	0.48	0.15	634.49	41.43	43	4.24	13	621
Callinectes sapidus	135	0.1	16.4	0.24	0.04	328.32	8.57	50	4.60	7	194
Archosargus probatocephalus	133	0.1	11.5	0.23	0.04	383.97	7.14	62	4.81	13	292
Haemulon plumierii	126	0.1	3.4	0.22	0.12	1,113.77	45.71	42	1.66	20	102
Lutjanus griseus	114	0.1	11.8	0.20	0.04	436.04	11.43	55	3.49	14	204
Lutjanus synagris	111	0.1	4.9	0.19	0.09	953.50	29.29	42	1.02	17	83
Menticirrhus americanus	49	<0.1	2.7	0.09	0.05	1,131.15	17.86	24	1.20	11	61
Centropomus undecimalis	24	<0.1	4.2	0.04	0.01	549.92	2.86	242	32.03	29	519
Mugil trichodon	22	<0.1	0.7	0.04	0.03	1,604.94	12.14	18	0.95	11	26
Menticirrhus saxatilis	15	<0.1	2.2	0.03	0.01	791.33	2.86	33	9.30	11	142
Trachinotus falcatus	14	<0.1	1.0	0.02	0.02	1,605.47	7.86	29	2.44	18	48
Calamus penna	10	<0.1	1.5	0.02	0.01	1,103.17	3.57	41	2.57	35	63
Mycteroperca microlepis	6	<0.1	1.0	0.01	0.01	1,163.32	2.14	182	14.85	142	225
Paralichthys albigutta	5	<0.1	1.0	0.01	<0.01	1,065.45	1.43	104	32.84	45	191
Cynoscion arenarius	4	<0.1	1.0	0.01	<0.01	1,006.22	0.71	36	6.69	18	50
Calamus spp.	3	<0.1	0.7	0.01	<0.01	1,163.32	0.71	25	2.60	21	30
Haemulon aurolineatum	3	<0.1	0.2	0.01	0.01	2,019.90	2.14	20	0.33	19	20

Species	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Mugil cephalus	2	<0.1	0.5	<0.01	<0.01	1,426.53	0.71	208	187.00	21	395
Sphyraena barracuda	2	<0.1	0.5	<0.01	<0.01	1,426.53	0.71	200	85.00	115	285
Brevoortia spp.	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	27	.	27	27
Calamus proridens	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	38	.	38	38
Diplectrum formosum	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	47	.	47	47
Epinephelus itajara	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	18	.	18	18
Epinephelus morio	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	116	.	116	116
Mugil curema	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	31	.	31	31
Pomatomus saltatrix	1	<0.1	0.2	<0.01	<0.01	2,019.90	0.71	40	.	40	40
Totals	**3,733**	**3.5**	**.**	**6.54**	**0.93**	**288.68**	**231.43**	**.**	**.**	**3**	**621**

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.

183-m Haul Seines

A total of 45,097 animals were collected in 204 183-m haul seines, representing 15.8% of the overall SRS catch (Table 4.45). Lagodon rhomboides (n=26,876) was the most abundant taxon, accounting for 59.6% of the 183-m haul seine catch (Table 4.48). The taxa most frequently caught in 183-m haul seines were *Archosargus probatocephalus* (53.4% occurrence), *Lagodon rhomboides* (51.0% occurrence), and *Sphoeroides nephelus* (50.5% occurrence).

A total of 3,720 animals from 36 selected taxa were collected, representing 8.2% of the entire 183-m haul seine catch (Table 4.49). Archosargus probatocephalus (n=808) and Centropomus undecimalis (n=647) were the most abundant selected taxa, accounting for 39.1% of the selected taxa collected by this gear. The selected taxa most frequently caught in 183-m haul seines were *Archosargus probatocephalus* (53.4% occurrence) and *Centropomus undecimalis* (50.0% occurrence).

Table 4.48: Catch statistics for 10 dominant taxa collected in 204 183-m haul seine samples during Charlotte Harbor stratified-random sampling, 2023.

	Number			**Density Estimate (animals/set)**				**Standard Length (mm)**			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	26,876	59.6	51.0	131.75	24.10	261.32	3,121	104	0.13	11	205
Eucinostomus gula	6,251	13.9	43.1	30.64	11.84	551.99	2,143	83	0.13	40	122
Harengula jaguana	1,990	4.4	8.8	9.75	7.75	1,135.36	1,563	113	0.28	51	139
Ariopsis felis	1,810	4.0	35.8	8.87	2.47	397.46	278	280	0.84	176	391
Bairdiella chrysoura	1,541	3.4	9.8	7.55	6.50	1,228.62	1,324	116	0.31	82	164
Archosargus probatocephalus	808	1.8	53.4	3.96	0.78	280.20	123	163	2.95	39	444
Eucinostomus harengulus	721	1.6	26.5	3.53	1.41	569.15	268	95	0.31	45	122
Centropomus undecimalis	647	1.4	50.0	3.17	0.49	222.57	55	438	4.85	155	895
Sphoeroides nephelus	420	0.9	50.5	2.06	0.28	197.00	33	133	1.72	40	223
Haemulon plumierii	336	0.7	4.4	1.65	0.99	857.68	160	92	0.62	71	184
Subtotals	41,400	91.7	.	.	.	.	.	.	.	11	895
Totals	**45,097**	**100.0**	**.**	**221.06**	**38.13**	**246.37**	**4,792**	**.**	**.**	**8**	**1,113**

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.

Table 4.49: Catch statistics for selected taxa collected in 204 183-m haul seine samples during Charlotte Harbor stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Archosargus probatocephalus	808	1.8	53.4	3.96	0.78	280.20	123	163	2.95	39	444
Centropomus undecimalis	647	1.4	50.0	3.17	0.49	222.57	55	438	4.85	155	895
Haemulon plumierii	336	0.7	4.4	1.65	0.99	857.68	160	92	0.62	71	184
Callinectes sapidus	282	0.6	37.3	1.38	0.31	320.96	47	124	2.13	33	204
Elops saurus	214	0.5	16.2	1.05	0.40	545.59	73	294	3.29	128	457
Sciaenops ocellatus	213	0.5	31.4	1.04	0.18	246.12	16	357	9.35	95	669
Lutjanus griseus	163	0.4	24.0	0.80	0.15	268.85	14	161	3.38	51	272
Lutjanus synagris	145	0.3	6.4	0.71	0.38	771.22	69	95	0.99	31	127
Mugil cephalus	134	0.3	23.0	0.66	0.14	298.03	18	289	6.16	120	449
Mugil trichodon	127	0.3	11.8	0.62	0.20	451.51	23	174	3.41	103	261
Trachinotus falcatus	126	0.3	4.4	0.62	0.36	834.75	56	148	7.05	56	270
Cynoscion nebulosus	119	0.3	17.6	0.58	0.14	352.76	18	229	8.58	100	482
Mugil curema	68	0.2	9.8	0.33	0.09	406.84	10	216	5.77	132	302
Caranx hippos	66	0.1	11.3	0.32	0.09	383.59	11	372	18.78	94	642
Mycteroperca microlepis	57	0.1	10.3	0.28	0.08	407.42	9	196	4.06	93	262
Trachinotus carolinus	55	0.1	4.9	0.27	0.13	689.83	23	263	4.69	180	335
Calamus penna	29	0.1	7.4	0.14	0.04	449.47	5	109	6.15	59	165
Sphyraena barracuda	28	0.1	6.4	0.14	0.05	474.65	6	249	11.47	86	392
Farfantepenaeus duorarum	21	<0.1	2.9	0.10	0.05	755.67	9	20	1.34	8	28

Species	Number		% Occur	Density Estimate (animals/set)				Standard Length (mm)			
	No.	%		Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Ocyurus chrysurus	17	<0.1	1.5	0.08	0.06	1,063.96	12	97	1.69	83	109
Paralichthys albigutta	16	<0.1	6.9	0.08	0.02	407.59	3	228	19.29	76	333
Epinephelus morio	12	<0.1	1.5	0.06	0.04	871.04	5	137	2.91	125	157
Sphyrna tiburo	7	<0.1	2.9	0.03	0.01	605.38	2	712	15.32	650	760
Diplectrum formosum	6	<0.1	2.0	0.03	0.02	747.94	2	137	8.68	119	171
Pogonias cromis	5	<0.1	2.0	0.02	0.01	750.98	2	330	77.32	212	630
Megalops atlanticus	4	<0.1	1.0	0.02	0.01	1,007.46	2	563	33.63	500	649
Carcharhinus leucas	2	<0.1	1.0	0.01	0.01	1,007.46	1	1,034	79.00	955	1,113
Leiostomus xanthurus	2	<0.1	1.0	0.01	0.01	1,007.46	1	88	3.50	85	92
Lutjanus analis	2	<0.1	0.5	0.01	0.01	1,428.29	2	113	2.00	111	115
Menippe spp.	2	<0.1	1.0	0.01	0.01	1,007.46	1	66	6.50	59	72
Negaprion brevirostris	2	<0.1	1.0	0.01	0.01	1,007.46	1	793	95.00	698	888
Brevoortia spp.	1	<0.1	0.5	<0.01	<0.01	1,428.29	1	92	.	92	92
Calamus arctifrons	1	<0.1	0.5	<0.01	<0.01	1,428.29	1	140	.	140	140
Calamus proridens	1	<0.1	0.5	<0.01	<0.01	1,428.29	1	69	.	69	69
Menticirrhus saxatilis	1	<0.1	0.5	<0.01	<0.01	1,428.29	1	128	.	128	128
Mycteroperca bonaci	1	<0.1	0.5	<0.01	<0.01	1,428.29	1	176	.	176	176
Totals	**3,720**	**8.2**	**.**	**18.24**	**1.96**	**153.66**	**217**	**.**	**.**	**8**	**1,113**

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.

6.1-m Bay Otter Trawls

A total of 9,896 animals were collected in 96 6.1-m bay otter trawls, representing 3.5% of the overall SRS catch (Table 4.45). Portunus spp. (n=2,117), Eucinostomus gula (n=1,443), Bairdiella chrysoura (n=1,162), and Lagodon rhomboides (n=1,121) were the most abundant taxa, accounting for 59% of the 6.1-m bay otter trawl catch (Table 4.50). The taxa most frequently caught in 6.1-m bay otter trawls were *Portunus* spp. (68.8% occurrence), *Farfantepenaeus duorarum* (61.5% occurrence), and *Prionotus scitulus* (60.4% occurrence).

A total of 1,296 animals from 19 selected taxa were collected, representing 13.1% of the entire 6.1-m bay otter trawl catch (Table 4.51). Farfantepenaeus duorarum (n=680), Lutjanus synagris (n=180), and Menticirrhus americanus (n=80) were the most abundant selected taxa, accounting for 72.5% of the selected taxa collected by this gear. The selected taxa most frequently caught in 6.1-m bay otter trawls were *Farfantepenaeus duorarum* (61.5% occurrence), *Lutjanus synagris* (26.0% occurrence), and *Callinectes sapidus* (24.0% occurrence).

Table 4.50: Catch statistics for 10 dominant taxa collected in 96 6.1-m bay otter trawl samples during Charlotte Harbor stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Portunus spp.	2,117	21.4	68.8	1.49	0.38	248.81	29.75	47	0.25	8	116
Eucinostomus gula	1,443	14.6	45.8	1.02	0.25	243.02	13.36	74	0.39	40	117
Bairdiella chrysoura	1,162	11.7	22.9	0.82	0.65	784.79	62.80	37	0.45	16	130
Lagodon rhomboides	1,121	11.3	43.8	0.78	0.20	249.53	13.42	84	0.71	13	163
Farfantepenaeus duorarum	680	6.9	61.5	0.48	0.11	227.47	8.09	14	0.22	4	39
Anchoa mitchilli	474	4.8	7.3	0.33	0.22	646.30	20.04	41	0.48	20	61
Eucinostomus spp.	456	4.6	33.3	0.32	0.09	288.48	6.27	28	0.31	12	39
Trinectes maculatus	358	3.6	32.3	0.26	0.10	387.76	8.52	63	0.50	42	99
Prionotus scitulus	287	2.9	60.4	0.20	0.04	210.33	2.56	79	1.94	18	185
Lutjanus synagris	180	1.8	26.0	0.13	0.04	293.67	2.23	82	2.22	15	171
Subtotals	8,278	83.6	.	.	.	.	.	.	.	4	185
Totals	**9,896**	**100.0**	**.**	**6.97**	**0.95**	**132.90**	**66.31**	**.**	**.**	**4**	**730**

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.

Table 4.51: Catch statistics for selected taxa collected in 96 6.1-m bay otter trawl samples during Charlotte Harbor stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Farfantepenaeus duorarum	680	6.9	61.5	0.48	0.11	227.47	8.09	14	0.22	4	39
Lutjanus synagris	180	1.8	26.0	0.13	0.04	293.67	2.23	82	2.22	15	171
Menticirrhus americanus	80	0.8	9.4	0.06	0.03	511.69	1.96	82	5.92	14	245
Callinectes sapidus	79	0.8	24.0	0.06	0.02	268.87	0.74	91	5.56	18	179
Menippe spp.	68	0.7	17.7	0.05	0.02	334.03	1.15	33	2.17	8	86
Haemulon plumierii	61	0.6	6.2	0.04	0.02	553.77	1.89	49	4.56	21	230
Cynoscion arenarius	57	0.6	3.1	0.04	0.03	804.41	3.10	57	1.54	20	93
Mycteroperca microlepis	34	0.3	10.4	0.02	0.01	444.99	0.88	147	10.43	26	217
Diplectrum formosum	24	0.2	10.4	0.02	0.01	343.52	0.34	103	6.38	39	147
Cynoscion nebulosus	11	0.1	9.4	0.01	<0.01	331.90	0.13	87	17.18	22	173
Archosargus probatocephalus	4	<0.1	2.1	<0.01	<0.01	689.16	0.13	52	18.81	19	88
Paralichthys albigutta	4	<0.1	4.2	<0.01	<0.01	482.10	0.07	224	5.61	207	232
Epinephelus morio	3	<0.1	1.0	<0.01	<0.01	979.80	0.20	104	16.37	71	122
Ocyurus chrysurus	3	<0.1	2.1	<0.01	<0.01	727.22	0.13	48	22.00	26	92
Calamus spp.	2	<0.1	2.1	<0.01	<0.01	689.16	0.07	14	3.00	11	17
Lutjanus griseus	2	<0.1	2.1	<0.01	<0.01	689.16	0.07	16	4.50	12	21
Menticirrhus saxatilis	2	<0.1	2.1	<0.01	<0.01	689.16	0.07	40	14.50	25	54
Calamus proridens	1	<0.1	1.0	<0.01	<0.01	979.80	0.07	91	.	91	91
Centropristis striata	1	<0.1	1.0	<0.01	<0.01	979.80	0.07	164	.	164	164

Species	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Totals	**1,296**	**13.1**	**.**	**0.92**	**0.14**	**153.45**	**8.30**	**.**	**.**	**4**	**245**

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.

River Sampling

Tidal Creeks

21.3-m River Seines

A total of 67,170 animals were collected in 270 21.3-m river seines in tidal creeks, representing 23.5% of the overall SRS catch (Table 4.45). Anchoa mitchilli (n=21,946) was the most abundant taxon collected, accounting for 32.7% of the 21.3-m river seine catch (Table 4.52). Eucinostomus spp. (n=15,497) and Menidia spp. (n=5,241) were the next most abundant taxa, accounting for an additional 30.9% of the 21.3-m river seine catch. The taxa most frequently caught in 21.3-m river seines in tidal creeks were *Eucinostomus* spp. (80.0% occurrence), *Eucinostomus harengulus* (71.1% occurrence), and *Menidia* spp. (50.4% occurrence).

A total of 1,872 animals from 15 selected taxa were collected, representing 2.8% of the entire 21.3-m river seine catch in tidal creeks (Table 4.53). Centropomus undecimalis (n=604), and Sciaenops ocellatus (n=505) were the most abundant selected taxa, accounting for 59.2% of the selected taxa collected by this gear. The selected taxa most frequently caught in 21.3-m river seines in tidal creeks were *Farfantepenaeus duorarum* (34.4% occurrence) and *Centropomus undecimalis* (27.4% occurrence).

Table 4.52: Catch statistics for 10 dominant taxa collected in 270 21.3-m creek seine samples during Charlotte Harbor stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	21,946	32.7	16.3	118.65	42.26	587.38	7,341.18	34	0.04	16	58
Eucinostomus spp.	15,497	23.1	80.0	84.09	8.07	157.97	704.41	27	0.05	11	39
Menidia spp.	5,241	7.8	50.4	28.55	4.73	272.05	735.29	39	0.14	11	91
Lucania parva	4,713	7.0	45.2	25.67	5.56	356.11	820.59	24	0.06	12	38
Harengula jaguana	4,460	6.6	10.7	24.29	12.25	828.74	2,445.59	39	0.18	19	75
Eucinostomus harengulus	3,376	5.0	71.1	18.39	2.07	184.72	257.35	54	0.18	40	108
Eugerres plumieri	1,681	2.5	31.5	9.16	2.07	371.10	302.94	44	0.71	10	232
Eucinostomus gula	1,481	2.2	37.0	8.07	1.54	312.79	270.59	51	0.22	40	86
Microgobius gulosus	1,354	2.0	46.7	7.37	1.54	342.81	291.18	25	0.16	11	54
Opisthonema oglinum	1,197	1.8	1.9	6.52	6.47	1,629.41	1,745.59	33	0.19	26	56
Subtotals	60,946	90.7	.	.	.	.	.	.	.	10	232
Totals	**67,170**	**100.0**	**.**	**365.85**	**48.24**	**216.67**	**7,394.12**	**.**	**.**	**2**	**737**

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.

Table 4.53: Catch statistics for selected taxa collected in 270 21.3-m creek seine samples during Charlotte Harbor stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Centropomus undecimalis	604	0.9	27.4	3.29	1.75	876.36	452.94	144	3.70	21	737
Sciaenops ocellatus	505	0.8	20.0	2.75	1.47	875.54	385.29	60	2.53	13	557
Farfantepenaeus duorarum	397	0.6	34.4	2.16	0.49	374.74	111.76	8	0.16	2	19
Cynoscion nebulosus	107	0.2	5.9	0.58	0.27	757.57	60.29	46	2.84	16	139
Leiostomus xanthurus	77	0.1	0.7	0.42	0.30	1,187.87	69.12	24	0.45	18	45
Callinectes sapidus	68	0.1	12.6	0.37	0.08	339.68	8.82	45	5.58	8	182
Archosargus probatocephalus	45	0.1	9.3	0.25	0.07	453.24	13.24	93	8.25	19	293
Lutjanus griseus	34	0.1	6.3	0.19	0.05	458.62	7.35	59	4.33	29	156
Mugil trichodon	9	<0.1	1.1	0.05	0.03	979.91	5.88	72	8.33	43	101
Mugil cephalus	8	<0.1	1.5	0.04	0.03	959.97	5.88	147	48.06	23	364
Sphyraena barracuda	6	<0.1	0.7	0.03	0.03	1,395.43	7.35	282	13.65	236	327
Brevoortia spp.	5	<0.1	0.4	0.03	0.03	1,643.17	7.35	55	4.47	44	66
Cynoscion arenarius	3	<0.1	0.7	0.02	0.01	1,222.92	2.94	48	13.86	24	72
Elops saurus	2	<0.1	0.7	0.01	0.01	1,159.73	1.47	142	113.00	29	255
Mugil curema	2	<0.1	0.7	0.01	0.01	1,159.73	1.47	204	87.50	116	291
Totals	**1,872**	**2.8**	**.**	**10.20**	**2.38**	**382.91**	**452.94**	**.**	**.**	**2**	**737**

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.

Rivers

21.3-m River Seines

A total of 50,450 animals were collected in 108 21.3-m river seines, representing 17.6% of the overall SRS catch (Table 4.45). Anchoa mitchilli (n=36,233) was the most abundant taxon collected, accounting for 71.8% of the 21.3-m river seine catch (Table 4.54). Eucinostomus spp. (n=4,677) and Opisthonema oglinum (n=2,497) were the next most abundant taxa, accounting for an additional 14.2% of the 21.3-m river seine catch. The taxa most frequently caught in 21.3-m river seines were *Eucinostomus* spp. (82.4% occurrence), *Eucinostomus harengulus* (72.2% occurrence), and *Menidia* spp. (68.5% occurrence).

A total of 409 animals from 12 selected taxa were collected, representing 0.8% of the entire 21.3-m river seine catch (Table 4.55). Farfantepenaeus duorarum (n=238), and Sciaenops ocellatus (n=44) were the most abundant selected taxa, accounting for 68.9% of the selected taxa collected by this gear. The selected taxa most frequently caught in 21.3-m river seines were *Farfantepenaeus duorarum* (33.3% occurrence) and *Sciaenops ocellatus* (14.8% occurrence).

Table 4.54: Catch statistics for 10 dominant taxa collected in 108 21.3-m river seine samples during Charlotte Harbor stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	36,233	71.8	40.7	493.37	232.87	490.51	22,541.18	31	0.02	15	55
Eucinostomus spp.	4,677	9.3	82.4	63.10	9.83	162.63	633.82	27	0.09	12	39
Opisthonema oglinum	2,497	4.9	1.9	34.00	33.99	1,038.81	3,670.59	33	0.04	26	37
Menidia spp.	2,015	4.0	68.5	27.44	6.21	235.29	580.88	38	0.21	16	75
Eucinostomus harengulus	1,131	2.2	72.2	15.40	2.21	149.34	135.29	60	0.44	40	109
Gambusia holbrooki	622	1.2	10.2	8.47	6.54	802.60	695.59	29	0.19	17	40
Eucinostomus gula	477	0.9	41.7	6.50	1.72	275.05	120.59	51	0.36	40	95
Eugerres plumieri	299	0.6	28.7	4.07	1.46	373.18	139.71	40	1.74	15	252
Lophogobius cyprinoides	259	0.5	29.6	3.53	1.27	373.62	119.12	26	0.45	12	53
Microgobius gulosus	249	0.5	40.7	3.39	0.89	271.71	61.76	27	0.49	12	50
Subtotals	48,459	95.9	.	.	.	.	.	.	.	12	252
Totals	**50,450**	**100.0**	**.**	**686.96**	**266.38**	**402.98**	**26,730.88**	**.**	**.**	**3**	**415**

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.

Table 4.55: Catch statistics for selected taxa collected in 108 21.3-m river seine samples during Charlotte Harbor stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Farfantepenaeus duorarum	238	0.5	33.3	3.24	1.76	562.88	188.24	7	0.16	3	18
Sciaenops ocellatus	44	0.1	14.8	0.60	0.18	307.63	11.76	53	7.03	17	331
Menticirrhus americanus	28	0.1	3.7	0.38	0.23	635.81	22.06	46	2.32	19	62
Lutjanus griseus	27	0.1	14.8	0.37	0.10	290.02	5.88	89	10.23	19	218
Callinectes sapidus	25	<0.1	13.9	0.34	0.10	315.89	7.35	35	8.56	7	173
Centropomus undecimalis	21	<0.1	13.0	0.29	0.09	325.71	7.35	300	17.23	23	415
Archosargus probatocephalus	12	<0.1	10.2	0.16	0.05	309.66	2.94	138	13.14	73	217
Cynoscion nebulosus	9	<0.1	7.4	0.12	0.04	371.41	2.94	42	5.03	18	62
Elops saurus	2	<0.1	0.9	0.03	0.03	1,039.23	2.94	150	7.00	143	157
Brevoortia spp.	1	<0.1	0.9	0.01	0.01	1,039.23	1.47	45	.	45	45
Mugil curema	1	<0.1	0.9	0.01	0.01	1,039.23	1.47	160	.	160	160
Mugil trichodon	1	<0.1	0.9	0.01	0.01	1,039.23	1.47	14	.	14	14
Totals	**409**	**0.8**	**.**	**5.57**	**1.81**	**337.31**	**189.71**	**.**	**.**	**3**	**415**

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.

6.1-m River Otter Trawls

A total of 6,188 animals were collected in 36 6.1-m river otter trawls, representing 2.2% of the overall SRS catch (Table 4.45). Anchoa mitchilli (n=5,050) was the most abundant taxon collected, accounting for 81.6% of the 6.1-m river otter trawl catch (Table 4.56). The taxa most frequently caught in 6.1-m river otter trawls were *Farfantepenaeus duorarum* (72.2% occurrence), *Trinectes maculatus* (63.9% occurrence), and *Callinectes sapidus* (55.6% occurrence).

A total of 466 animals from 8 selected taxa were collected, representing 7.5% of the entire 6.1-m river otter trawl catch (Table 4.57). Farfantepenaeus duorarum (n=184), Menticirrhus americanus (n=114), and Cynoscion arenarius (n=79) were the most abundant selected taxa, accounting for 80.9% of the selected taxa collected by this gear. The selected taxa most frequently caught in the 6.1-m river otter trawls were *Farfantepenaeus duorarum* (72.2% occurrence) and *Callinectes sapidus* (55.6% occurrence).

Table 4.56: Catch statistics for 10 dominant taxa collected in 36 6.1-m river otter trawl samples during Charlotte Harbor stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	5,050	81.6	47.2	18.93	11.37	360.31	385.32	27	0.08	13	65
Trinectes maculatus	344	5.6	63.9	1.29	0.46	215.71	12.68	43	0.84	12	96
Farfantepenaeus duorarum	184	3.0	72.2	0.67	0.17	151.93	4.32	11	0.30	4	26
Menticirrhus americanus	114	1.8	33.3	0.43	0.18	250.65	4.99	54	5.02	13	262
Bairdiella chrysoura	82	1.3	25.0	0.31	0.13	246.71	2.83	55	2.06	18	107
Cynoscion arenarius	79	1.3	27.8	0.30	0.12	246.92	3.37	41	2.08	14	94
Callinectes sapidus	67	1.1	55.6	0.25	0.07	158.43	2.02	97	6.35	14	192
Microgobius gulosus	66	1.1	33.3	0.24	0.10	259.65	3.51	24	0.91	15	43
Eugerres plumieri	34	0.5	13.9	0.13	0.09	433.21	3.24	63	3.13	20	111
Eucinostomus gula	26	0.4	22.2	0.10	0.04	233.13	0.94	55	2.53	41	80
Subtotals	6,046	97.7	.	.	.	.	.	.	.	4	262
Totals	**6,188**	**100.0**	**.**	**23.19**	**11.32**	**292.89**	**388.29**	**.**	**.**	**4**	**760**

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.

Table 4.57: Catch statistics for selected taxa collected in 36 6.1-m river otter trawl samples during Charlotte Harbor stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Farfantepenaeus duorarum	184	3.0	72.2	0.67	0.17	151.93	4.32	11	0.30	4	26
Menticirrhus americanus	114	1.8	33.3	0.43	0.18	250.65	4.99	54	5.02	13	262
Cynoscion arenarius	79	1.3	27.8	0.30	0.12	246.92	3.37	41	2.08	14	94
Callinectes sapidus	67	1.1	55.6	0.25	0.07	158.43	2.02	97	6.35	14	192
Cynoscion nebulosus	11	0.2	11.1	0.04	0.02	356.96	0.81	59	13.99	17	180
Lutjanus griseus	6	0.1	8.3	0.02	0.01	365.67	0.40	96	7.77	75	120
Archosargus probatocephalus	3	<0.1	5.6	0.01	0.01	442.07	0.27	97	16.05	66	119
Menticirrhus saxatilis	2	<0.1	2.8	0.01	0.01	600.00	0.27	14	0.00	14	14
Totals	**466**	**7.5**	**.**	**1.75**	**0.32**	**110.49**	**6.75**	**.**	**.**	**4**	**262**

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.

4.8 Northeast Florida

Northeast Florida encompasses three coastal plain estuaries, each defined by their respective lower river basins (St. Marys River, Nassau River, and St. Johns River) and interconnected via the Intracoastal Waterway (ICW; Figure 4.8). Shoreline vegetation in the lower St. Marys and Nassau rivers is characterized by an expansive saltmarsh system, while the lower St. Johns River is characterized by marshes, hardwood forests, and hardwood swamps (St. Johns River Water Management District 1993, 2000). Bottom substrates are typically characterized as mud, sand, and occasional oysters (Solomon et al. 2006). Bottom vegetation is only present in the oligohaline reaches of the St. Johns River upriver of downtown Jacksonville (Burns et al. 1997).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in northeast Florida since 2001. The area sampled was divided into six geographically-defined riverine zones (A–F; Figure 4.8). Monthly stratified-random sampling (SRS) was conducted in Zones A–D using 21.3-m river seines, 183-m haul seines, and 6.1-m river otter trawls. Monthly SRS was conducted in Zones E and F with only 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in Chapter 2. This section summarizes data collected by the FIM program during 2023 in northeast Florida.

Stratified-Random Sampling

A total of 158,537 animals, which included 173 taxa of fishes and 19 taxa of selected invertebrates, were collected from 1,356 northeast Florida SRS samples in 2023 (Table 4.58, Table A.22, Table A.23, Table A.24). *Anchoa mitchilli* (n=32,105) was the most numerous taxon collected, representing 20.3% of the total catch. *Anchoa hepsetus* (n=16,848) and *Leiostomus xanthurus* (n=16,295) were the next most abundant taxa collected, accounting for an additional 20.9% of the total catch. A total of 44 selected taxa (n=58,565 animals) composed 36.9% of the total catch. *Leiostomus xanthurus* (n=16,295) was the most abundant Selected Taxon, representing 10.3% of the total catch. *Litopenaeus setiferus* (n=15,156), *Micropogonias undulatus* (n=12,797), *Mugil cephalus* (n=3,350), and *Mugil curema* (n=2,088) were the next most abundant selected taxa, comprising 21.1% of the total catch. Collections in 2023 included 3 species new to the Northeast Florida FIM collection: *Centropomus parallelus, Ctenogobius pseudofasciatus, Labrisomus nuchipinnis*.

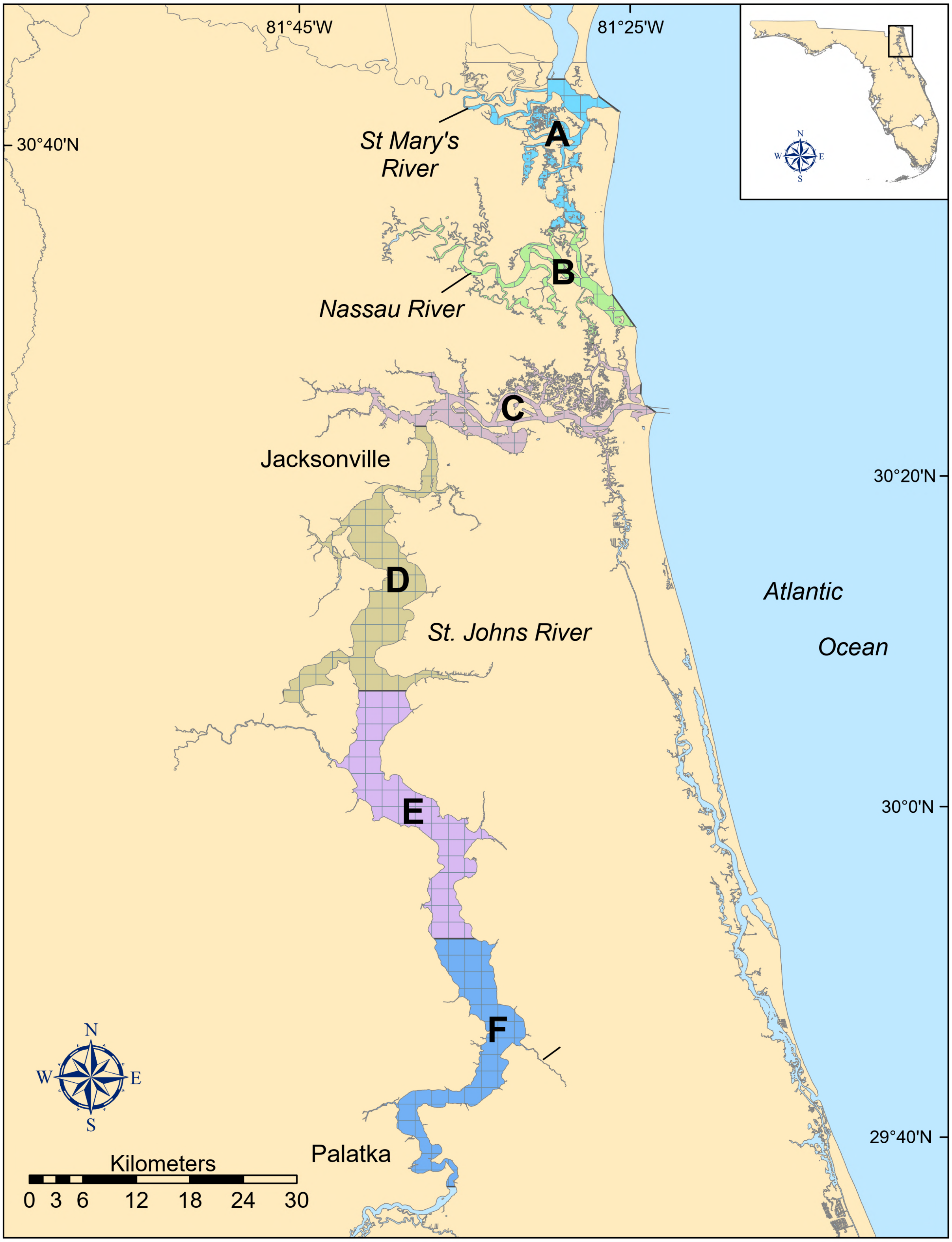

Figure 4.8: Map of northeast Florida sampling area. Zones are labeled A–F.

Table 4.58: Summary of catch and effort data for northeast Florida stratified-random sampling, 2023.

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	29,479	84	1,049	36	5,799	84	36,327	204
B	37,216	84	1,025	36	9,078	84	47,319	204
C	20,237	108	4,147	60	4,602	108	28,986	276
D	9,577	108	1,184	60	9,907	120	20,668	288
E	3,508	96	.	.	4,932	96	8,440	192
F	9,980	96	.	.	6,817	96	16,797	192
Totals	**109,997**	**576**	**7,405**	**192**	**41,135**	**588**	**158,537**	**1,356**

21.3-m River Seines

A total of 109,997 animals were collected in 576 21.3-m river seines, representing 69.4% of the overall SRS catch (Table 4.58). Anchoa mitchilli (n=23,715) was the most abundant taxon collected, accounting for 21.6% of the 21.3-m river seine catch (Table 4.59). Anchoa hepsetus (n=15,893) and Leiostomus xanthurus (n=14,788) were the next most abundant taxa, accounting for an additional 27.9% of the 21.3-m river seine catch. The taxa most frequently caught in 21.3-m river seines were *Menidia* spp. (40.5% occurrence), *Anchoa mitchilli* (35.9% occurrence), and *Menidia menidia* (29.5% occurrence).

A total of 29,129 animals from 33 selected taxa were collected, representing 26.5% of the entire 21.3-m river seine catch (Table 4.60). Leiostomus xanthurus (n=14,788), and Litopenaeus setiferus (n=8,198) were the most abundant selected taxa, accounting for 78.9% of the selected taxa collected by this gear. The selected taxa most frequently caught in 21.3-m river seines were *Litopenaeus setiferus* (27.3% occurrence) and *Callinectes sapidus* (26.4% occurrence).

Table 4.59: Catch statistics for 10 dominant taxa collected in 576 21.3-m river seine samples during northeast Florida stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	23,715	21.6	35.9	60.44	12.64	502.36	4,776.47	33	0.06	13	68
Anchoa hepsetus	15,893	14.4	22.6	40.58	12.64	747.91	5,811.76	36	0.08	15	98
Leiostomus xanthurus	14,788	13.4	25.5	37.69	24.88	1,585.41	14,211.76	24	0.09	6	155
Menidia menidia	10,975	10.0	29.5	28.02	9.89	846.94	5,270.59	44	0.11	16	90
Litopenaeus setiferus	8,198	7.5	27.3	20.93	6.68	766.50	2,916.18	11	0.05	3	29
Fundulus heteroclitus	7,457	6.8	12.2	19.04	9.02	1,136.73	4,517.65	39	0.09	15	78
Menidia spp.	5,125	4.7	40.5	13.08	1.73	317.87	682.35	35	0.13	7	67
Eucinostomus spp.	3,684	3.3	24.0	9.41	1.96	500.24	597.06	25	0.13	8	60
Poecilia latipinna	2,358	2.1	2.4	6.02	5.96	2,377.58	3,435.29	33	0.11	18	48
Opisthonema oglinum	1,866	1.7	6.2	4.76	2.11	1,064.22	1,035.29	37	0.26	26	89
Subtotals	94,059	85.5	.	.	.	.	.	.	.	3	155
Totals	**109,997**	**100.0**	**.**	**280.83**	**42.30**	**361.51**	**14,579.41**	**.**	**.**	**3**	**664**

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.

Table 4.60: Catch statistics for selected taxa collected in 576 21.3-m river seine samples during northeast Florida stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Leiostomus xanthurus	14,788	13.4	25.5	37.69	24.88	1,585.41	14,211.76	24	0.09	6	155
Litopenaeus setiferus	8,198	7.5	27.3	20.93	6.68	766.50	2,916.18	11	0.05	3	29
Mugil cephalus	1,792	1.6	14.2	4.57	2.95	1,551.84	1,676.47	32	0.79	17	404
Farfantepenaeus spp.	1,105	1.0	20.3	2.82	0.65	556.18	214.71	10	0.08	3	14
Micropogonias undulatus	841	0.8	13.9	2.15	0.54	604.14	192.65	34	0.65	8	149
Brevoortia spp.	670	0.6	1.6	1.71	1.58	2,221.90	910.29	32	0.12	19	44
Mugil curema	500	0.5	12.0	1.28	0.46	859.58	177.94	49	1.62	10	177
Callinectes sapidus	357	0.3	26.4	0.91	0.12	311.82	33.82	42	2.12	4	222
Sciaenops ocellatus	185	0.2	9.0	0.47	0.14	705.80	61.76	72	7.83	9	600
Cynoscion nebulosus	129	0.1	8.7	0.33	0.08	562.99	30.88	49	3.10	14	290
Farfantepenaeus aztecus	125	0.1	4.3	0.32	0.12	902.14	39.71	17	0.14	15	21
Menticirrhus americanus	121	0.1	3.3	0.31	0.15	1,193.03	82.35	38	1.35	16	110
Trachinotus carolinus	68	0.1	2.1	0.17	0.07	925.19	26.47	38	2.39	13	98
Elops saurus	44	<0.1	2.8	0.11	0.05	971.44	22.06	68	7.88	26	184
Centropomus undecimalis	36	<0.1	2.6	0.09	0.03	811.05	13.24	154	28.19	20	664
Paralichthys albigutta	33	<0.1	2.8	0.08	0.03	794.42	8.82	43	4.63	14	143
Lutjanus griseus	22	<0.1	3.3	0.06	0.01	589.60	4.41	90	15.56	15	210
Paralichthys lethostigma	22	<0.1	3.6	0.06	0.01	525.45	2.94	119	21.96	16	335
Caranx hippos	15	<0.1	2.3	0.04	0.01	690.82	2.94	54	7.00	28	120

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Archosargus probatocephalus	13	<0.1	2.1	0.03	0.01	708.60	2.94	195	28.09	13	365
Cynoscion complex	12	<0.1	1.4	0.03	0.01	933.55	4.41	64	18.07	22	257
Lutjanus synagris	12	<0.1	1.4	0.03	0.01	1,127.92	7.35	43	3.34	20	69
Trachinotus falcatus	9	<0.1	1.0	0.02	0.01	1,095.89	4.41	24	5.22	12	60
Menticirrhus littoralis	5	<0.1	0.3	0.01	0.01	1,978.28	5.88	45	10.41	23	78
Menticirrhus saxatilis	4	<0.1	0.7	0.01	0.01	1,196.87	1.47	49	7.37	32	68
Pogonias cromis	4	<0.1	0.7	0.01	0.01	1,196.87	1.47	131	29.52	61	205
Sphyraena barracuda	4	<0.1	0.7	0.01	0.01	1,196.87	1.47	144	54.97	75	308
Centropristis philadelphica	3	<0.1	0.3	0.01	0.01	1,787.61	2.94	93	14.95	73	122
Paralichthys dentatus	3	<0.1	0.5	0.01	<0.01	1,383.23	1.47	76	32.99	21	135
Pomatomus saltatrix	3	<0.1	0.5	0.01	<0.01	1,383.23	1.47	58	12.14	38	80
Albula spp.	2	<0.1	0.3	0.01	<0.01	1,695.58	1.47	46	5.50	40	51
Centropomus parallelus	2	<0.1	0.3	0.01	<0.01	1,695.58	1.47	57	11.00	46	68
Scomberomorus maculatus	2	<0.1	0.2	0.01	0.01	2,400.00	2.94	20	2.50	18	23
Totals	**29,129**	**26.5**	**.**	**74.37**	**26.57**	**857.50**	**14,385.29**	**.**	**.**	**3**	**664**

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.

183-m Haul Seines

A total of 7,405 animals were collected in 192 183-m haul seines, representing 4.7% of the overall SRS catch (Table 4.58). Mugil curema (n=1,588) was the most abundant taxon, accounting for 21.4% of the 183-m haul seine catch (Table 4.61). The taxa most frequently caught in 183-m haul seines were *Mugil cephalus* (70.3% occurrence), *Mugil curema* (49.0% occurrence), and *Hypanus sabinus* (38.5% occurrence).

A total of 5,705 animals from 35 selected taxa were collected, representing 77% of the entire 183-m haul seine catch (Table 4.62). Mugil curema (n=1,588) and Mugil cephalus (n=1,558) were the most abundant selected taxa, accounting for 55.1% of the selected taxa collected by this gear. The selected taxa most frequently caught in 183-m haul seines were *Mugil cephalus* (70.3% occurrence) and *Mugil curema* (49.0% occurrence).

Table 4.61: Catch statistics for 10 dominant taxa collected in 192 183-m haul seine samples during northeast Florida stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil curema	1,588	21.4	49.0	8.27	2.77	464.57	395	135	0.68	60	261
Mugil cephalus	1,558	21.0	70.3	8.11	1.21	206.22	136	199	1.37	92	408
Elops saurus	976	13.2	12.5	5.08	4.35	1,184.40	834	224	0.90	173	410
Leiostomus xanthurus	521	7.0	31.2	2.71	0.78	397.64	106	111	1.27	46	210
Lagodon rhomboides	257	3.5	24.0	1.34	0.29	305.36	28	113	1.81	43	202
Litopenaeus setiferus	252	3.4	8.9	1.31	0.97	1,021.24	184	17	0.42	10	45
Hypanus sabinus	247	3.3	38.5	1.29	0.23	243.31	31	218	3.00	58	395
Brevoortia spp.	237	3.2	7.8	1.23	0.73	821.97	127	138	2.70	75	285
Bairdiella chrysoura	134	1.8	11.5	0.70	0.23	462.55	25	117	1.46	90	170
Eucinostomus harengulus	108	1.5	17.2	0.56	0.18	434.56	26	90	0.88	55	111
Subtotals	5,878	79.3	.	.	.	.	.	.	.	10	410
Totals	**7,405**	**100.0**	**.**	**38.57**	**6.60**	**237.28**	**922**	**.**	**.**	**10**	**1,234**

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.

Table 4.62: Catch statistics for selected taxa collected in 192 183-m haul seine samples during northeast Florida stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Mugil curema	1,588	21.4	49.0	8.27	2.77	464.57	395	135	0.68	60	261
Mugil cephalus	1,558	21.0	70.3	8.11	1.21	206.22	136	199	1.37	92	408
Elops saurus	976	13.2	12.5	5.08	4.35	1,184.40	834	224	0.90	173	410
Leiostomus xanthurus	521	7.0	31.2	2.71	0.78	397.64	106	111	1.27	46	210
Litopenaeus setiferus	252	3.4	8.9	1.31	0.97	1,021.24	184	17	0.42	10	45
Brevoortia spp.	237	3.2	7.8	1.23	0.73	821.97	127	138	2.70	75	285
Sciaenops ocellatus	88	1.2	20.8	0.46	0.11	335.51	18	334	13.16	103	608
Archosargus probatocephalus	75	1.0	15.6	0.39	0.09	312.89	8	274	9.76	106	463
Caranx hippos	64	0.9	13.5	0.33	0.11	463.88	18	166	7.49	70	403
Callinectes sapidus	61	0.8	16.7	0.32	0.07	293.10	8	120	5.03	25	196
Cynoscion nebulosus	59	0.8	12.0	0.31	0.09	427.02	15	219	13.08	42	502
Micropogonias undulatus	51	0.7	10.9	0.27	0.08	417.99	11	141	5.91	70	243
Pogonias cromis	25	0.3	6.8	0.13	0.04	443.68	5	199	9.36	104	307
Paralichthys lethostigma	21	0.3	9.9	0.11	0.02	315.22	2	261	11.60	136	318
Sphyrna tiburo	20	0.3	6.2	0.10	0.04	480.84	5	826	16.95	594	907
Farfantepenaeus spp.	15	0.2	3.1	0.08	0.04	692.02	6	19	1.72	10	30
Cynoscion complex	14	0.2	1.6	0.07	0.06	1,194.84	12	285	9.75	230	362
Trachinotus falcatus	13	0.2	3.6	0.07	0.03	566.69	3	120	16.28	59	253
Menticirrhus americanus	12	0.2	3.6	0.06	0.03	667.57	5	144	13.78	71	212

Species	Number			Density Estimate (animals/set)				Standard Length (mm)			
	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Paralichthys albigutta	12	0.2	4.7	0.06	0.02	480.84	2	116	8.45	79	156
Pomatomus saltatrix	10	0.1	3.1	0.05	0.02	643.86	3	235	18.81	134	315
Lutjanus griseus	5	0.1	2.6	0.03	0.01	613.15	1	166	18.47	97	200
Scomberomorus maculatus	5	0.1	2.1	0.03	0.01	728.26	2	238	24.79	152	284
Farfantepenaeus aztecus	3	<0.1	0.5	0.02	0.02	1,385.64	3	19	0.88	18	21
Lutjanus synagris	3	<0.1	1.0	0.02	0.01	1,030.63	2	108	13.05	89	133
Megalops atlanticus	3	<0.1	1.6	0.02	0.01	795.80	1	450	170.77	263	791
Centropomus undecimalis	2	<0.1	1.0	0.01	0.01	977.23	1	432	189.00	243	621
Lobotes surinamensis	2	<0.1	0.5	0.01	0.01	1,385.64	2	329	75.00	254	404
Paralichthys dentatus	2	<0.1	1.0	0.01	0.01	977.23	1	121	49.00	72	170
Rhizoprionodon terraenovae	2	<0.1	0.5	0.01	0.01	1,385.64	2	228	4.50	223	232
Sphyraena barracuda	2	<0.1	1.0	0.01	0.01	977.23	1	293	23.00	270	316
Albula spp.	1	<0.1	0.5	0.01	0.01	1,385.64	1	150	.	150	150
Caranx crysos	1	<0.1	0.5	0.01	0.01	1,385.64	1	165	.	165	165
Carcharhinus isodon	1	<0.1	0.5	0.01	0.01	1,385.64	1	476	.	476	476
Trachinotus carolinus	1	<0.1	0.5	0.01	0.01	1,385.64	1	73	.	73	73
Totals	**5,705**	**77.0**	**.**	**29.71**	**6.24**	**290.93**	**892**	**.**	**.**	**10**	**907**

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.

6.1-m River Otter Trawls

A total of 41,135 animals were collected in 588 6.1-m river otter trawls, representing 25.9% of the overall SRS catch (Table 4.58). Micropogonias undulatus (n=11,905) was the most abundant taxon collected, accounting for 28.9% of the 6.1-m river otter trawl catch (Table 4.63). The taxa most frequently caught in 6.1-m river otter trawls were *Micropogonias undulatus* (61.2% occurrence), *Litopenaeus setiferus* (49.0% occurrence), and *Callinectes sapidus* (48.0% occurrence).

A total of 23,731 animals from 29 selected taxa were collected, representing 57.7% of the entire 6.1-m river otter trawl catch (Table 4.64). Micropogonias undulatus (n=11,905), Litopenaeus setiferus (n=6,706), and Callinectes sapidus (n=1,161) were the most abundant selected taxa, accounting for 83.3% of the selected taxa collected by this gear. The selected taxa most frequently caught in the 6.1-m river otter trawls were *Micropogonias undulatus* (61.2% occurrence) and *Litopenaeus setiferus* (49.0% occurrence).

Table 4.63: Catch statistics for 10 dominant taxa collected in 588 6.1-m river otter trawl samples during northeast Florida stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Micropogonias undulatus	11,905	28.9	61.2	2.78	0.51	442.54	237.60	30	0.22	6	183
Anchoa mitchilli	8,390	20.4	45.7	1.95	0.29	366.78	97.63	38	0.15	9	77
Litopenaeus setiferus	6,706	16.3	49.0	1.57	0.24	369.42	60.17	18	0.08	3	40
Stellifer lanceolatus	1,219	3.0	7.0	0.29	0.16	1,334.10	88.77	25	0.60	5	112
Callinectes sapidus	1,161	2.8	48.0	0.27	0.03	228.44	5.94	92	1.59	6	198
Leiostomus xanthurus	986	2.4	20.1	0.23	0.06	665.99	28.03	50	1.22	7	194
Cynoscion complex	972	2.4	32.3	0.23	0.03	321.81	7.50	45	1.09	6	211
Anchoa hepsetus	955	2.3	8.0	0.22	0.11	1,207.00	58.96	36	0.35	12	109
Farfantepenaeus spp.	842	2.0	19.0	0.20	0.04	453.59	14.30	9	0.10	3	15
Trinectes maculatus	763	1.9	27.4	0.18	0.03	432.14	14.17	57	0.72	11	134
Subtotals	33,899	82.4	.	.	.	.	.	.	.	3	211
Totals	**41,135**	**100.0**	**.**	**9.69**	**0.73**	**182.44**	**243.90**	**.**	**.**	**2**	**990**

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.

Table 4.64: Catch statistics for selected taxa collected in 588 6.1-m river otter trawl samples during northeast Florida stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Micropogonias undulatus	11,905	28.9	61.2	2.78	0.51	442.93	237.60	30	0.22	6	183
Litopenaeus setiferus	6,706	16.3	49.0	1.57	0.24	369.75	60.17	18	0.08	3	40
Callinectes sapidus	1,161	2.8	48.0	0.27	0.03	228.67	5.94	92	1.59	6	198
Leiostomus xanthurus	986	2.4	20.1	0.23	0.06	666.57	28.03	50	1.22	7	194
Cynoscion complex	972	2.4	32.3	0.23	0.03	322.11	7.50	45	1.09	6	211
Farfantepenaeus spp.	842	2.0	19.0	0.20	0.04	454.00	14.30	9	0.10	3	15
Farfantepenaeus aztecus	425	1.0	12.4	0.10	0.03	827.34	18.14	19	0.15	15	29
Elops saurus	236	0.6	7.0	0.06	0.02	902.96	11.20	36	0.33	23	48
Menticirrhus americanus	198	0.5	10.7	0.05	0.01	456.04	3.30	43	2.10	10	185
Paralichthys lethostigma	63	0.2	9.4	0.01	<0.01	332.60	0.40	189	9.48	10	341
Centropristis philadelphica	49	0.1	4.6	0.01	<0.01	561.30	0.75	85	6.36	15	187
Farfantepenaeus duorarum	33	0.1	2.9	0.01	<0.01	772.59	1.20	21	0.83	15	34
Paralichthys albigutta	26	0.1	3.4	0.01	<0.01	626.60	0.60	127	12.93	35	258
Archosargus probatocephalus	25	0.1	2.0	0.01	<0.01	916.29	0.90	202	15.15	67	382
Brevoortia spp.	18	<0.1	1.2	<0.01	<0.01	1,661.41	1.80	98	10.42	22	142
Cynoscion nebulosus	16	<0.1	2.2	<0.01	<0.01	695.48	0.27	105	16.69	13	260
Lutjanus synagris	15	<0.1	1.0	<0.01	<0.01	1,242.49	0.79	57	9.48	19	129
Centropristis striata	10	<0.1	1.2	<0.01	<0.01	967.33	0.30	92	10.81	48	162
Cynoscion nothus	9	<0.1	0.9	<0.01	<0.01	1,117.64	0.30	48	4.65	29	76

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Lutjanus griseus	7	<0.1	1.2	<0.01	<0.01	919.61	0.17	82	32.18	13	242
Sciaenops ocellatus	7	<0.1	1.0	<0.01	<0.01	1,032.28	0.27	157	59.29	9	395
Menippe spp.	6	<0.1	0.9	<0.01	<0.01	1,140.18	0.27	68	18.12	8	120
Paralichthys dentatus	5	<0.1	0.7	<0.01	<0.01	1,648.52	1.00	177	44.27	65	279
Albula spp.	4	<0.1	0.7	<0.01	<0.01	1,210.53	0.15	56	3.42	50	64
Menticirrhus saxatilis	3	<0.1	0.5	<0.01	<0.01	1,399.28	0.15	50	6.77	41	63
Caranx hippos	1	<0.1	0.2	<0.01	<0.01	2,424.87	0.12	40	.	40	40
Lutjanus analis	1	<0.1	0.2	<0.01	<0.01	2,424.87	0.11	20	.	20	20
Scomberomorus maculatus	1	<0.1	0.2	<0.01	<0.01	2,424.87	0.17	24	.	24	24
Sphyrna tiburo	1	<0.1	0.2	<0.01	<0.01	2,424.87	0.11	386	.	386	386
Totals	**23,731**	**57.7**	**.**	**5.59**	**0.59**	**256.95**	**240.45**	**.**	**.**	**3**	**395**

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.

4.9 Northern Indian River Lagoon

The sampling area identified as the northern Indian River Lagoon (IRL) system is a narrow estuary located along the eastern central coast of Florida, which extends from the northern terminus of the Indian River Lagoon proper south to Vero Beach. The northern IRL is connected to the Atlantic Ocean by one permanent inlet (Sebastian Inlet) and one intermittently open conduit via a set of locks located west of Port Canaveral. Freshwater inflow primarily comes from the St. Sebastian River and from numerous creeks located mainly along the western shoreline (Paperno and Brodie 2004). Shoreline vegetation consists largely of fringing mangrove, Brazilian pepper, and marsh grasses. Bottom substrates are typically characterized as sand or mud mixed with shell hash and occasional oysters. Seagrasses, primarily *Halodule wrightii*, have historically been the dominant vegetative cover in the northern IRL (Steward et al. 2006). However, recent losses of seagrass habitat and the subsequent replacement by the attached macroalgae *Caulerpa* have been observed (Brewton and Lapointe 2023; Adams et al. 2024).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in the northern IRL since 1990. The area sampled was divided into six geographically-defined bay zones (C–E and H) and one riverine zone that includes Turkey Creek and St. Sebastian River (F; Figure 4.9). Monthly stratified-random sampling (SRS) was conducted in Zones C, D, and H using 21.3-m bay and 183-m haul seines. Monthly SRS was conducted in Zone E with only 183-m haul seines. Zone F was sampled in every month except March, May, and July with 21.3-m river seines. All methods were the same as those described in Chapter 2. This section summarizes data collected by the FIM program during 2023 in the northern IRL.

Stratified-Random Sampling

A total of 249,917 animals, which included 168 taxa of fishes and 13 taxa of selected invertebrates, were collected from 654 northern Indian River Lagoon SRS samples in 2023 (Table 4.65, Table A.25, Table A.26, Table A.27). *Anchoa mitchilli* (n=163,498) was the most numerous taxon collected, representing 65.4% of the total catch. *Eucinostomus* spp. (n=14,072) and *Anchoa lyolepis* (n=8,579) were the next most abundant taxa collected, accounting for an additional 9.1% of the total catch. A total of 43 selected taxa (n=18,054 animals) composed 7.2% of the total catch. *Mugil curema* (n=4,022) was the most abundant Selected Taxon, representing 1.6% of the total catch. *Brevoortia* spp. (n=3,585), *Mugil cephalus* (n=2,018), *Micropogonias undulatus* (n=1,326), and *Menticirrhus americanus* (n=1,039) were the next most abundant selected taxa, comprising 3.2% of the total catch. Collections in 2023 included 3 species new to the northern Indian River Lagoon FIM collection: *Atherinomorus stipes, Caranx ruber, Lupinoblennius vinctus*.

Figure 4.9: Map of the northern Indian River Lagoon sampling area. Zones are labeled C–E (bay zones), F (river zone), and H (bay zone).

Table 4.65: Summary of catch and effort data for northern Indian River Lagoon stratified-random sampling, 2023.

Zone	21.3-m bay seine		21.3-m river seine		183-m haul seine		Totals	
	Animals	Hauls	Animals	Hauls	Animals	Hauls	Animals	Hauls
C	34,332	120	.	.	6,746	48	41,078	168
D	12,448	96	.	.	5,366	72	17,814	168
E	.	.	.	.	4,443	48	4,443	48
F	.	.	40,499	90	.	.	40,499	90
H	137,071	120	.	.	9,012	60	146,083	180
Totals	**183,851**	**336**	**40,499**	**90**	**25,567**	**228**	**249,917**	**654**

Bay Sampling

21.3-m Bay Seines

A total of 183,851 animals were collected in 336 21.3-m bay seines, representing 73.6% of the overall SRS catch (Table 4.65). Anchoa mitchilli (n=139,388) and Anchoa lyolepis (n=8,579) were the most abundant taxa, accounting for 80.5% of the bay seine catch (Table 4.66). The taxa most frequently caught in 21.3-m bay seines were *Anchoa mitchilli* (46.7% occurrence) and *Eucinostomus* spp. (42.6% occurrence).

A total of 4,616 animals from 28 selected taxa were collected, representing 2.5% of the entire 21.3-m bay seine catch (Table 4.67). Mugil cephalus (n=899) was the most abundant Selected Taxon, accounting for 19.5% of the selected taxa collected by this gear. The selected taxa most frequently caught in 21.3-m bay seines were *Farfantepenaeus* spp. (23.8% occurrence) and *Mugil curema* (16.7% occurrence).

Table 4.66: Catch statistics for 10 dominant taxa collected in 336 21.3-m bay seine samples during northern Indian River Lagoon stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	139,388	75.8	46.7	289.43	178.92	1,146.54	60,891.43	40	0.02	17	62
Anchoa lyolepis	8,579	4.7	0.9	18.24	18.23	1,832.39	6,125.71	51	0.03	34	57
Eucinostomus spp.	8,037	4.4	42.6	16.98	4.41	477.02	1,048.57	25	0.08	10	39
Harengula jaguana	6,706	3.6	8.9	14.05	4.34	570.67	858.57	50	0.14	20	102
Microgobius gulosus	1,907	1.0	42.0	4.05	0.67	301.50	114.29	28	0.14	11	56
Menidia spp.	1,720	0.9	24.7	3.61	0.69	354.57	132.86	40	0.26	18	82
Opisthonema oglinum	1,686	0.9	9.2	3.56	1.41	727.05	297.14	42	0.26	23	68
Bairdiella chrysoura	1,441	0.8	22.9	2.97	0.61	386.02	131.43	41	0.72	8	140
Diapterus auratus	1,077	0.6	21.7	2.26	0.83	682.02	202.86	38	0.53	11	147
Lucania parva	912	0.5	16.4	1.93	0.60	574.99	137.86	23	0.17	8	44
Subtotals	171,453	93.2	.	.	.	.	.	.	.	8	147
Totals	**183,846**	**100.0**	**.**	**390.84**	**204.45**	**958.86**	**68,138.57**	**.**	**.**	**2**	**794**

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.

Table 4.67: Catch statistics for selected taxa collected in 336 21.3-m bay seine samples during northern Indian River Lagoon stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil cephalus	899	0.5	10.1	1.91	1.08	1,036.79	307.86	26	0.97	15	399
Farfantepenaeus spp.	780	0.4	23.8	1.66	0.41	457.90	114.29	8	0.11	2	15
Brevoortia spp.	569	0.3	13.1	1.20	0.33	505.75	71.43	30	0.33	19	73
Micropogonias undulatus	551	0.3	9.8	1.17	0.91	1,425.69	305.00	33	0.34	11	112
Mugil curema	397	0.2	16.7	0.84	0.46	1,006.97	153.57	90	2.10	16	251
Cynoscion nebulosus	279	0.2	16.4	0.59	0.15	466.16	41.43	34	1.57	14	260
Callinectes sapidus	205	0.1	14.3	0.44	0.22	919.88	69.29	29	2.15	4	154
Sciaenops ocellatus	169	0.1	14.0	0.36	0.09	465.44	22.86	48	4.90	12	498
Menticirrhus americanus	129	0.1	6.8	0.27	0.11	751.06	21.43	38	1.65	15	111
Leiostomus xanthurus	118	0.1	3.3	0.25	0.13	976.84	40.71	33	1.55	11	87
Archosargus probatocephalus	115	0.1	8.6	0.24	0.07	505.72	12.14	55	4.30	11	231
Mugil trichodon	79	<0.1	0.6	0.17	0.17	1,809.91	55.71	17	0.17	13	19
Elops saurus	64	<0.1	2.7	0.14	0.11	1,521.54	37.86	59	2.54	26	147
Litopenaeus setiferus	55	<0.1	4.8	0.12	0.05	841.75	15.00	6	0.31	3	15
Trachinotus falcatus	49	<0.1	3.0	0.10	0.05	883.29	13.57	53	4.40	15	168
Lutjanus griseus	35	<0.1	3.6	0.07	0.04	1,008.02	12.86	46	8.01	16	187
Farfantepenaeus aztecus	34	<0.1	4.2	0.07	0.02	582.92	4.29	17	0.31	15	23
Farfantepenaeus duorarum	19	<0.1	3.0	0.04	0.02	852.91	5.71	17	0.50	15	21
Pogonias cromis	17	<0.1	1.2	0.04	0.03	1,331.95	8.57	132	37.25	30	402

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Albula spp.	16	<0.1	1.8	0.03	0.02	1,095.94	6.43	41	6.53	25	134
Cynoscion complex	8	<0.1	1.5	0.02	0.01	912.40	2.14	36	6.11	18	63
Caranx hippos	7	<0.1	2.1	0.01	0.01	686.59	0.71	69	20.98	28	187
Centropomus undecimalis	7	<0.1	1.5	0.01	0.01	864.01	1.43	288	119.92	18	794
Trachinotus carolinus	7	<0.1	1.2	0.01	0.01	1,138.73	2.86	30	5.52	18	58
Paralichthys albigutta	3	<0.1	0.9	0.01	<0.01	1,055.14	0.71	54	28.67	24	111
Haemulon parra	2	<0.1	0.3	<0.01	<0.01	1,833.03	1.43	26	3.00	23	29
Sphyraena barracuda	2	<0.1	0.6	<0.01	<0.01	1,294.21	0.71	178	7.00	171	185
Mugil rubrioculus	1	<0.1	0.3	<0.01	<0.01	1,833.03	0.71	60	.	60	60
Totals	**4,616**	**2.5**	**.**	**9.81**	**1.99**	**371.52**	**501.43**	**.**	**.**	**2**	**794**

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.

183-m Haul Seines

A total of 25,567 animals were collected in 228 183-m haul seines, representing 10.2% of the overall SRS catch (Table 4.65). Eucinostomus harengulus (n=4,080) was the most abundant taxon, accounting for 16% of the 183-m haul seine catch (Table 4.68). The taxa most frequently caught in 183-m haul seines were *Mugil curema* (87.7% occurrence), *Mugil cephalus* (67.5% occurrence), and *Hypanus sabinus* (66.2% occurrence).

A total of 9,620 animals from 39 selected taxa were collected, representing 37.6% of the entire 183-m haul seine catch (Table 4.69). Mugil curema (n=3,550) and Brevoortia spp. (n=1,181) were the most abundant selected taxa, accounting for 49.2% of the selected taxa collected by this gear. The selected taxa most frequently caught in 183-m haul seines were *Mugil curema* (87.7% occurrence) and *Mugil cephalus* (67.5% occurrence).

Table 4.68: Catch statistics for 10 dominant taxa collected in 228 183-m haul seine samples during northern Indian River Lagoon stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Eucinostomus harengulus	4,080	16.0	50.0	17.89	4.01	338.77	644	105	0.17	42	152
Mugil curema	3,550	13.9	87.7	15.50	1.69	164.84	240	149	0.51	90	287
Diapterus auratus	2,583	10.1	43.4	11.33	2.13	284.51	246	120	0.54	55	235
Bairdiella chrysoura	2,305	9.0	25.0	10.11	2.59	387.03	262	113	0.18	82	154
Ariopsis felis	1,773	6.9	55.3	7.78	1.45	281.62	268	261	0.83	123	421
Brevoortia spp.	1,181	4.6	7.9	5.18	3.04	886.06	579	116	0.76	60	240
Mugil cephalus	1,024	4.0	67.5	4.49	0.47	158.84	53	237	1.52	108	396
Lagodon rhomboides	1,035	4.0	20.2	4.46	1.56	531.46	243	111	0.81	42	214
Menticirrhus americanus	909	3.6	8.3	3.99	2.85	1,078.61	621	153	0.52	105	267
Hypanus sabinus	721	2.8	66.2	3.16	0.30	145.37	35	242	1.26	100	432
Subtotals	19,161	74.9	.	.	.	.	.	.	.	42	432
Totals	**25,562**	**100.0**	**.**	**112.14**	**10.31**	**138.89**	**1,418**	**.**	**.**	**9**	**1,180**

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.

Table 4.69: Catch statistics for selected taxa collected in 228 183-m haul seine samples during northern Indian River Lagoon stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil curema	3,550	13.9	87.7	15.50	1.69	164.84	240	149	0.51	90	287
Brevoortia spp.	1,181	4.6	7.9	5.18	3.04	886.06	579	116	0.76	60	240
Mugil cephalus	1,024	4.0	67.5	4.49	0.47	158.84	53	237	1.52	108	396
Menticirrhus americanus	909	3.6	8.3	3.99	2.85	1,078.61	621	153	0.52	105	267
Trachinotus falcatus	406	1.6	4.8	1.78	1.60	1,355.86	364	182	1.63	52	365
Pogonias cromis	384	1.5	24.6	1.68	0.49	443.57	93	396	6.73	129	897
Centropomus undecimalis	304	1.2	30.3	1.33	0.24	276.56	31	478	10.76	143	879
Elops saurus	304	1.2	35.5	1.33	0.25	279.24	37	269	3.32	124	485
Caranx hippos	284	1.1	20.6	1.25	0.77	938.94	176	376	8.05	72	521
Archosargus probatocephalus	238	0.9	33.8	1.02	0.18	263.98	28	196	5.00	40	374
Callinectes sapidus	218	0.9	20.6	0.96	0.25	393.88	40	114	2.90	27	193
Sciaenops ocellatus	216	0.8	39.5	0.95	0.11	171.23	8	337	10.94	110	913
Micropogonias undulatus	94	0.4	3.9	0.41	0.23	824.23	37	128	4.90	96	333
Leiostomus xanthurus	82	0.3	6.1	0.36	0.25	1,058.94	57	123	2.72	81	252
Lutjanus griseus	76	0.3	8.3	0.33	0.11	487.19	17	157	4.87	20	255
Cynoscion complex	71	0.3	0.4	0.31	0.31	1,509.97	71	168	2.19	124	214
Haemulon parra	71	0.3	0.4	0.31	0.31	1,509.97	71	165	2.32	108	215
Cynoscion nebulosus	45	0.2	12.3	0.20	0.04	329.70	6	233	16.86	98	544
Mugil rubrioculus	44	0.2	4.8	0.19	0.13	978.54	28	136	3.97	105	257

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Trachinotus carolinus	25	0.1	1.3	0.11	0.09	1,278.72	21	301	7.81	237	405
Lutjanus analis	18	0.1	3.9	0.08	0.03	561.32	4	146	8.45	99	208
Sphyraena barracuda	17	0.1	4.4	0.07	0.03	532.11	3	259	13.64	182	388
Farfantepenaeus spp.	11	<0.1	1.3	0.05	0.03	957.77	6	19	2.08	9	27
Farfantepenaeus aztecus	9	<0.1	3.1	0.04	0.02	597.91	2	21	2.15	15	34
Lutjanus synagris	9	<0.1	0.9	0.04	0.04	1,351.90	8	131	1.71	122	136
Megalops atlanticus	8	<0.1	2.2	0.04	0.02	749.98	3	678	83.64	430	1,180
Farfantepenaeus duorarum	6	<0.1	1.8	0.03	0.02	867.93	3	24	1.61	20	31
Litopenaeus setiferus	2	<0.1	0.9	0.01	0.01	1,065.35	1	26	3.00	23	29
Lobotes surinamensis	2	<0.1	0.4	0.01	0.01	1,509.97	2	270	12.50	257	282
Pomatomus saltatrix	2	<0.1	0.9	0.01	0.01	1,065.35	1	368	35.00	333	403
Scomberomorus maculatus	2	<0.1	0.4	0.01	0.01	1,509.97	2	216	58.00	158	274
Albula spp.	1	<0.1	0.4	<0.01	<0.01	1,509.97	1	238	.	238	238
Calamus penna	1	<0.1	0.4	<0.01	<0.01	1,509.97	1	110	.	110	110
Caranx crysos	1	<0.1	0.4	<0.01	<0.01	1,509.97	1	164	.	164	164
Menippe spp.	1	<0.1	0.4	<0.01	<0.01	1,509.97	1	23	.	23	23
Mycteroperca microlepis	1	<0.1	0.4	<0.01	<0.01	1,509.97	1	111	.	111	111
Ocyurus chrysurus	1	<0.1	0.4	<0.01	<0.01	1,509.97	1	164	.	164	164
Paralichthys albigutta	1	<0.1	0.4	<0.01	<0.01	1,509.97	1	237	.	237	237
Paralichthys lethostigma	1	<0.1	0.4	<0.01	<0.01	1,509.97	1	343	.	343	343
Totals	**9,620**	**37.6**	**.**	**42.19**	**6.65**	**238.07**	**1,170**	**.**	**.**	**9**	**1,180**

Species	Number			Density Estimate (animals/set)				Standard Length (mm)			
	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max

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.

River Sampling

21.3-m River Seines

A total of 40,499 animals were collected in 90 21.3-m river seines, representing 16.2% of the overall SRS catch (Table 4.65). Anchoa mitchilli (n=24,110) was the most abundant taxon collected, accounting for 59.5% of the 21.3-m river seine catch (Table 4.70). Eucinostomus spp. (n=6,035) and Diapterus auratus (n=3,049) were the next most abundant taxa, accounting for an additional 22.4% of the 21.3-m river seine catch. The taxa most frequently caught in 21.3-m river seines were *Eucinostomus* spp. (80.0% occurrence), *Diapterus auratus* (74.4% occurrence), and *Centropomus undecimalis* (61.1% occurrence).

A total of 3,818 animals from 20 selected taxa were collected, representing 9.4% of the entire 21.3-m river seine catch (Table 4.71). Brevoortia spp. (n=1,835), and Micropogonias undulatus (n=681) were the most abundant selected taxa, accounting for 65.9% of the selected taxa collected by this gear. The selected taxa most frequently caught in 21.3-m river seines were *Centropomus undecimalis* (61.1% occurrence) and *Callinectes sapidus* (37.8% occurrence).

Table 4.70: Catch statistics for 10 dominant taxa collected in 90 21.3-m river seine samples during northern Indian River Lagoon stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	24,110	59.5	28.9	385.39	295.30	734.94	27,105.88	38	0.04	14	53
Eucinostomus spp.	6,035	14.9	80.0	93.42	27.51	287.04	2,170.59	23	0.08	11	39
Diapterus auratus	3,049	7.5	74.4	42.30	8.93	217.24	598.53	33	0.31	12	162
Brevoortia spp.	1,835	4.5	14.4	28.71	21.10	712.69	1,963.24	22	0.10	17	63
Micropogonias undulatus	681	1.7	7.8	11.13	10.96	934.62	986.76	22	0.12	15	57
Gambusia holbrooki	618	1.5	35.6	10.10	3.18	298.53	186.76	24	0.21	13	38
Menidia spp.	542	1.3	36.7	8.86	4.01	429.63	332.35	35	0.33	16	52
Eugerres plumieri	485	1.2	51.1	7.59	2.13	272.43	126.47	51	1.73	14	230
Eucinostomus harengulus	458	1.1	53.3	7.48	1.52	192.21	77.94	51	0.42	40	83
Centropomus undecimalis	467	1.2	61.1	7.08	1.59	221.03	114.71	43	1.73	10	320
Subtotals	38,280	94.4	.	.	.	.	.	.	.	10	320
Totals	**40,496**	**100.0**	**.**	**661.75**	**309.22**	**443.29**	**27,676.47**	**.**	**.**	**2**	**477**

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.

Table 4.71: Catch statistics for selected taxa collected in 90 21.3-m river seine samples during northern Indian River Lagoon stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Brevoortia spp.	1,835	4.5	14.4	28.71	21.10	712.69	1,963.24	22	0.10	17	63
Micropogonias undulatus	681	1.7	7.8	11.13	10.96	934.62	986.76	22	0.12	15	57
Centropomus undecimalis	467	1.2	61.1	7.08	1.59	221.03	114.71	43	1.73	10	320
Leiostomus xanthurus	254	0.6	4.4	4.15	3.47	792.18	305.88	18	0.20	10	36
Callinectes sapidus	146	0.4	37.8	2.39	0.76	302.21	54.41	26	3.09	5	210
Farfantepenaeus spp.	127	0.3	32.2	2.08	0.47	216.65	20.59	6	0.26	2	13
Mugil cephalus	95	0.2	3.3	1.54	1.36	846.34	123.53	21	0.26	17	27
Mugil curema	75	0.2	5.6	1.20	0.64	508.52	42.65	41	3.55	17	170
Sciaenops ocellatus	29	0.1	10.0	0.47	0.22	445.81	17.65	32	5.51	15	184
Lutjanus griseus	26	0.1	15.6	0.42	0.16	364.14	13.24	126	10.46	38	307
Archosargus probatocephalus	25	0.1	16.7	0.41	0.11	264.53	5.88	69	10.33	14	169
Elops saurus	20	<0.1	4.4	0.33	0.26	765.51	23.53	53	3.09	24	77
Litopenaeus setiferus	13	<0.1	10.0	0.21	0.08	352.87	4.41	6	0.54	3	9
Centropomus ensiferus	11	<0.1	1.1	0.18	0.18	948.68	16.18	35	1.91	29	47
Centropomus pectinatus	6	<0.1	1.1	0.10	0.10	948.68	8.82	16	0.82	13	19
Trachinotus falcatus	4	<0.1	1.1	0.07	0.07	948.68	5.88	15	2.10	11	21
Caranx hippos	1	<0.1	1.1	0.02	0.02	948.68	1.47	31	.	31	31
Centropomus parallelus	1	<0.1	1.1	0.02	0.02	948.68	1.47	25	.	25	25
Menticirrhus americanus	1	<0.1	1.1	0.02	0.02	948.68	1.47	22	.	22	22

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Sphyraena barracuda	1	<0.1	1.1	0.02	0.02	948.68	1.47	155	.	155	155
Totals	**3,818**	**9.4**	**.**	**62.39**	**25.26**	**384.17**	**1,972.06**	**.**	**.**	**2**	**320**

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.

4.10 Southern Indian River Lagoon

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

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in the southern IRL using 183-m haul seines since 1997. Monthly stratified-random sampling (SRS) has been focused in two geographically-defined bay zones (I and J) and one riverine zone (T; Figure 4.10). Beginning in 2016, in an effort to expand the collection of juvenile fish data in the region, monthly sampling with 21.3-m seines was initiated in the Loxahatchee and St. Lucie rivers (Zones L and T; Figure 4.10). As a result, the 21.3-m seine sampling universe in Zone T was expanded to include the upstream and backwater areas of the St. Lucie River that were not previously accessible with the 183-m haul seines.

Loxahatchee River (Zone L; Figure 4.10) was also added to the 21.3-m seine sampling universe in 2016. The Loxahatchee River covers an ecosystem of approximately 673 km^2 in Martin and Palm Beach counties and is one of only two river systems in Florida designated as a “Wild and Scenic River.” The Loxahatchee River includes the North Fork, Northwest Fork, and the Southwest Fork, all of which drain into the Atlantic Ocean through Jupiter Inlet at the terminus of the Southern Indian River Lagoon. Shoreline slopes can be steep along much of the sampling area with many shorelines closer to urbanization characterized by man-made habitats including seawalls, rip-rap, and docks. Much of the sampling area is brackish with shoreline vegetation consisting of a mixture of salt-tolerant overhanging trees and shrubs while upstream habitats include freshwater marsh vegetation (swamp lily, lily pads, leather fern, etc.). Upriver and backwater areas typically have a mud/detritus substrate while the mainstem and areas closer to the Indian River Lagoon are comprised of mainly sand/shell hash due to stronger water flow. Submerged aquatic vegetation is minimal, but can include tapegrass (*Vallisneria* spp.) in low salinity habitats and shoal grass (*Halodule* spp.) in higher salinity habitats closer to the mouth of the river.

All methods were the same as those described in Chapter 2. This section summarizes data collected by the FIM program during 2023 in southern Indian River Lagoon.

Stratified-Random Sampling

A total of 57,021 animals, which included 155 taxa of fishes and 10 taxa of selected invertebrates, were collected from 351 southern Indian River Lagoon SRS samples in 2023 (Table 4.72, Table A.28, Table A.29, Table A.30). *Anchoa mitchilli* (n=19,986) was the most numerous taxon collected, representing 35.1% of the total catch. *Diapterus auratus* (n=5,849) and *Lagodon rhomboides* (n=5,699) were the next most abundant taxa collected, accounting for an additional 20.3% of the total catch. A total of 47 selected taxa (n=6,306 animals) comprised 11.1% of the total catch. *Mugil curema* (n=1,747) was the most abundant Selected Taxon, representing 3.1% of the

Figure 4.10: Map of Southern Indian River Lagoon sampling area, separated into four geographic zones: I, J, L, and T.

total catch. *Brevoortia* spp. (n=642), *Mugil cephalus* (n=569), *Farfantepenaeus* spp. (n=541), and *Elops saurus* (n=478) were the next most abundant selected taxa, comprising 3.9% of the total catch. Collections in 2023 included 2 species new to the southern Indian River Lagoon FIM collection: *Brachygenys chrysargyreum, Gymnothorax funebris*.

Table 4.72: Summary of catch and effort data for southern Indian River Lagoon stratified-random sampling, 2023.

Zone	21.3-m river seine		183-m haul seine		Totals	
	Animals	Hauls	Animals	Hauls	Animals	Hauls
I	.	.	15,905	48	15,905	48
J	.	.	4,107	48	4,107	48
L	10,006	45	.	.	10,006	45
T	25,233	162	1,770	48	27,003	210
Totals	**35,239**	**207**	**21,782**	**144**	**57,021**	**351**

Bay Sampling

183-m Haul Seines

A total of 21,782 animals were collected in 144 183-m haul seines, representing 38.2% of the overall SRS catch (Table 4.72). Lagodon rhomboides (n=5,674) was the most abundant taxon, accounting for 26.1% of the 183-m haul seine catch (Table 4.73). The taxa most frequently caught in 183-m haul seines were *Diapterus auratus* (65.3% occurrence), *Ariopsis felis* (61.8% occurrence), and *Mugil curema* (59.7% occurrence).

A total of 3,559 animals from 36 selected taxa were collected, representing 16.3% of the entire 183-m haul seine catch (Table 4.74). Mugil curema (n=1,230) and Elops saurus (n=466) were the most abundant selected taxa, accounting for 47.7% of the selected taxa collected by this gear. The selected taxa most frequently caught in 183-m haul seines were *Mugil curema* (59.7% occurrence) and *Archosargus probatocephalus* (52.8% occurrence).

Table 4.73: Catch statistics for 10 dominant taxa collected in 144 183-m haul seine samples during southern Indian River Lagoon stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	5,674	26.0	20.8	38.60	32.27	1,013.50	4,730	94	0.15	61	194
Diapterus auratus	4,300	19.7	65.3	29.86	5.64	226.75	384	151	0.47	43	345
Harengula jaguana	3,248	14.9	9.7	22.56	19.27	1,024.99	2,765	101	0.09	60	131
Eucinostomus gula	1,270	5.8	19.4	8.82	4.49	610.79	553	86	0.25	49	111
Opisthonema oglinum	1,233	5.7	4.9	8.56	8.19	1,148.43	1,180	154	0.42	70	180
Mugil curema	1,230	5.6	59.7	8.54	1.89	265.50	179	185	0.87	74	352
Ariopsis felis	566	2.6	61.8	3.93	0.58	175.72	46	237	1.57	85	366
Elops saurus	466	2.1	25.7	3.24	1.74	643.47	243	352	3.50	153	525
Sphoeroides testudineus	347	1.6	47.2	2.41	0.41	203.09	26	128	2.03	53	241
Archosargus probatocephalus	300	1.4	52.8	2.08	0.39	226.82	41	273	2.76	72	432
Subtotals	18,634	85.4	.	.	.	.	.	.	.	43	525
Totals	**21,769**	**99.9**	**.**	**151.26**	**40.64**	**322.44**	**4,773**	**.**	**.**	**35**	**1,350**

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.

Table 4.74: Catch statistics for selected taxa collected in 144 183-m haul seine samples during southern Indian River Lagoon stratified-random sampling, 2023.

	Number			Density Estimate (animals/set)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Mugil curema	1,230	5.6	59.7	8.54	1.89	265.50	179	185	0.87	74	352
Elops saurus	466	2.1	25.7	3.24	1.74	643.47	243	352	3.50	153	525
Archosargus probatocephalus	300	1.4	52.8	2.08	0.39	226.82	41	273	2.76	72	432
Mugil cephalus	264	1.2	41.0	1.83	0.42	272.54	47	251	3.77	124	459
Sphyraena barracuda	263	1.2	36.8	1.83	0.44	289.02	51	356	7.58	103	730
Micropogonias undulatus	234	1.1	16.7	1.62	0.65	480.43	84	199	4.71	103	340
Centropomus undecimalis	197	0.9	45.8	1.37	0.25	215.90	24	449	10.70	144	950
Caranx hippos	117	0.5	31.2	0.81	0.14	209.40	10	212	15.08	74	925
Lutjanus analis	93	0.4	20.1	0.65	0.17	315.29	17	153	5.21	82	282
Pogonias cromis	79	0.4	10.4	0.55	0.35	758.12	49	252	4.68	176	409
Trachinotus carolinus	51	0.2	4.2	0.35	0.32	1,082.77	46	319	5.84	245	409
Callinectes sapidus	48	0.2	13.2	0.33	0.09	330.92	8	121	5.27	55	180
Brevoortia spp.	45	0.2	3.5	0.31	0.18	698.29	23	130	3.33	87	173
Trachinotus falcatus	37	0.2	8.3	0.26	0.13	588.97	17	164	7.06	58	277
Lutjanus griseus	28	0.1	10.4	0.19	0.06	361.25	6	167	8.80	95	255
Albula spp.	22	0.1	4.9	0.15	0.09	739.72	13	268	14.40	146	350
Lutjanus synagris	21	0.1	5.6	0.15	0.06	465.63	5	104	3.47	80	131
Caranx crysos	13	0.1	4.2	0.09	0.04	522.57	3	196	7.40	144	233
Menticirrhus americanus	12	0.1	1.4	0.08	0.07	1,018.43	10	178	6.36	133	216

Species	Number		% Occur	Density Estimate (animals/set)				Standard Length (mm)			
	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Pomatomus saltatrix	11	0.1	4.2	0.08	0.04	620.81	5	395	15.97	296	482
Scomberomorus maculatus	3	<0.1	2.1	0.02	0.01	687.96	1	380	31.94	344	444
Sphyrna tiburo	3	<0.1	0.7	0.02	0.02	1,200.00	3	646	92.93	541	831
Carcharhinus leucas	2	<0.1	1.4	0.01	0.01	845.56	1	655	70.00	585	725
Centropomus parallelus	2	<0.1	1.4	0.01	0.01	845.56	1	342	52.00	290	394
Cynoscion complex	2	<0.1	1.4	0.01	0.01	845.56	1	238	16.50	222	255
Leiostomus xanthurus	2	<0.1	1.4	0.01	0.01	845.56	1	140	37.50	102	177
Megalops atlanticus	2	<0.1	1.4	0.01	0.01	845.56	1	698	62.50	635	760
Mugil rubrioculus	2	<0.1	1.4	0.01	0.01	845.56	1	201	5.00	196	206
Paralichthys albigutta	2	<0.1	0.7	0.01	0.01	1,200.00	2	174	5.50	169	180
Sciaenops ocellatus	2	<0.1	1.4	0.01	0.01	845.56	1	356	48.50	307	404
Cynoscion nebulosus	1	<0.1	0.7	0.01	0.01	1,200.00	1	308	.	308	308
Haemulon parra	1	<0.1	0.7	0.01	0.01	1,200.00	1	82	.	82	82
Haemulon sciurus	1	<0.1	0.7	0.01	0.01	1,200.00	1	81	.	81	81
Lachnolaimus maximus	1	<0.1	0.7	0.01	0.01	1,200.00	1	180	.	180	180
Lobotes surinamensis	1	<0.1	0.7	0.01	0.01	1,200.00	1	203	.	203	203
Menippe spp.	1	<0.1	0.7	0.01	0.01	1,200.00	1	100	.	100	100
Totals	**3,559**	**16.3**	**.**	**24.72**	**3.13**	**152.14**	**266**	**.**	**.**	**55**	**950**

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.

River Sampling

21.3-m River Seines

A total of 35,239 animals were collected in 207 21.3-m river seines, representing 61.8% of the overall SRS catch (Table 4.72). Anchoa mitchilli (n=19,986) was the most abundant taxon collected, accounting for 56.7% of the 21.3-m river seine catch (Table 4.75). Eucinostomus spp. (n=3,723) and Menidia spp. (n=2,087) were the next most abundant taxa, accounting for an additional 16.5% of the 21.3-m river seine catch. The taxa most frequently caught in 21.3-m river seines were *Eucinostomus* spp. (72.5% occurrence), *Diapterus auratus* (48.8% occurrence), and *Eucinostomus harengulus* (47.8% occurrence).

A total of 2,747 animals from 35 selected taxa were collected, representing 7.8% of the entire 21.3-m river seine catch (Table 4.76). Brevoortia spp. (n=597), and Farfantepenaeus spp. (n=541) were the most abundant selected taxa, accounting for 41.4% of the selected taxa collected by this gear. The selected taxa most frequently caught in 21.3-m river seines were *Farfantepenaeus* spp. (47.8% occurrence) and *Centropomus undecimalis* (38.2% occurrence).

Table 4.75: Catch statistics for 10 dominant taxa collected in 207 21.3-m river seine samples during southern Indian River Lagoon stratified-random sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Anchoa mitchilli	19,986	56.7	24.6	139.29	59.75	623.08	8,964.71	39	0.05	17	61
Eucinostomus spp.	3,723	10.6	72.5	26.20	5.42	298.91	892.65	25	0.12	8	39
Menidia spp.	2,087	5.9	41.5	14.83	9.81	951.66	2,027.94	35	0.16	11	58
Diapterus auratus	1,549	4.4	48.8	10.80	2.40	322.70	345.59	30	0.55	10	251
Eucinostomus harengulus	740	2.1	47.8	5.23	1.45	400.32	282.35	55	0.34	40	93
Brevoortia spp.	597	1.7	9.7	4.14	1.94	682.07	322.06	30	0.32	15	49
Farfantepenaeus spp.	541	1.5	47.8	3.84	0.53	199.16	47.06	5	0.10	1	18
Mugil curema	517	1.5	12.1	3.67	2.49	976.53	505.88	29	1.04	13	216
Eugerres plumieri	509	1.4	35.3	3.58	0.99	400.65	161.76	58	2.16	14	263
Gambusia holbrooki	440	1.2	15.5	3.13	1.05	481.84	160.29	24	0.25	12	36
Subtotals	30,689	87.0	.	.	.	.	.	.	.	1	263
Totals	**35,219**	**99.9**	**.**	**250.35**	**65.53**	**376.59**	**9,086.76**	**.**	**.**	**1**	**784**

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.

Table 4.76: Catch statistics for selected taxa collected in 207 21.3-m river seine samples during southern Indian River Lagoon stratified-random sampling, 2023.

Species	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Brevoortia spp.	597	1.7	9.7	4.14	1.94	682.07	322.06	30	0.32	15	49
Farfantepenaeus spp.	541	1.5	47.8	3.84	0.53	199.16	47.06	5	0.10	1	18
Mugil curema	517	1.5	12.1	3.67	2.49	976.53	505.88	29	1.04	13	216
Mugil cephalus	305	0.9	9.2	2.16	1.63	1,087.43	335.29	40	3.16	16	342
Callinectes sapidus	249	0.7	37.7	1.77	0.27	218.68	35.29	15	1.27	3	154
Centropomus undecimalis	227	0.6	38.2	1.47	0.17	177.49	19.12	85	5.87	8	544
Litopenaeus setiferus	64	0.2	8.2	0.45	0.27	843.24	52.94	6	0.34	2	16
Micropogonias undulatus	42	0.1	11.6	0.30	0.07	356.00	8.82	23	1.37	8	42
Archosargus probatocephalus	37	0.1	13.5	0.26	0.05	292.70	5.88	111	16.41	11	307
Lutjanus griseus	33	0.1	9.2	0.23	0.08	491.30	14.71	105	13.22	12	253
Sphyraena barracuda	32	0.1	6.8	0.23	0.08	504.00	11.76	93	12.53	24	267
Mugil rubrioculus	25	0.1	4.3	0.18	0.09	765.30	17.65	60	8.24	18	208
Elops saurus	12	<0.1	4.3	0.09	0.03	580.19	5.88	45	10.81	22	163
Haemulon parra	11	<0.1	1.0	0.08	0.07	1,204.63	13.24	83	4.39	53	106
Lutjanus synagris	9	<0.1	1.9	0.06	0.04	995.72	8.82	52	7.49	29	104
Leiostomus xanthurus	6	<0.1	1.9	0.04	0.02	826.62	4.41	23	2.08	15	29
Sciaenops ocellatus	6	<0.1	2.9	0.04	0.02	580.19	1.47	29	8.39	15	69
Centropomus parallelus	5	<0.1	1.9	0.04	0.02	756.55	2.94	228	39.20	78	305
Caranx hippos	4	<0.1	1.9	0.03	0.01	714.12	1.47	66	28.58	30	151

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Haemulon aurolineatum	3	<0.1	0.5	0.02	0.02	1,438.75	4.41	43	5.36	35	53
Lutjanus jocu	3	<0.1	1.4	0.02	0.01	826.62	1.47	45	19.60	22	84
Trachinotus falcatus	3	<0.1	1.4	0.02	0.01	826.62	1.47	26	4.84	16	31
Elops smithi	2	<0.1	1.0	0.01	0.01	1,014.88	1.47	26	5.50	21	32
Farfantepenaeus aztecus	2	<0.1	1.0	0.01	0.01	1,014.88	1.47	15	0.00	15	15
Lobotes surinamensis	2	<0.1	1.0	0.01	0.01	1,014.88	1.47	189	54.00	135	243
Albula spp.	1	<0.1	0.5	0.01	0.01	1,438.75	1.47	30	.	30	30
Caranx crysos	1	<0.1	0.5	0.01	0.01	1,438.75	1.47	82	.	82	82
Farfantepenaeus duorarum	1	<0.1	0.5	0.01	0.01	1,438.75	1.47	15	.	15	15
Haemulon flavolineatum	1	<0.1	0.5	0.01	0.01	1,438.75	1.47	90	.	90	90
Lutjanus analis	1	<0.1	0.5	0.01	0.01	1,438.75	1.47	96	.	96	96
Lutjanus apodus	1	<0.1	0.5	0.01	0.01	1,438.75	1.47	15	.	15	15
Lutjanus cyanopterus	1	<0.1	0.5	0.01	0.01	1,438.75	1.47	18	.	18	18
Paralichthys albigutta	1	<0.1	0.5	0.01	0.01	1,438.75	1.47	22	.	22	22
Paralichthys lethostigma	1	<0.1	0.5	0.01	0.01	1,438.75	1.47	396	.	396	396
Pogonias cromis	1	<0.1	0.5	0.01	0.01	1,438.75	1.47	245	.	245	245
Totals	**2,747**	**7.8**	**.**	**19.52**	**4.96**	**365.89**	**845.59**	**.**	**.**	**1**	**544**

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.

5 Species Profiles

5.1 Introduction

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

Similar analyses were used to develop recruitment indices for each species examined. Data from stratified-random sampling (SRS) were used to create IOAs for YOY and adults of target species. Starting with the 2013 FIM Annual Report, only monthly SRS data (1996 to present) were used for IOAs as opposed to previous reporting years (1989-2012) that also included seasonal sampling (spring and fall, 1989-1995). Study areas (i.e., estuarine systems) included in the analyses were selected based upon adequate sample sizes of the target species and years of available data, and separate IOAs were calculated for each study area. The specific time periods and sizes of specimens included in the analyses varied among species based upon their individual patterns of recruitment and growth. In general, for each species, only months of peak abundance were included in the analyses. Prior to IOA analyses, length-frequency histograms were examined to determine the size at which the target species fully recruited to the sampling gears.

The annual IOAs representing either juvenile recruitment (YOY IOAs) or the sub-adult and adult portion of the population (Adult IOAs) were computed using generalized linear models. The FIM program's SRS design generates count data, the distribution of which is bounded by zero. Often, the frequency distribution of these counts is highly non-normal; therefore, a Poisson or negative binomial distribution was used as appropriate to create IOAs. This report represents a data summary and not an in-depth analysis of factors affecting abundance, therefore, year is the only factor retained in the model runs for the FIM Annual Report Species Profiles. All IOAs were completed in R version 4.2.1 (R Core Team 2022) using the `MASS` (version 7.3.57, Venables and Ripley (2002)) and `stats` (version 4.2.1, R Core Team (2022)) packages.

Relative abundance was calculated as the median annual number of fish per set. Median values were determined from the least-squares adjusted means by multiplying the standard error by a random normal deviate (m=0, s=1) and adding it to the least-squares mean. These data were then back-transformed (e^x). The process was repeated 500 times for each year to create a sampling distribution of back-transformed values. Summary statistics (median, 25th, and 75th percentiles) were then calculated from this distribution of values to give an unbiased estimate of abundance and its associated error, and plotted to view annual trends in IOAs (Sokal and Rohlf 1969). The median value of this distribution was used to represent the mean index of abundance, while the 25th and 75th percentiles were used as estimates of the standard error of the mean. A weighted least squares regression was used to determine the strength and direction of IOA trends, where a non-significant slope was indicative of a generally stable trend. Weights were assigned as the inverse of the standard error associated with a particular mean estimate. Changes in abundance from the previous year were calculated based on overlapping 95% confidence intervals (i.e., two standard errors above and below each abundance estimate). If confidence intervals overlapped, the two years were deemed to be similar to each other. Note that the error bars shown in all indices of abundance represent one standard error above and below the abundance estimate, and thus are not equivalent to the 95% confidence intervals used to determine annual changes in abundance.

5.2 Common Snook, *Centropomus undecimalis*

Common Snook, *Centropomus undecimalis*, are found in estuaries, adjacent rivers, and in nearshore waters of the tropical and subtropical western Atlantic and Gulf of Mexico (Gilmore et al. 1983; Rivas 1986; Winner et al. 2010). In Florida, Common Snook populations from the Atlantic and Gulf coasts have been genetically identified as separate stocks and are managed separately (Taylor et al. 1993; Tringali and Bert 1996). This species supports an important recreational fishery in Florida and is one of the most popular game fish in state waters. There has been no legal commercial harvest of Common Snook in Florida since the State Legislature declared it a game fish in 1957 and prohibited its sale. Fishing effort targeting Common Snook has increased consistently since the early 1980s on both coasts, but more so on Florida's Gulf coast (Munyandorero et al. 2020). While the overall harvest of Common Snook has declined since the mid-1990s, the numbers of fish caught and released has remained consistently high since the early 1980s (Munyandorero et al. 2020). Recent estimates of transitional spawning potential ratios were near the 40% objective on the Atlantic coast and far exceeded the objective (~60%) on the Gulf coast, therefore both stocks are currently meeting agency management objectives. In response to cold weather induced fish kills that occurred statewide during January 2010, the FWC issued executive orders that prohibited the harvest of Common Snook through August 31, 2010, and subsequent executive orders extended the closure through August 31, 2011 ("Temporary modification of regulations for red drum and snook in southwest florida" 2010). At the June 2011 Florida Fish and Wildlife Conservation Commission Meeting, Commissioners concluded that the Atlantic coast stock was less severely impacted by cold weather than the Gulf coast stock. Based on this information, the Commissioners ruled to reopen Common Snook harvest on September 1, 2011, in Atlantic waters, but Gulf coast waters remained closed through August 31, 2013. Following a red tide event that persisted in the Gulf of Mexico for 16 months in southwest Florida (2017-2019), that area of the fishery was closed in August 2018 and remained closed through May 2022.

Histological evidence shows that Common Snook are protandric hermaphrodites; they begin life as males and some become females after maturation (Taylor et al. 2000). Males typically become sexually mature at ~200 mm standard length (SL) and females at ~680 mm SL. The spawning season for Common Snook extends at least six months; April through September on the Gulf coast and April through October on the Atlantic coast (Taylor et al. 1998).

To monitor year-class strength and to improve the ability to predict future adult Common Snook abundances, the FIM program developed relative indices of abundance (IOAs) of young-of-the-year (YOY) Common Snook recruitment into selected Florida estuaries. Abundance data for YOY Common Snook ≤50 mm SL collected in stratified-random 21.3-m seine samples were examined to assess recruitment into three Florida estuaries: Tampa Bay and Charlotte Harbor on the Gulf coast and the northern and the southern Indian River Lagoon (IRL) on the Atlantic coast. Although collected in limited numbers throughout the year, YOY Common Snook were primarily captured in riverine/creek habitats sampled with 21.3-m seines during their recruitment windows into each estuary: August through November in Tampa Bay, August through February in Charlotte Harbor, July through February in the northern IRL, and August through February in the southern IRL. Data collected from August through December of each year were combined with data from January and February of the following year to create a biological year. Only data from this habitat and these primary time periods were used in developing IOAs for YOY Common Snook.

The FIM program also monitored the relative abundances of large juvenile and adult Common Snook in Florida estuaries within the range of this species. Individuals between 200 mm and 609 mm SL were included in the IOA since they are typically reproductively mature males and serve as a “pre-recruitment” indicator for the fishery. The upper limit of 609 mm SL used in this IOA corresponds to the lower regulatory minimum size of 711 mm total length (TL). Data from stratified-random 183-m haul seines were used to develop IOAs for reproductively mature Common Snook within Cedar Key, Tampa Bay, Sarasota Bay, Charlotte Harbor, northern IRL, and southern IRL. These IOAs were derived by including all Common Snook between 200 – 609 mm SL collected between January and December from 1996 – 2023. Due to historical changes in sampling design and available habitat, only consistently sampled zones and habitats (bay or river) in each estuary were included to generate annual IOAs.

Indices of Abundance

The following figures show relative abundance of young-of-the-year Common Snook (≤50 mm SL) collected in 21.3-m seines and of pre-fishery subadult and adult Common Snook (200-609 mm SL) collected in 183-m haul seines during stratified-random sampling across all estuaries. Points represent an unbiased estimate of the mean abundance (calculated as the median value of the distribution of model estimates), while the vertical bars represent the standard error of the estimate (calculated as the 25th-75th percentiles of model estimates). Note different scales for estimates from 21.3-m and 183-m seines.

Cedar Key

In the Cedar Key estuary, Common Snook catches were zero or near-zero between 1997 and 2016 (Figure 5.1). These low levels of abundance in Cedar Key waters are consistent with the historical range of this temperature-sensitive species in Florida (Taylor et al. 1993; Winner et al. 2010). However, recent effects of climate change (i.e., increasing water temperatures, more temperate winters) have resulted in an obvious range extension for Common Snook on Florida's Gulf coast (Purtlebaugh et al. 2020). Pre-fishery subadult and adult Common Snook abundance from Cedar Key in 2023 did not differ significantly from the previous year.

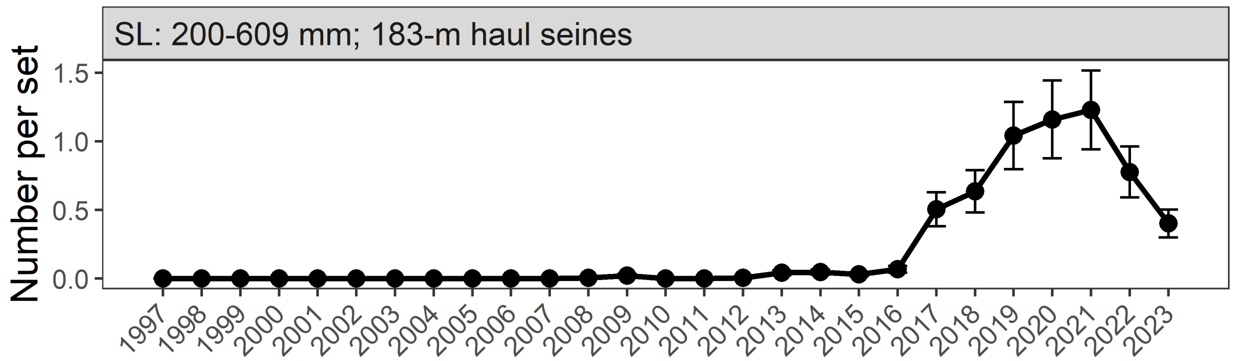

Figure 5.1: Relative abundance of subadult/adult Common Snook collected between 1997 and 2023 during stratified-random sampling of Cedar Key.

Tampa Bay

Annual IOAs of YOY Common Snook in river habitats of Tampa Bay did not show a significant trend since 1996 (Figure 5.2). Relative abundance of YOY Common Snook in river habitats in 2023 decreased from the previous year.

Annual IOAs of pre-fishery subadult and adult Common Snook in Tampa Bay did not show a significant trend since 1996 (Figure 5.2). Relative abundance of pre-fishery subadult and adult Common Snook in 2023 increased from the previous year.

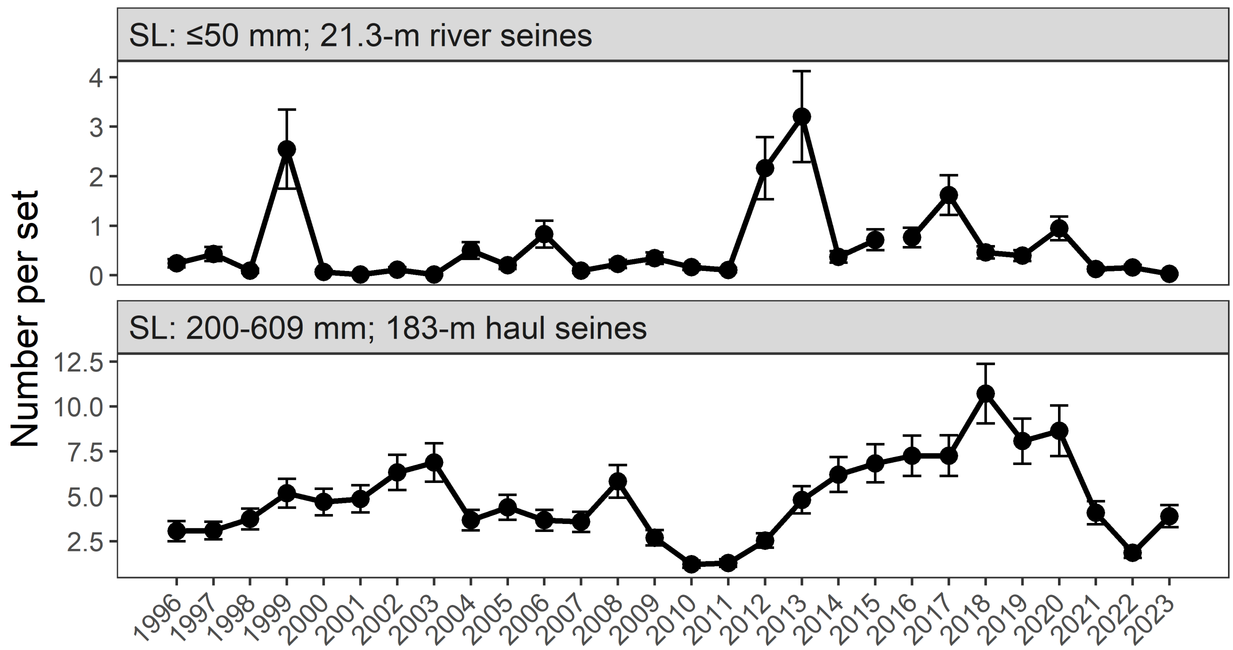

Figure 5.2: Relative abundance of young-of-the-year and subadult/adult Common Snook collected between 1996 and 2023 during stratified-random sampling of Tampa Bay. Note that dedicated juvenile snook sampling in previously underrepresented habitats (i.e., tidal creeks and tributaries) began in 2016. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Sarasota Bay

Annual IOAs of pre-fishery subadult and adult Common Snook in Sarasota Bay did not show a significant trend since 2010 (Figure 5.3). Relative abundance of pre-fishery subadult and adult Common Snook in 2023 did not differ significantly from the previous year.

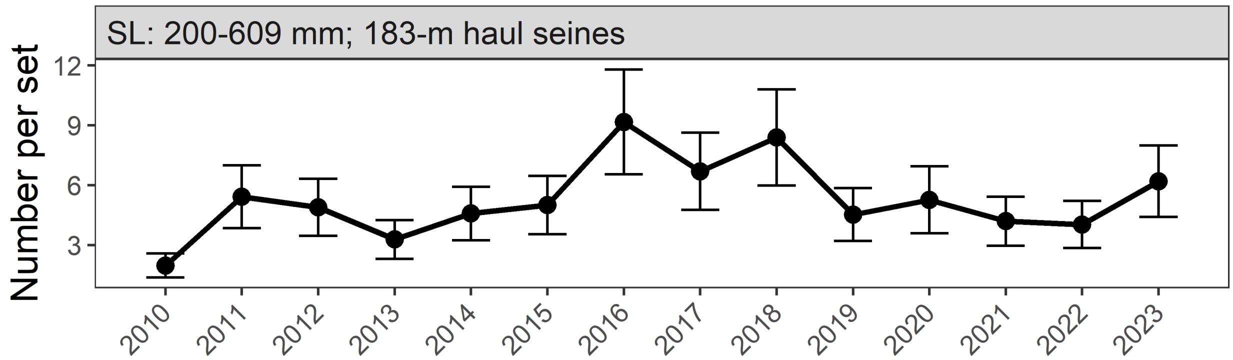

Figure 5.3: Relative abundance of subadult/adult Common Snook collected between 2010 and 2023 during bimonthly stratified-random sampling of Sarasota Bay.

Charlotte Harbor

Annual IOAs of YOY Common Snook in river habitats of Charlotte Harbor did not show a significant trend since 2016 (Figure 5.4). Relative abundance of YOY Common Snook in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of pre-fishery subadult and adult Common Snook in Charlotte Harbor did not show a significant trend since 1996 (Figure 5.4). Relative abundance of pre-fishery subadult and adult Common Snook in 2023 decreased from the previous year.

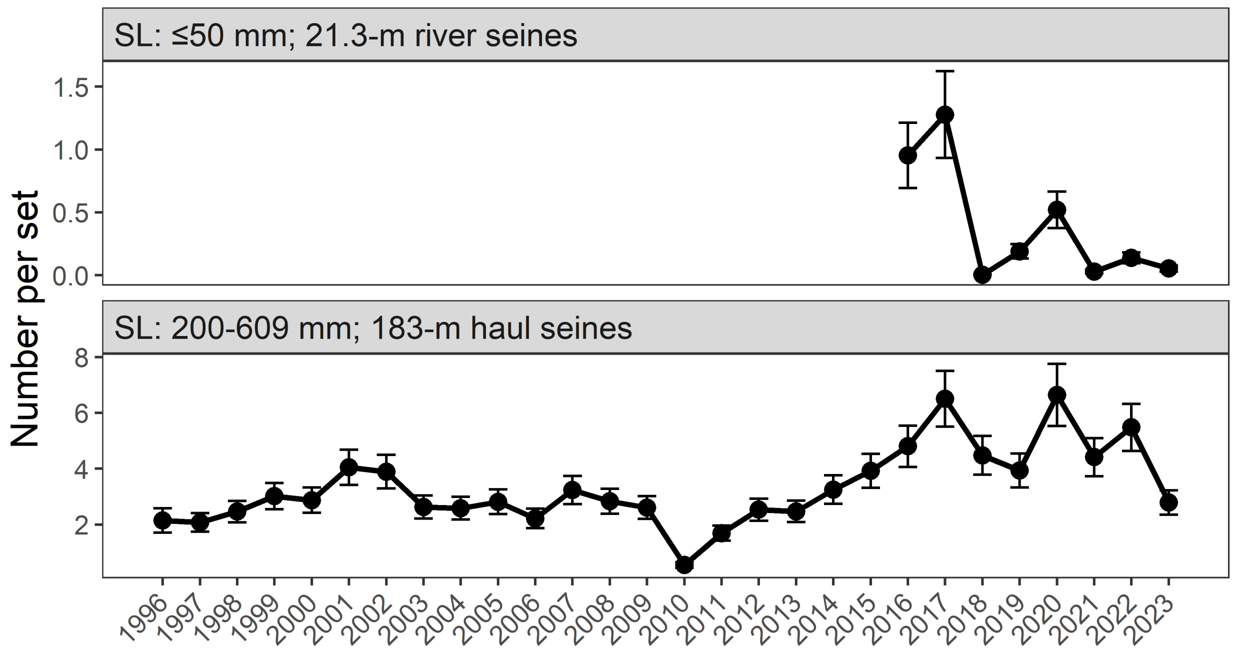

Figure 5.4: Relative abundance of young-of-the-year and subadult/adult Common Snook collected between 1996 and 2023 during stratified-random sampling of Charlotte Harbor. Note that dedicated juvenile snook sampling in previously underrepresented habitats (i.e., tidal creeks and tributaries) began in 2016. These changes are reflected in the IOA timeseries where we report IOAs beginning in 2016.

Northern Indian River Lagoon

Annual IOAs of YOY Common Snook in river habitats of the northern Indian River Lagoon did not show a significant trend since 1999 (Figure 5.5). Relative abundance of YOY Common Snook in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of pre-fishery subadult and adult Common Snook in the northern Indian River Lagoon have generally decreased since 1997 (Figure 5.5). Relative abundance of pre-fishery subadult and adult Common Snook in 2023 did not differ significantly from the previous year.

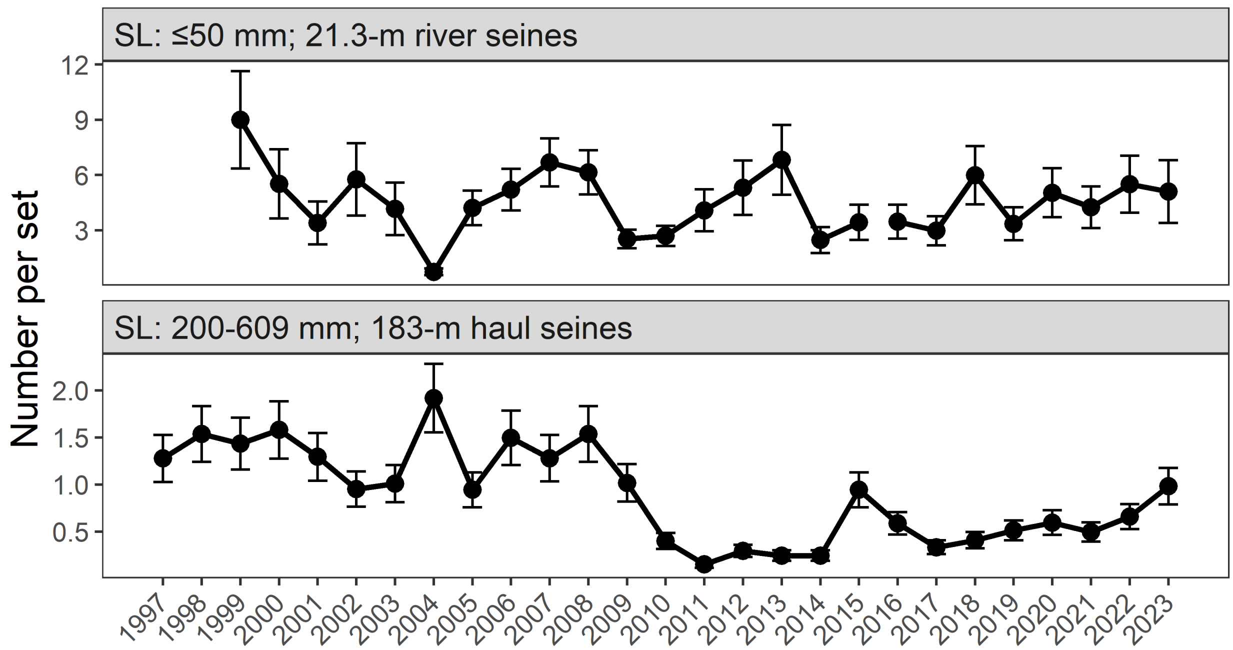

Figure 5.5: Relative abundance of young-of-the-year and subadult/adult Common Snook collected between 1997 and 2023 during stratified-random sampling of the northern Indian River Lagoon. Note that dedicated juvenile snook sampling in previously underrepresented habitats (i.e., tidal creeks and tributaries) began in 2016. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Southern Indian River Lagoon

Annual IOAs of YOY Common Snook in river habitats of the southern Indian River Lagoon did not show a significant trend since 2016 (Figure 5.6). Relative abundance of YOY Common Snook in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of pre-fishery subadult and adult Common Snook in the southern Indian River Lagoon have generally decreased since 1997 (Figure 5.6). Relative abundance of pre-fishery subadult and adult Common Snook in 2023 did not differ significantly from the previous year.

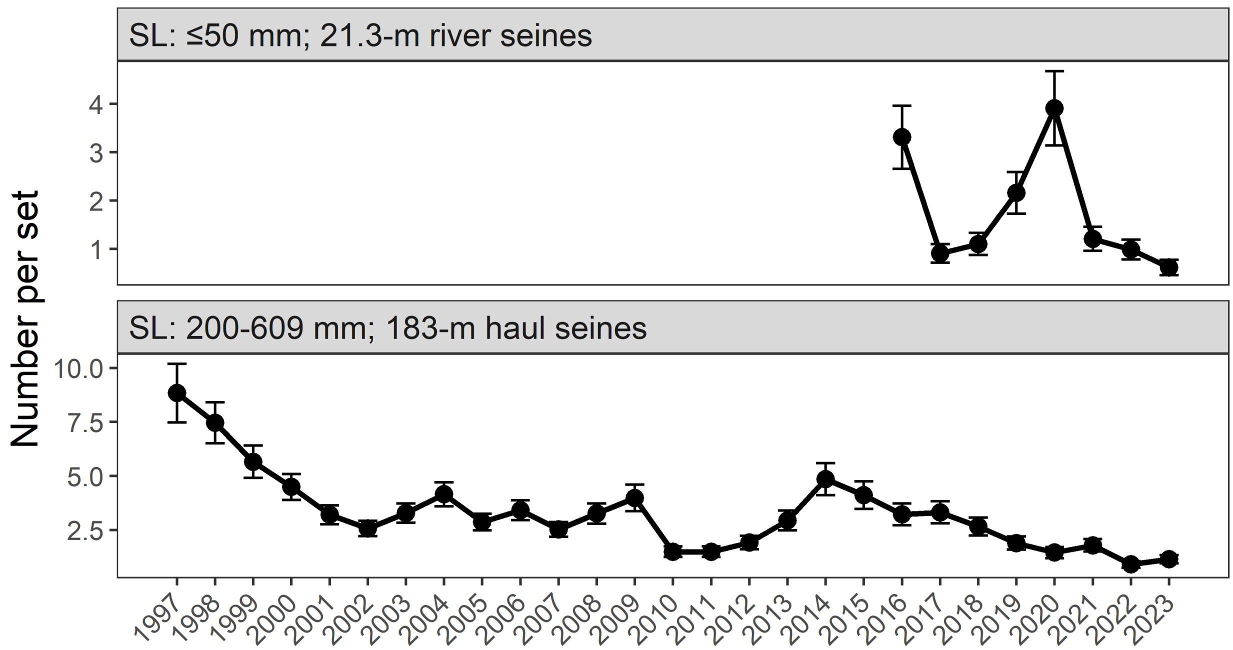

Figure 5.6: Relative abundance of young-of-the-year and subadult/adult Common Snook collected between 1997 and 2023 during stratified-random sampling of the southern Indian River Lagoon. Note that dedicated juvenile snook sampling in previously underrepresented habitats (i.e., tidal creeks and tributaries) began in 2016. These changes are reflected in the IOA timeseries where we report IOAs beginning in 2016.

Length-Frequency Diagrams

The following figure shows length frequency diagrams of Common Snook collected in 183-m haul seines. All lengths are standard length (SL). Note different scales and years of collection for each estuary. Length-frequency data collected with 183-m haul seines indicate that this gear provides valuable information on larger juvenile and adult Common Snook in Florida estuaries (Figure 5.7). Common Snook length frequency distributions generally followed a unimodal distribution with modes varying across estuaries.

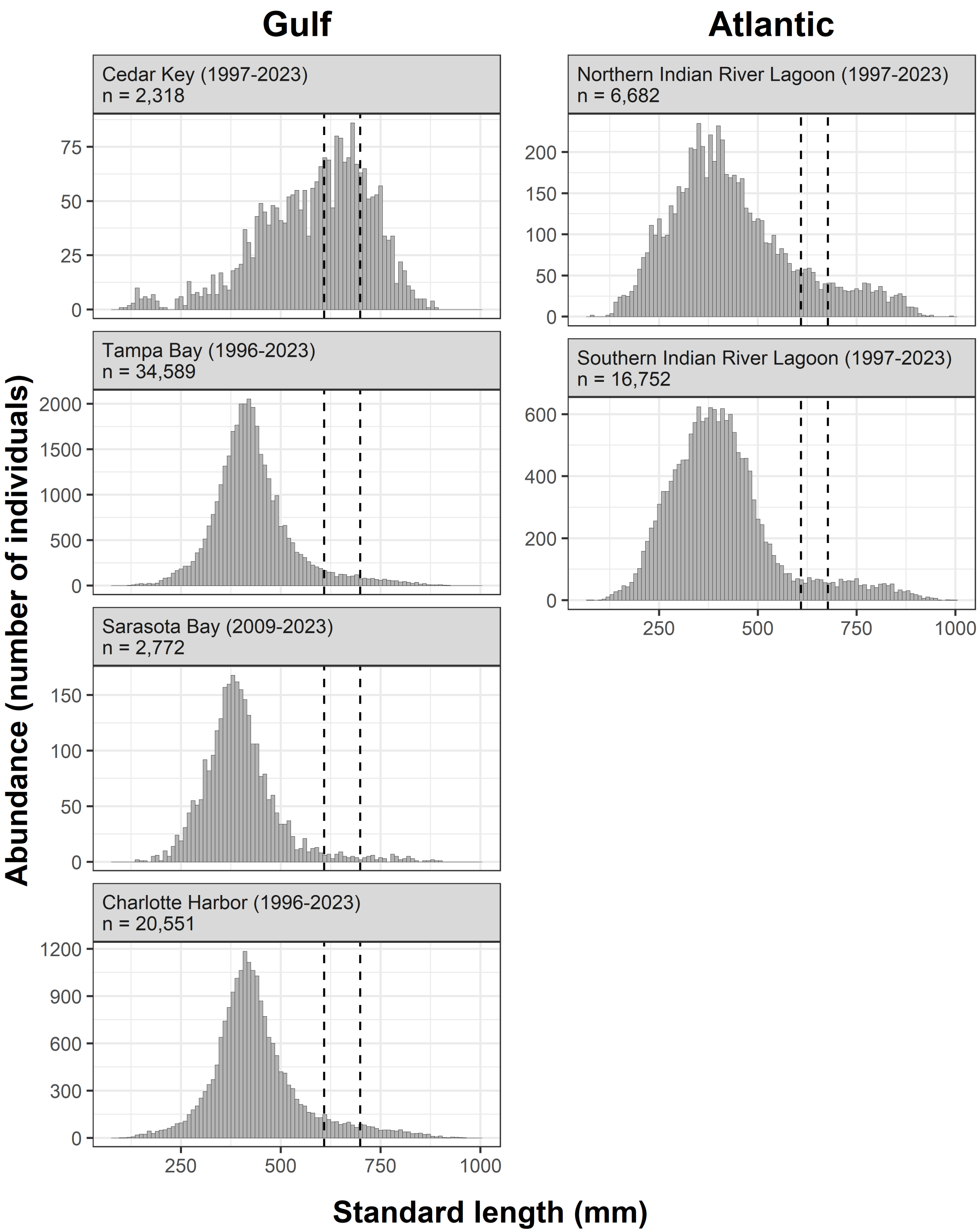

Figure 5.7: Length frequency diagrams of Common Snook collected in 183-m haul seines. Vertical dashed lines indicate the lower and upper recreational size limits for Common Snook in each estuary.

5.3 Red Drum, *Sciaenops ocellatus*

The Red Drum, *Sciaenops ocellatus*, is an estuarine-dependent species inhabiting coastal waters from Massachusetts to northern Mexico (Yokel 1966; Reagan 1985). This species supports important recreational fisheries throughout the U.S. South Atlantic and Gulf of Mexico coasts. In Florida, dramatic stock reductions in the mid-1980s resulted in a 1986 moratorium on commercial and recreational Red Drum fisheries. In 1989, the fishery was reopened with strict size and bag limits, as well as a no-sale provision that effectively eliminated the commercial Red Drum fishery in Florida. Since that time, Red Drum stocks have recovered significantly. In the 2020 stock assessment, model predictions for age-specific indices of Red Drum indicated that populations in Florida exceeded the Florida Fish and Wildlife Conservation Commission's (FWC) management target of at least a 40% escapement rate (geometric mean of 2017-2019) in three (NW, SW, NE) of the four statewide assessment regions (Addis 2020). In these three regions, Red Drum are not considered overfished nor undergoing overfishing. The SE region of Florida exceeded the escapement rate management target (55%) in 2019, the terminal year of the assessment, but did not meet the escapement rate management target over the three-year time period analyzed. Current escapement rates for 2017-2019 were 48% in the NW, 72% in the SW, 61% in the NE, and 35% in the SE region (Addis 2020). In addition, continued improvement of escapement rates within the northeast management region of the state led to an increase of the daily bag limit from one to two fish in early 2012 and a renewed interest in opening coastal Red Drum to harvest in the Gulf. However, bag limits within the southern and northwest management areas of the state are at one fish per person per day. Bag limits within the southern management areas of the state have remained at one fish per person per day since 1989.

Following a red tide event that persisted for 16 months in southwest Florida (2017-2019) the Red Drum fishery was closed in state waters of Pasco County south to Gordon Pass (Collier County) through Executive Order (EO), ("Temporary modification of regulations for red drum and snook in southwest florida" 2018) in August 2018. This EO was subsequently modified in 2019 to include Spotted Seatrout ("Temporary modification of regulations for spotted seatrout in southwest florida" 2019), and extended through additional EOs ("Temporary modification of regulations for red drum, snook, and spotted seatrout in southwest florida" 2019, 2020) through May 2021. Based on indicators and stakeholder feedback suggesting that fisheries in the Tampa Bay area had improved since the prolonged 2017-2019 red tide bloom, the Redfish fishery was reopened from Pinellas County south to State Road 64 in Manatee County in October 2021 ("Temporary modification of regulations for red drum, snook, and spotted seatrout in the tampa bay area" 2021). The Red Drum fishery remained closed south of State Road 64 (Manatee County) south through Gordon Pass through August 2022 ("Temporary modification of regulations for red drum, snook, and spotted seatrout in a portion of southwest florida" 2021; "Temporary modification of regulations for red drum, snook, and spotted seatrout in southwest florida" 2022).

In September 2022, the FWC adopted a more holistic management approach for Red Drum focused on smaller management regions, in which management decisions are informed by 6 management metrics: escapement, relative abundance, habitat, harmful algal blooms, fishing effort, and stakeholder feedback. The management plan established 9 smaller regions evaluated yearly for potential changes in Red Drum regulations. The IOAs described here are the "relative abundance" metric used by the FWC in their annual reviews for Red Drum management. Currently, the Indian River Lagoon is the only management region in which Red Drum are closed for recreational harvest.

In Florida, adult Red Drum spawn from mid-August through late November (Yokel 1966). Spawning occurs primarily near bay mouths, inlets, or over nearshore continental shelf waters (Mercer 1984; Murphy and Taylor 1990), and in some locations inside estuaries (Murphy and Taylor 1990; Johnson and Funicelli 1991). In Florida estuaries, recruitment of juveniles begins in September and continues through February, with peaks occurring in October and November (Reagan 1985; Peters and McMichael 1987; Daniel 1988). Settlement of young-of-the-year (YOY) Red Drum typically occurs in the middle to upper reaches of estuaries, away from ocean inlets or passes, and can be strongly influenced by the availability of low to moderate salinity habitats (Bacheler et al. 2008). On both coasts, large juvenile Red Drum enter the fishery at approximately 15-18 months of age, and are fully recruited at the beginning of their third year (age-2, Chagaris et al. 2015). The legal recreational slot limit (457-686 mm total length (TL); 18-27 inches TL) includes predominantly age-1 and age-2 fish. Red Drum greater than 700 mm standard length (SL) are uncommon in the Fisheries-Independent Monitoring (FIM) program samples from west Florida estuaries, but are occasionally collected on the east coast in the Indian River Lagoon (IRL), [FWC-FWRI (2015)].

In an effort to monitor year-class strength and to improve the ability to predict future adult Red Drum abundances, relative indices of abundance (IOAs) were developed to estimate YOY Red Drum recruitment into selected Florida estuaries. Abundance data for YOY Red Drum (≤40 mm SL) that were collected in stratified-random 21.3-m seine samples were examined to assess recruitment in eight Florida estuaries: Apalachicola Bay, Cedar Key, Tampa Bay, Sarasota Bay, Charlotte Harbor, northeast Florida, and the northern and southern IRL. Young-of-the-year Red Drum recruited to habitats sampled with 21.3-m seines primarily from September through February. Data collected from September through December of each year were combined with data from January through February of the following year to create a biological year of data. The IOAs for 2023, therefore, only included data from September through December 2023. Separate analyses for river and bay sets were conducted when possible to examine differences in recruitment between the two habitats. Annual IOAs were also developed for legal-size Red Drum that fall within the permitted recreational harvest size range (457-686 mm TL, 374-565 mm SL, (Murphy and Taylor 1990)) in each estuary, including the southern IRL. These IOAs included all legal-size Red Drum collected in stratified-random 183-m haul seines during each calendar year (January-December). Due to historical changes in sampling design and available habitat, only consistently sampled zones and habitats (bay or river) in each estuary were included to generate annual IOAs.

Indices of Abundance

The following figures show relative abundance of young-of-the-year Red Drum (≤40 mm SL) collected in 21.3-m seines and of legal-sized Red Drum (374-565 mm SL) collected in 183-m haul seines during stratified-random sampling across all estuaries. Points represent an unbiased estimate of the mean abundance (calculated as the median value of the distribution of model estimates), while the vertical bars represent the standard error of the estimate (calculated as the 25th-75th percentiles of model estimates). Note different scales for estimates from 21.3-m and 183-m seines.

Apalachicola Bay

Annual IOAs of YOY Red Drum in bay habitats of Apalachicola Bay did not show a significant trend since 1998 (Figure 5.8). Relative abundance of YOY Red Drum in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of legal-sized Red Drum in Apalachicola Bay have generally increased since 1998 (Figure 5.8). Relative abundance of legal-sized Red Drum in 2023 did not differ significantly from the previous year.

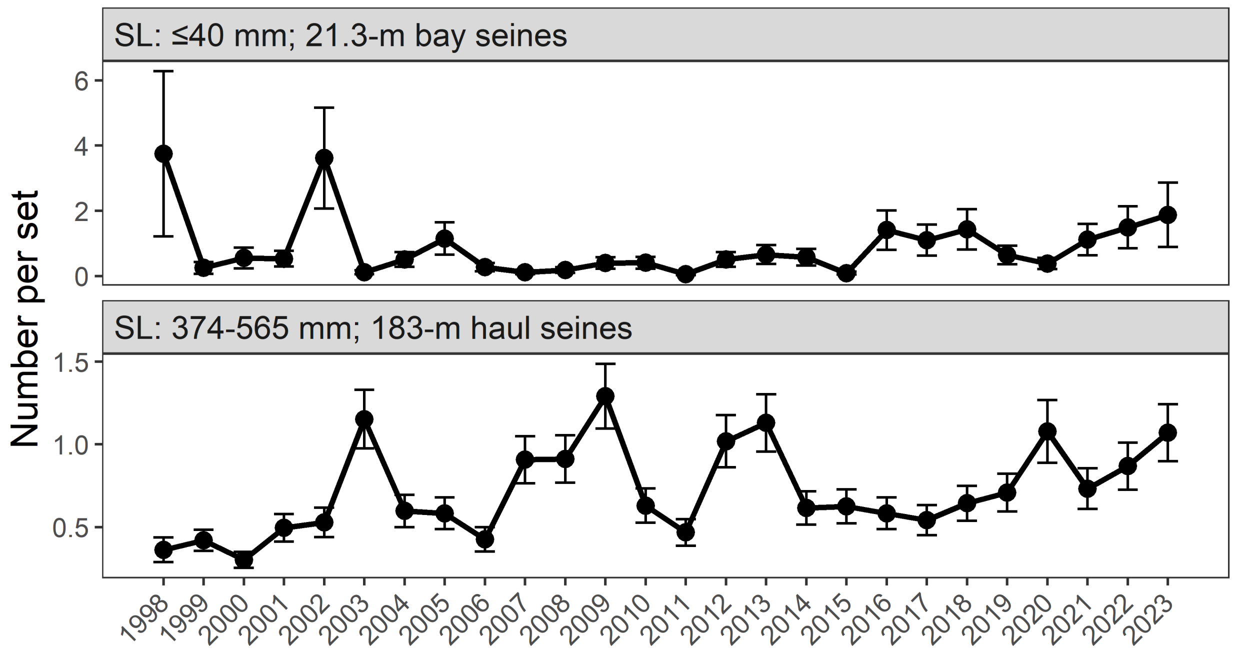

Figure 5.8: Relative abundance of young-of-the-year and legal Red Drum collected between 1998 and 2023 during stratified-random sampling of Apalachicola Bay.

Cedar Key

Annual IOAs of YOY Red Drum in river habitats of Cedar Key did not show a significant trend since 1996 (Figure 5.9). Relative abundance of YOY Red Drum in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Red Drum in bay habitats of Cedar Key did not show a significant trend since 1996 (Figure 5.9). Relative abundance of YOY Red Drum in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of legal-sized Red Drum in Cedar Key have generally decreased since 1997 (Figure 5.9). Relative abundance of subadult Red Drum in 2023 did not differ significantly from the previous year.

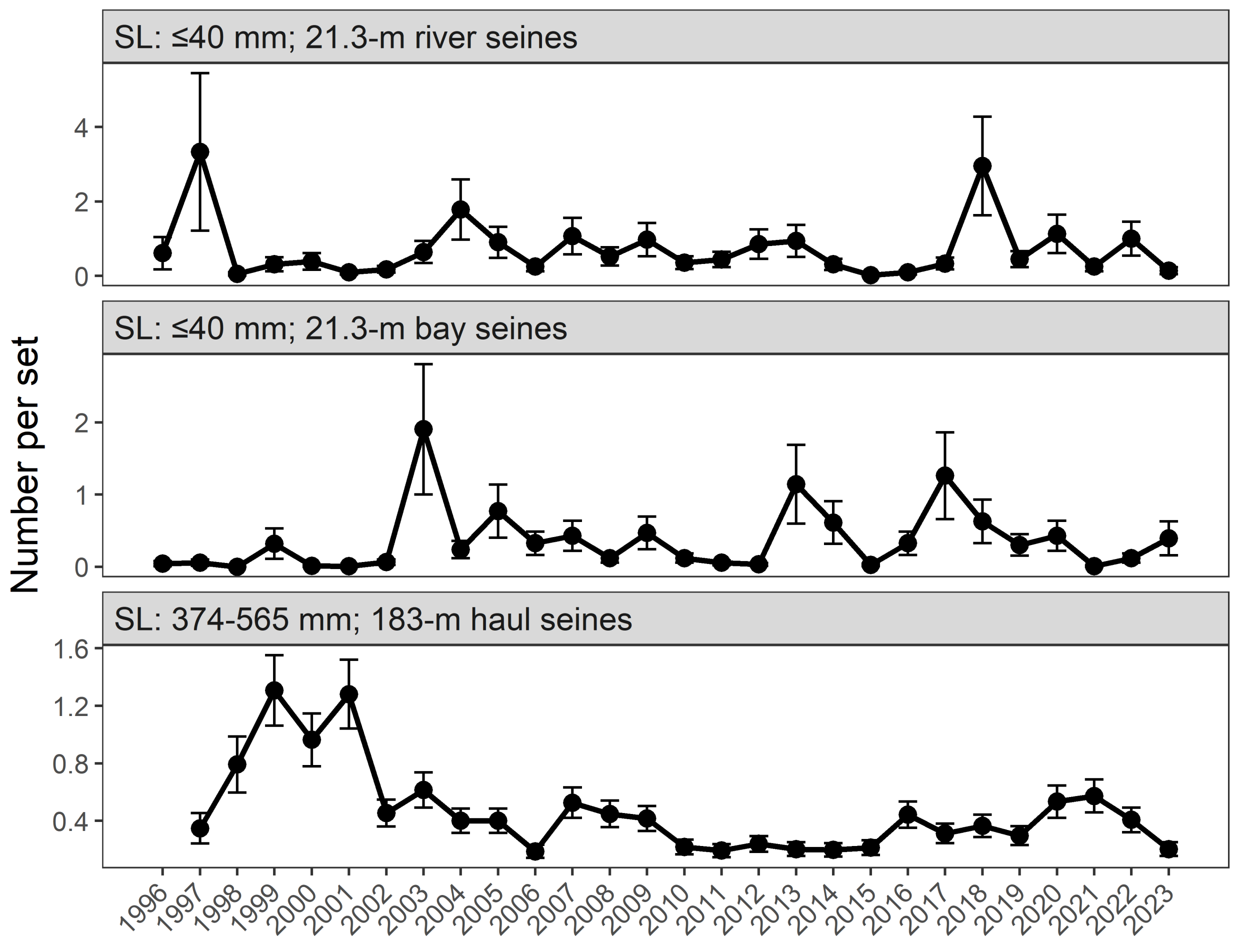

Figure 5.9: Relative abundance of young-of-the-year and legal Red Drum collected between 1996 and 2023 during stratified-random sampling of Cedar Key.

Tampa Bay

Annual IOAs of YOY Red Drum in river habitats of Tampa Bay have generally decreased since 1996 (Figure 5.10). Relative abundance of YOY Red Drum in river habitats in 2023 decreased from the previous year.

Annual IOAs of YOY Red Drum in bay habitats of Tampa Bay did not show a significant trend since 1996 (Figure 5.10). Relative abundance of YOY Red Drum in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of legal-sized Red Drum in Tampa Bay did not show a significant trend since 1996 (Figure 5.10). Relative Abundance of subadult Red Drum in 2023 did not differ significantly from the previous year.

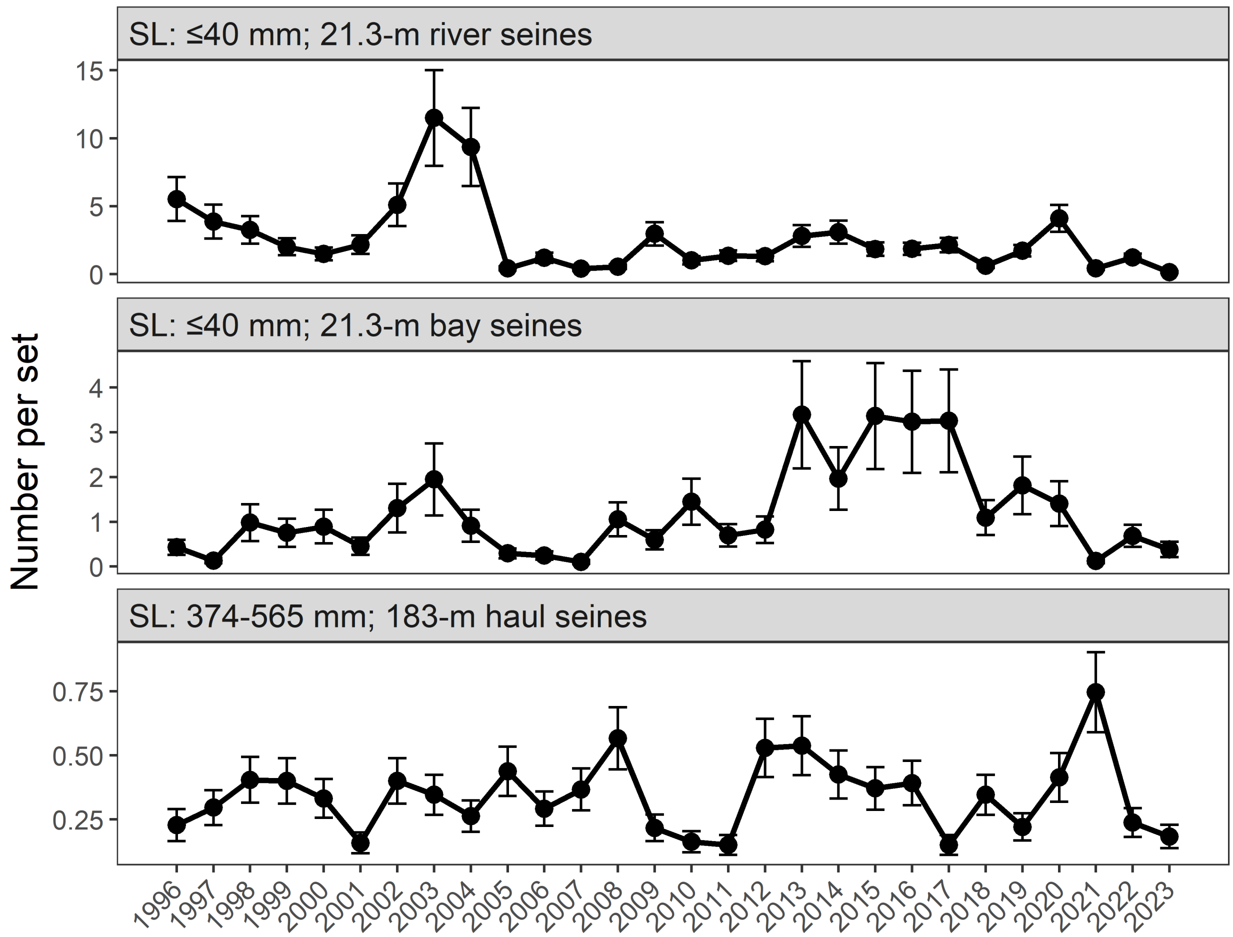

Figure 5.10: Relative abundance of young-of-the-year and legal Red Drum collected between 1996 and 2023 during stratified-random sampling of Tampa Bay. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Sarasota Bay

Annual IOAs of YOY Red Drum in bay habitats of Sarasota Bay did not show a significant trend since 2009 (Figure 5.11). Relative abundance of YOY Red Drum in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of legal-sized Red Drum in Sarasota Bay did not show a significant trend since 2010 (Figure 5.11). Relative abundance of subadult Red Drum in 2023 did not differ significantly from the previous year.

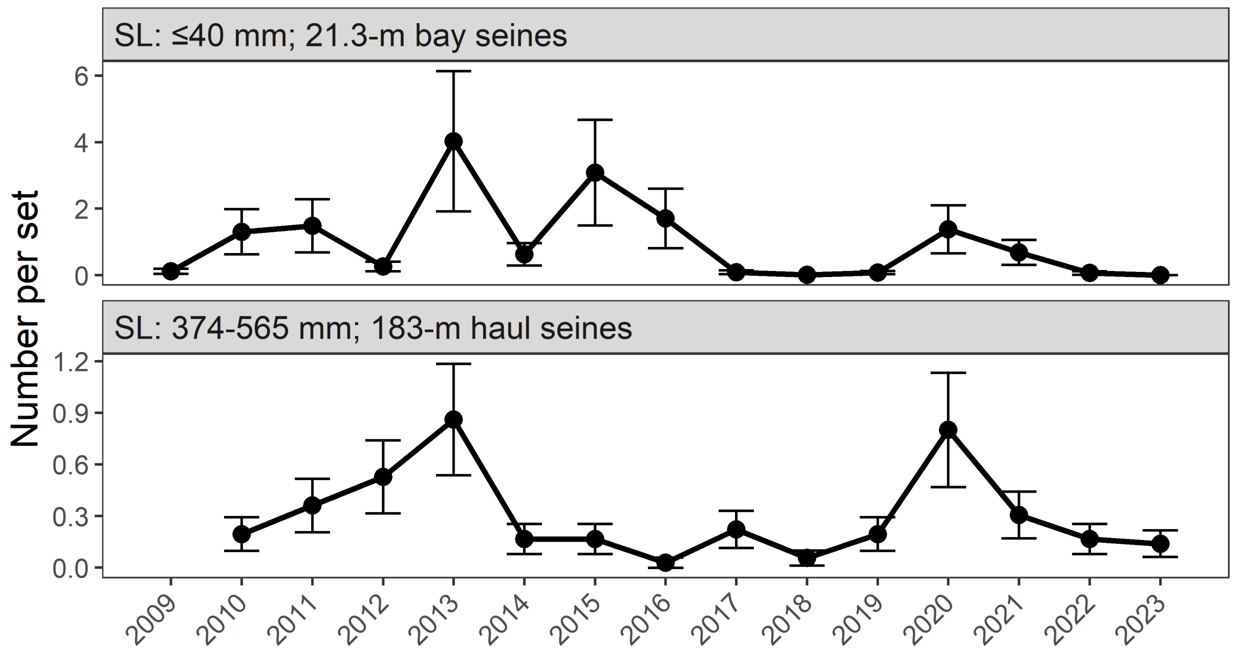

Figure 5.11: Relative abundance of young-of-the-year and legal Red Drum collected between 2009 and 2023 during stratified-random sampling of Sarasota Bay.

Charlotte Harbor

Annual IOAs of YOY Red Drum in river habitats of Charlotte Harbor did not show a significant trend since 1996 (Figure 5.12). Relative abundance of YOY Red Drum in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Red Drum in bay habitats of Charlotte Harbor did not show a significant trend since 1996 (Figure 5.12). Relative abundance of YOY Red Drum in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of legal-sized Red Drum in Charlotte Harbor did not show a significant trend since 1996 (Figure 5.12). Relative abundance of subadult Red Drum in 2023 did not differ significantly from the previous year.

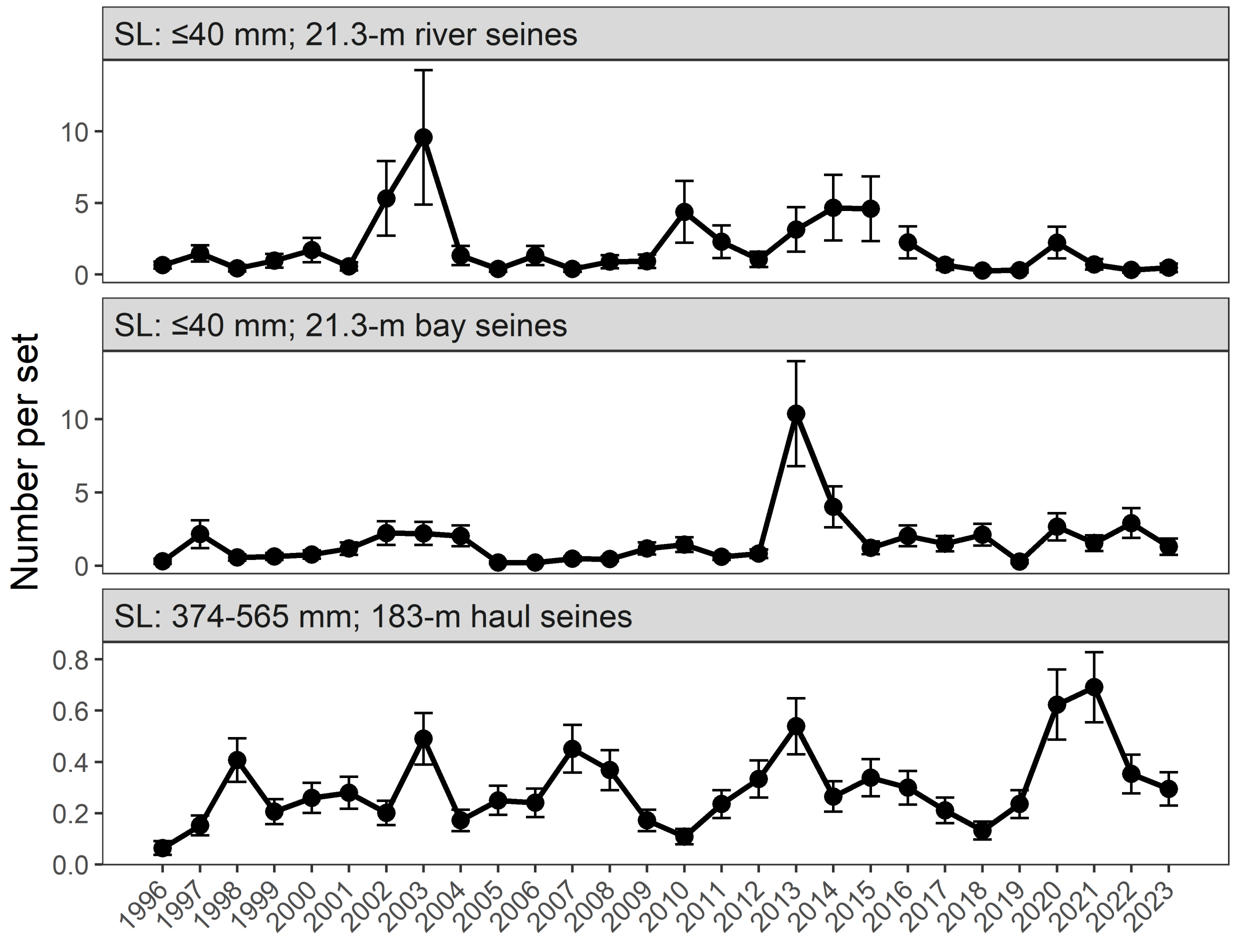

Figure 5.12: Relative abundance of young-of-the-year and legal Red Drum collected between 1996 and 2023 during stratified-random sampling of Charlotte Harbor. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Northeast Florida

Annual IOAs of YOY Red Drum in river habitats of northeast Florida did not show a significant trend since 2001 (Figure 5.13). Relative abundance of YOY Red Drum in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of legal-sized Red Drum in northeast Florida have generally decreased since 2001 (Figure 5.13). Relative abundance of subadult Red Drum in 2023 did not differ significantly from the previous year.

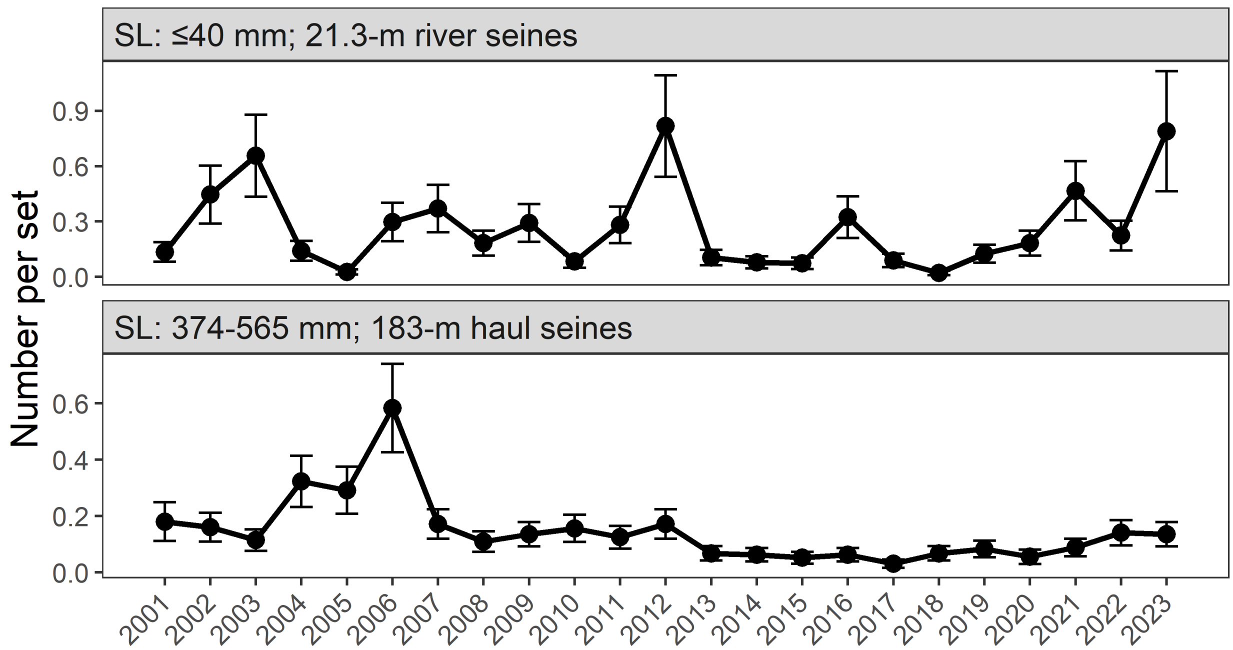

Figure 5.13: Relative abundance of young-of-the-year and legal Red Drum collected between 2001 and 2023 during stratified-random sampling of northeast Florida.

Northern Indian River Lagoon

Annual IOAs of YOY Red Drum in river habitats of the northern Indian River Lagoon did not show a significant trend since 1999 (Figure 5.14). Relative abundance of YOY Red Drum in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Red Drum in bay habitats of the northern Indian River Lagoon have generally increased since 1996 (Figure 5.14). Relative abundance of YOY Red Drum in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of legal-sized Red Drum in the northern Indian River Lagoon have generally decreased since 1997 (Figure 5.14). Relative abundance of subadult Red Drum in 2023 did not differ significantly from the previous year.

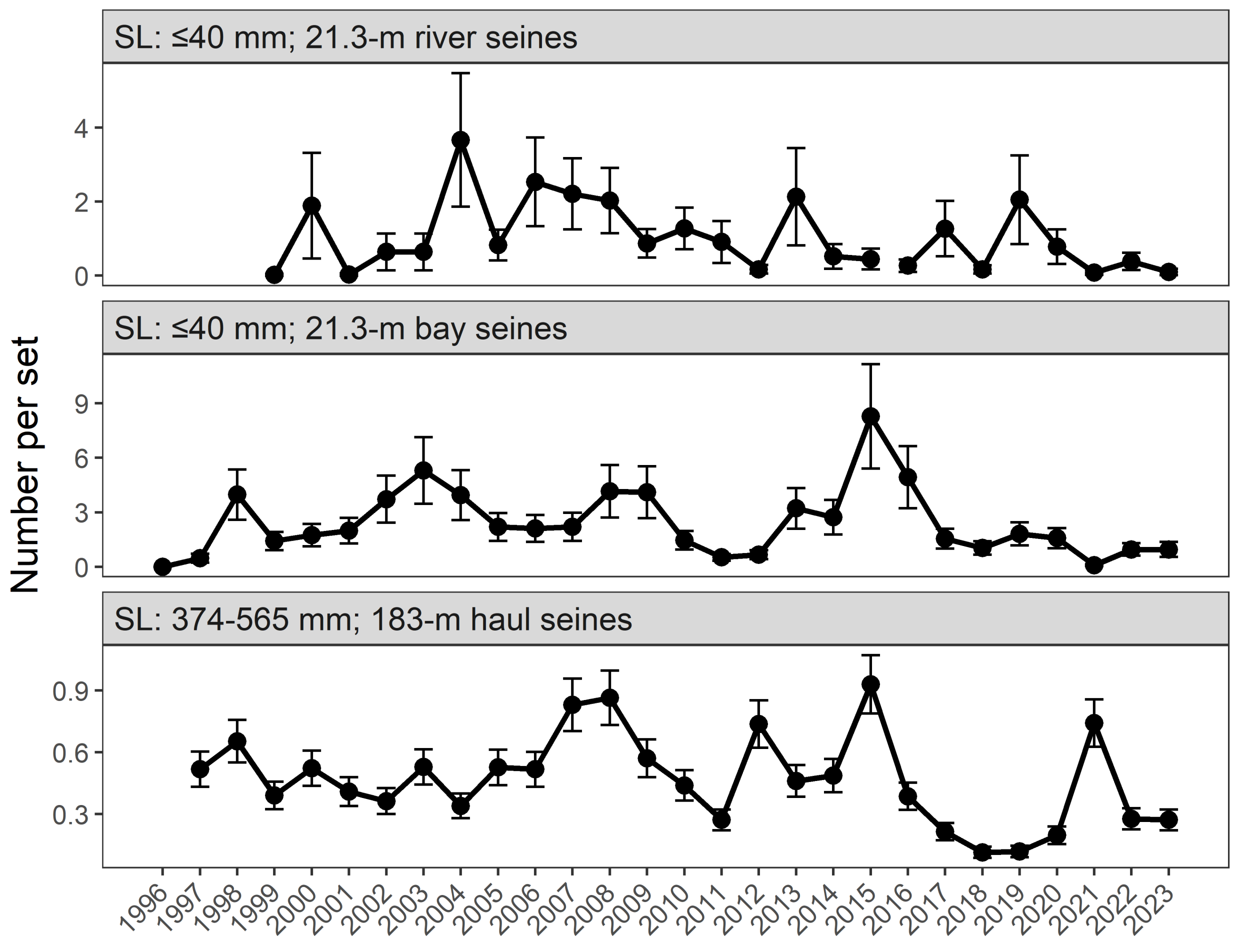

Figure 5.14: Relative abundance of young-of-the-year and legal Red Drum collected between 1996 and 2023 during stratified-random sampling of the northern Indian River Lagoon. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA time-series between 2015 and 2016.

Southern Indian River Lagoon

Annual IOAs of YOY Red Drum in river habitats of the southern Indian River Lagoon did not show a significant trend since 2016 (Figure 5.15). Relative abundance of YOY Red Drum in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of legal-sized Red Drum in the southern Indian River Lagoon did not show a significant trend since 1997 (Figure 5.15). Relative abundance of subadult Red Drum in 2023 did not differ significantly from the previous year.

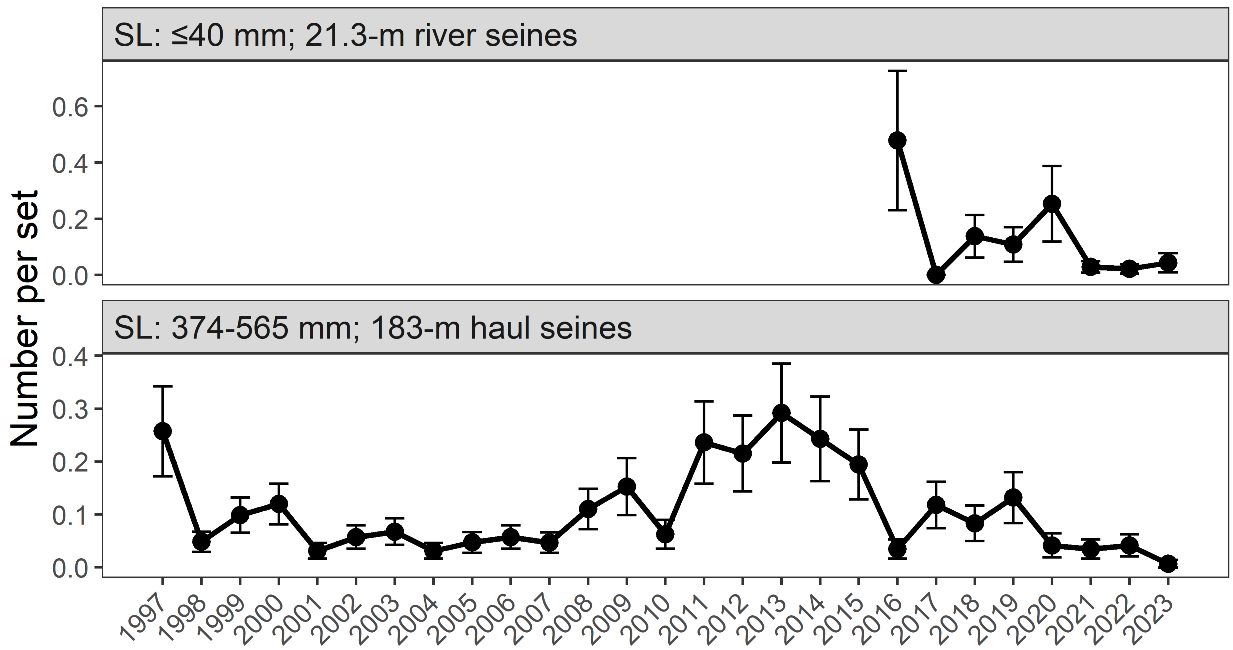

Figure 5.15: Relative abundance of young-of-the-year and legal Red Drum collected between 1997 and 2023 during stratified-random sampling of the southernIndian River Lagoon. Note that river sampling began in 2016 to include previously underrepresented habitats (i.e., tidal creeks and tributaries).

Length-Frequency Diagrams

The following figure shows length frequency diagrams of Red Drum collected in 183-m haul seines. All lengths are standard length (SL). Note different scales and years of collection for each estuary. Length-frequency data collected with 183-m haul seines indicate that this gear provides valuable information on larger juvenile and adult Red Drum in Florida estuaries (Figure 5.16). Red Drum length frequency distributions generally followed a polymodal distribution across estuaries. In addition, the length-frequency in all estuaries declined sharply after the upper slot limit. Large Red Drum (age-4 and older) at these sizes are becoming sexually mature, and will leave the estuaries to move to coastal areas to join schools of other reproductively mature individuals, with the exception of a portion of the population in the northern IRL that resides and spawns within the estuary (Johnson and Funicelli 1991; Reyier et al. 2011).

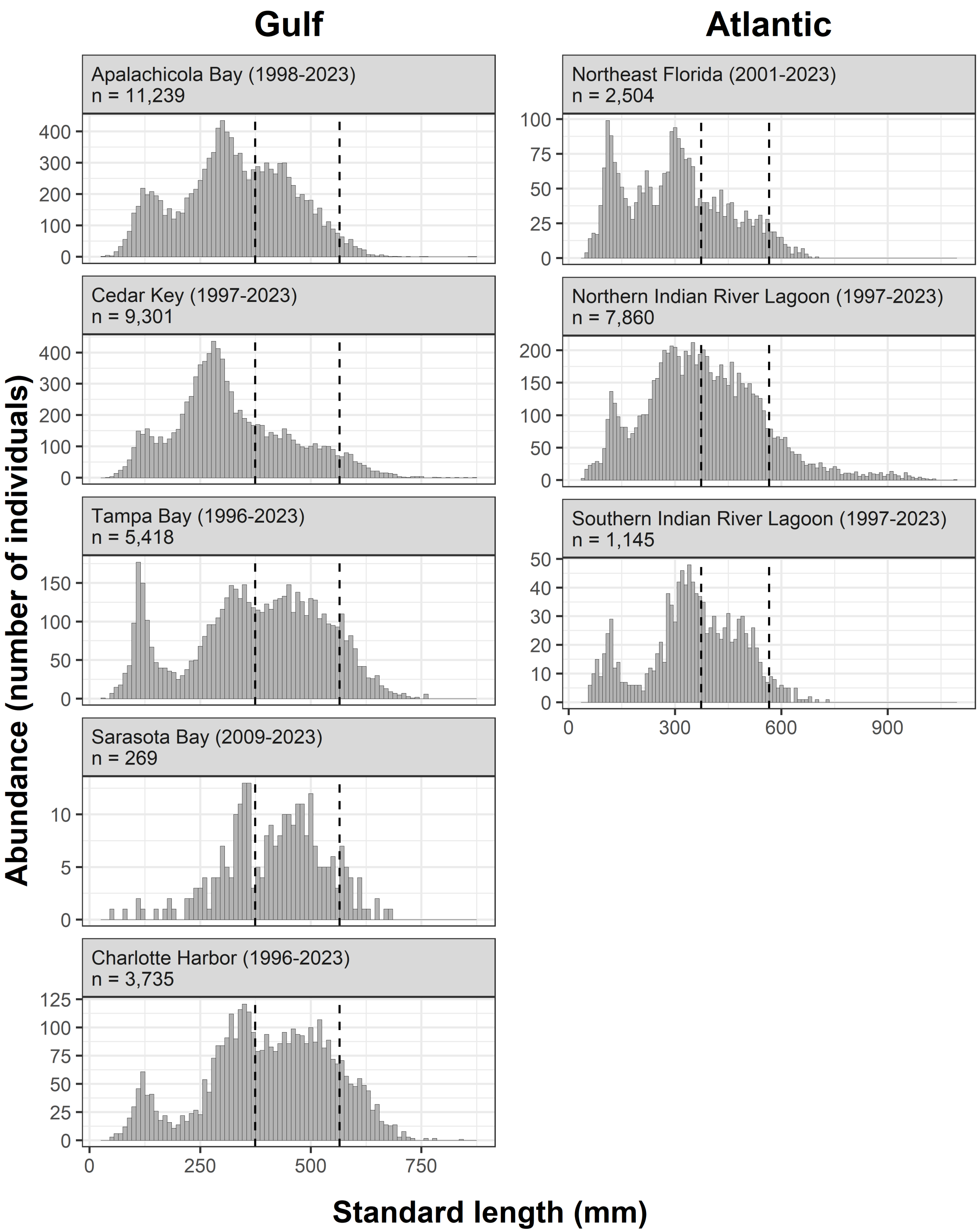

Figure 5.16: Length frequency diagrams of Red Drum collected in 183-m haul seines. Vertical dashed lines indicate the lower and upper recreational size limits for Red Drum in each estuary.

5.4 Spotted Seatrout, *Cynoscion nebulosus*

Spotted Seatrout, *Cynoscion nebulosus*, occur in temperate to tropical estuarine and coastal waters on the Atlantic and Gulf coasts of the United States (Bortone 2002). In Florida, Spotted Seatrout have historically supported economically important recreational and commercial fisheries. Overall, annual commercial landings of Spotted Seatrout in Florida declined quite slowly during the period 1950 through the 1970s (Murphy et al. 2011). During the early 1990s, statewide commercial landings never exceeded much more than 500,000 fish and dropped drastically to fewer than 50,000 fish after implementation of the constitutional amendment significantly limiting the use of entangling gear in 1995 and the establishment of a 3-month open season in 1996. Declines in the number of commercial trips from the mid-1980s to more recent years were over 90% on the Atlantic coast and nearly 99% on the Gulf coast (Murphy et al. 2011). With these regulatory changes, the Spotted Seatrout fishery has moved from a mixed-sector fishery, to primarily a recreational fishery that makes up more than 99% of the total landings in Florida (13,133,000 fish during 2011-2015, Addis et al. 2018) Between 1990 and 2022 various commercial and recreational fishing regulations have been adopted in an effort to support the rebuilding of Spotted Seatrout stocks (Murphy and Nelson 1999; Addis et al. 2023). In Florida, studies have indicated the presence of Spotted Seatrout stock subdivisions with most of the major estuaries having a separate stock (Iversen and Tabb 1962; Seyoum et al. 2014). Since 2012 the FWC has managed Spotted Seatrout in four different regions, increasing to five regions in 2020, with different regulations in each region (Addis et al. 2023). Over the years, various management regulations have been exercised based upon updated stock assessments and regional responses to environmental perturbations (i.e., red tides), which at various times have resulted in seasonal and emergency closures for each of the management zones. There have also been adjustments to the legal harvest size of Spotted Seatrout, with the most recent change adopted February 1, 2020 which set a recreational slot limit of 325-410 mm SL (15-19 in TL).

Adult Spotted Seatrout begin to spawn in March or April in Tampa Bay and Charlotte Harbor (McMichael and Peters 1989) and in April or May in the northern Indian River Lagoon (IRL), Cedar Key, Apalachicola (Moody 1949; Tabb 1961; Crabtree and Adams 1998; DeVries et al. 2002), and Northeast Florida (MacDonald et al. 2009). Spotted Seatrout are generally reproductively mature at age 2 (males ≥200 mm standard length [SL], females ≥235 mm SL, Murphy et al. 2011). Protracted spawning of Spotted Seatrout continues throughout the summer and into late September or October, depending upon location (Murphy and Nelson 1999). Spawning generally occurs during the evening hours in deep channels and depressions near grass flats in estuarine areas with water temperatures >21°C (Tabb 1961; Helser et al. 1993). Estuarine water temperatures below 20°C may reduce hatching success for Spotted Seatrout (Gray et al. 1991).

In an effort to monitor year-class strength and to improve the ability to predict future adult Spotted Seatrout abundances, relative indices of abundance (IOAs) were developed for young-of-the-year (YOY) Spotted Seatrout recruitment into selected Florida estuaries. Abundance data for YOY Spotted Seatrout (≤100 mm SL) collected from stratified-random 21.3-m seine samples were examined to assess recruitment in eight Florida estuaries: Apalachicola Bay, Cedar Key, Tampa Bay, Sarasota Bay, Charlotte Harbor, northeast Florida, northern IRL, and southern IRL. Young-of-the-year Spotted Seatrout recruited to habitats sampled with 21.3-m seines primarily from April through October in Tampa Bay, Sarasota Bay, and Charlotte Harbor, and from May through November in Cedar Key, northeast Florida, northern IRL, and southern IRL. In Apalachicola Bay, recruitment of YOY Spotted Seatrout was evident from June through October. These recruitment periods coincide with published recruitment and spawning periods of Spotted Seatrout throughout Florida (Moody 1949; Nelson and Leffler 2001; DeVries et al. 2002; Walters et al. 2007). Therefore, these bay-specific months were used to define the respective recruitment seasons for each estuary in subsequent analyses. Indices were not calculated for estuaries where 21.3-m seines were not deployed or where limited data were available. Data from stratified-random 183-m haul seines collected within these same Florida estuarine systems (including the southern IRL) were used to develop IOAs for adult Spotted Seatrout (≥200 mm SL). Indices for adult fish were derived by including all Spotted Seatrout ≥200 mm SL collected between January and December from 1996 to 2023. Due to historical changes in sampling design and available habitat, only consistently sampled zones and habitats (bay or river) in each estuary were included to generate annual IOAs.

Indices of Abundance

The following figures show relative abundance of young-of-the-year Spotted Seatrout (≤100 mm SL) collected in 21.3-m seines and of adult Spotted Seatrout (>200 mm SL) collected in 183-m haul seines during stratified-random sampling across all estuaries. Points represent an unbiased estimate of the mean abundance (calculated as the median value of the distribution of model estimates), while the vertical bars represent the standard error of the estimate (calculated as the 25th-75th percentiles of model estimates). Note different scales for estimates from 21.3-m and 183-m seines.

Apalachicola Bay

Annual IOAs of YOY Spotted Seatrout in bay habitats of Apalachicola Bay have generally increased since 1998 (Figure 5.17). Relative abundance of YOY Spotted Seatrout in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Spotted Seatrout in Apalachicola Bay did not show a significant trend since 1998 (Figure 5.17). Relative abundance of adult Spotted Seatrout in 2023 did not differ significantly from the previous year.

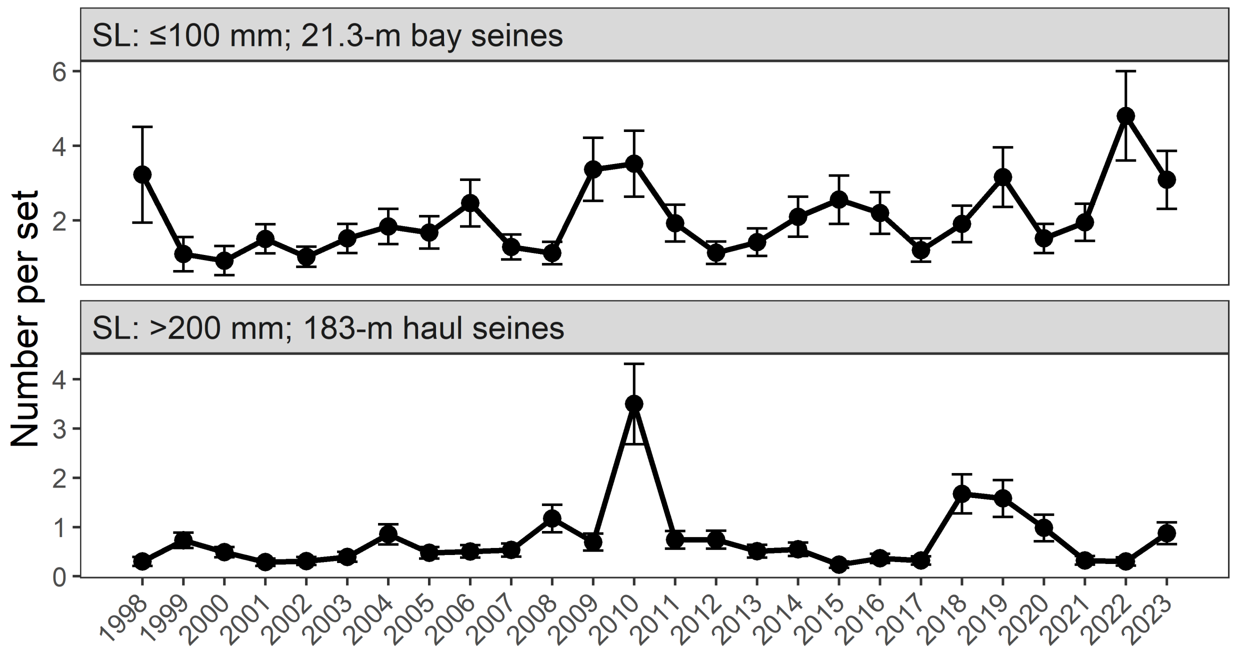

Figure 5.17: Relative abundance of young-of-the-year and adult Spotted Seatrout collected between 1998 and 2023 during stratified-random sampling of Apalachicola Bay.

Cedar Key

Annual IOAs of YOY Spotted Seatrout in river habitats of Cedar Key have generally decreased since 1996 (Figure 5.18). Relative abundance of YOY Spotted Seatrout in river habitats in 2023 decreased from the previous year.

Annual IOAs of YOY Spotted Seatrout in bay habitats of Cedar Key did not show a significant trend since 1996 (Figure 5.18). Relative abundance of YOY Spotted Seatrout in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Spotted Seatrout in Cedar Key did not show a significant trend since 1997 (Figure 5.18). Relative abundance of adult Spotted Seatrout in 2023 did not differ significantly from the previous year.

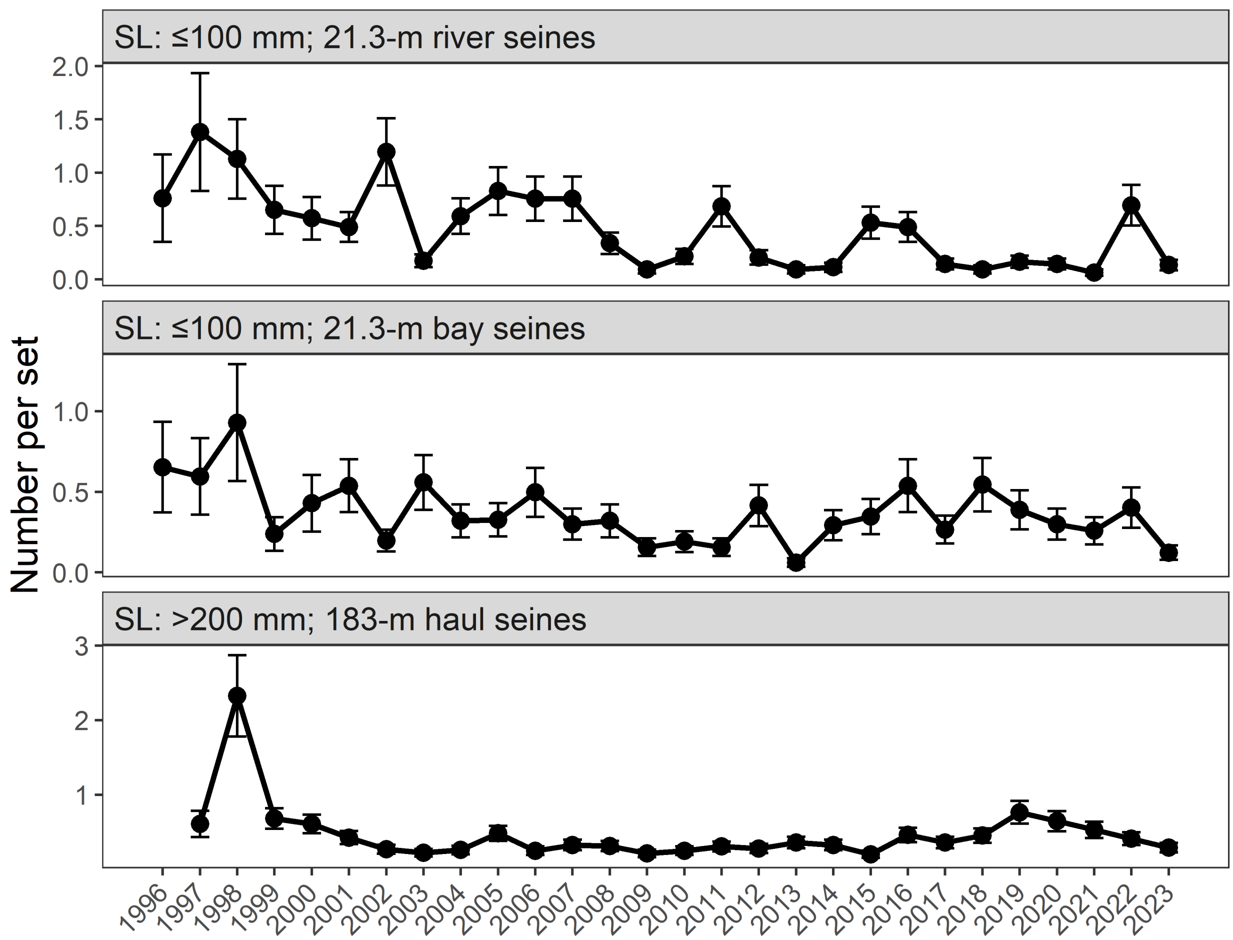

Figure 5.18: Relative abundance of young-of-the-year and adult Spotted Seatrout collected between 1996 and 2023 during stratified-random sampling of Cedar Key.

Tampa Bay

Annual IOAs of YOY Spotted Seatrout in river habitats of Tampa Bay have generally decreased since 1996 (Figure 5.19). Relative abundance of YOY Spotted Seatrout in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Spotted Seatrout in bay habitats of Tampa Bay have generally decreased since 1996 (Figure 5.19). Relative abundance of YOY Spotted Seatrout in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Spotted Seatrout in Tampa Bay did not show a significant trend since 1996 (Figure 5.19). Relative abundance of adult Spotted Seatrout in 2023 did not differ significantly from the previous year.

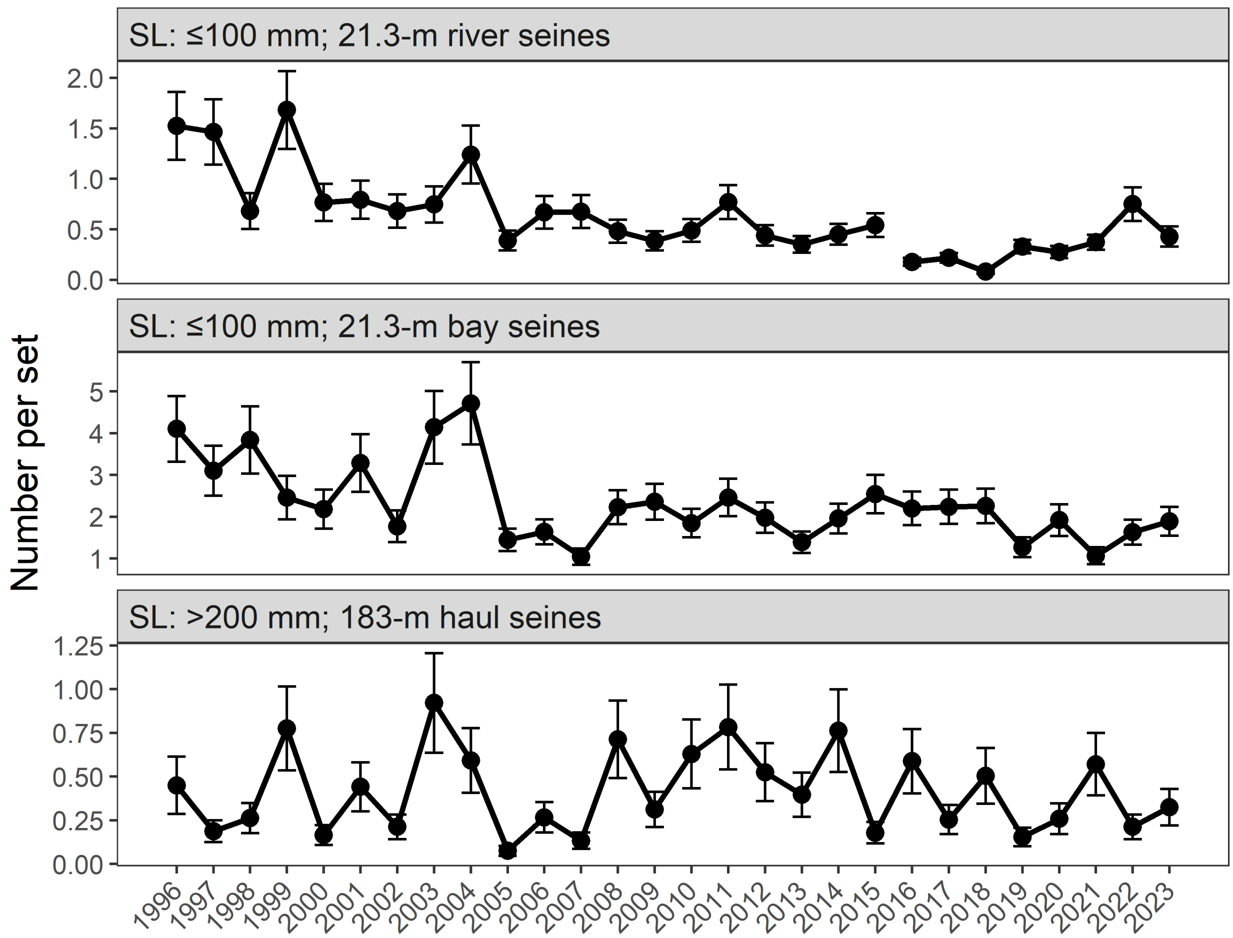

Figure 5.19: Relative abundance of young-of-the-year and adult Spotted Seatrout collected between 1996 and 2023 during stratified-random sampling of Tampa Bay. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Sarasota Bay

Annual IOAs of YOY Spotted Seatrout in bay habitats of Sarasota Bay did not show a significant trend since 2009 (Figure 5.20). Relative abundance of YOY Spotted Seatrout in bay habitats in 2023 decreased from the previous year.

Annual IOAs of adult Spotted Seatrout in Sarasota Bay did not show a significant trend since 2010 (Figure 5.20). Relative abundance of adult Spotted Seatrout in 2023 did not differ significantly from the previous year.

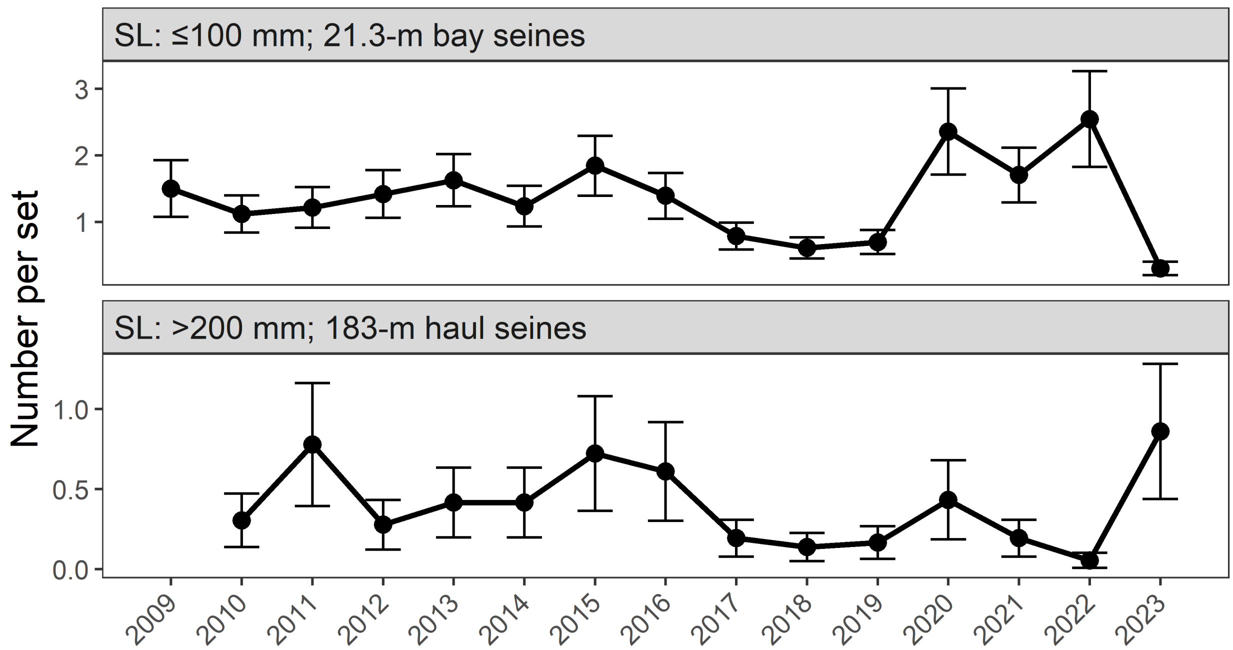

Figure 5.20: Relative abundance of young-of-the-year and adult Spotted Seatrout collected between 2009 and 2023 during stratified-random sampling of Sarasota Bay.

Charlotte Harbor

Annual IOAs of YOY Spotted Seatrout in river habitats of Charlotte Harbor have generally decreased since 1996 (Figure 5.21). Relative abundance of YOY Spotted Seatrout in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Spotted Seatrout in bay habitats of Charlotte Harbor have generally decreased since 1996 (Figure 5.21). Relative abundance of YOY Spotted Seatrout in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Spotted Seatrout in Charlotte Harbor did not show a significant trend since 1996 (Figure 5.18). Relative abundance of adult Spotted Seatrout in 2023 did not differ significantly from the previous year.

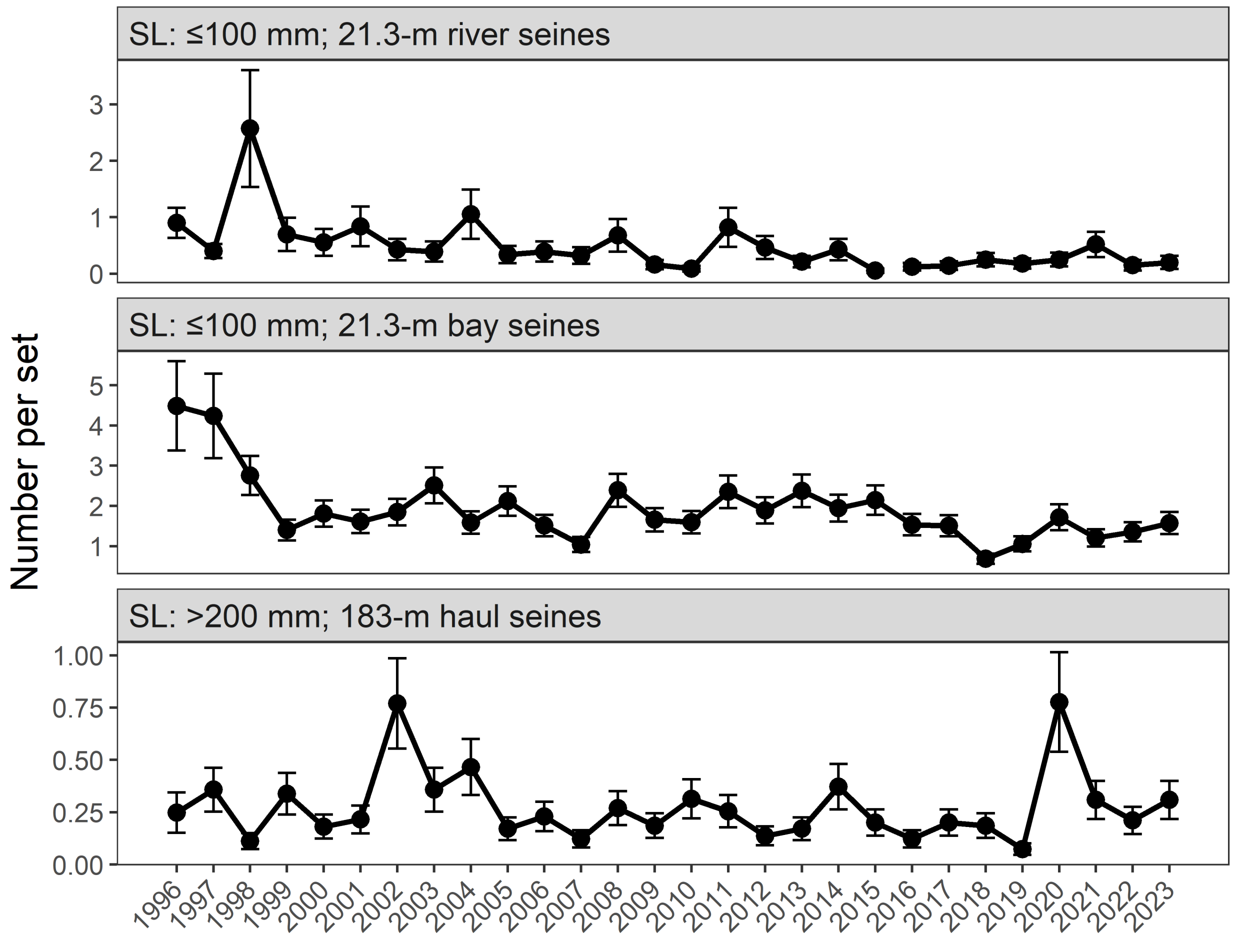

Figure 5.21: Relative abundance of young-of-the-year and adult Spotted Seatrout collected between 1996 and 2023 during stratified-random sampling of Charlotte Harbor. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Northeast Florida

Annual IOAs of YOY Spotted Seatrout in river habitats of northeast Florida have generally decreased since 2001 (Figure 5.22). Relative abundance of YOY Spotted Seatrout in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Spotted Seatrout in northeast Florida have generally decreased since 2001 (Figure 5.22). Relative abundance of adult Spotted Seatrout in 2023 did not differ significantly from the previous year.

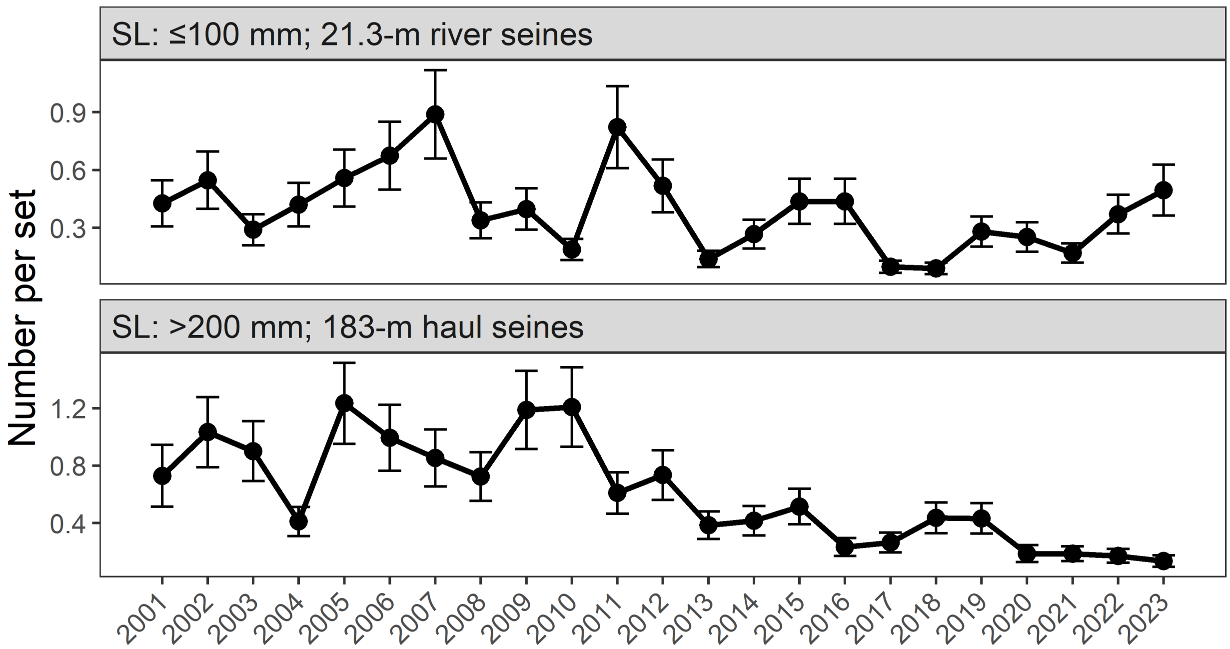

Figure 5.22: Relative abundance of young-of-the-year and adult Spotted Seatrout collected between 2001 and 2023 during stratified-random sampling of northeast Florida.

Northern Indian River Lagoon

Annual IOAs of YOY Spotted Seatrout in river habitats of the northern Indian River Lagoon did not show a significant trend since 1999 (Figure 5.23). Relative abundance of YOY Spotted Seatrout in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Spotted Seatrout in bay habitats of the northern Indian River Lagoon have generally decreased since 1996 (Figure 5.23). Relative abundance of YOY Spotted Seatrout in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Spotted Seatrout in the northern Indian River Lagoon did not show a significant trend since 1997 (Figure 5.23). Relative abundance of adult Spotted Seatrout in 2023 did not differ significantly from the previous year.

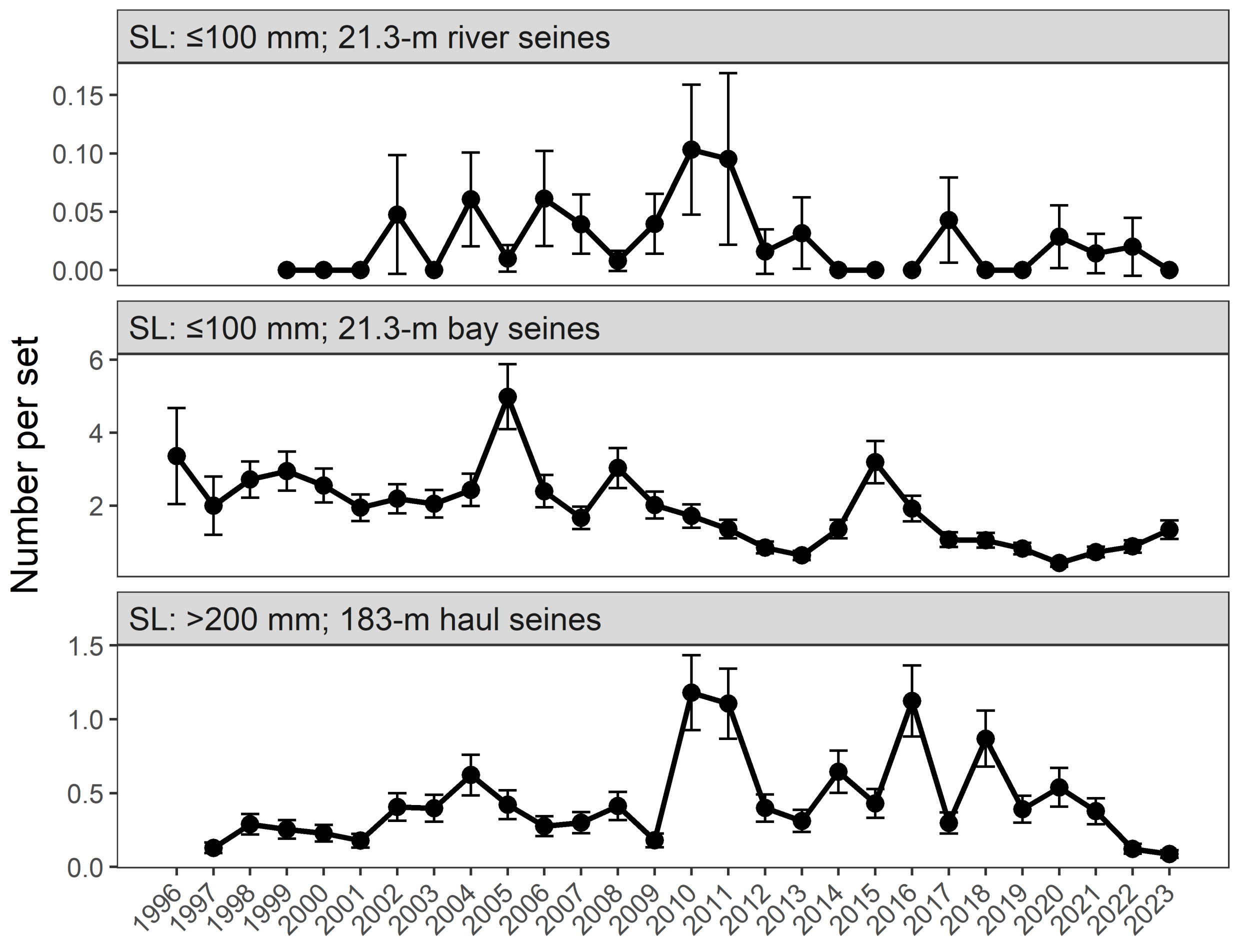

Figure 5.23: Relative abundance of young-of-the-year and adult Spotted Seatrout collected between 1996 and 2023 during stratified-random sampling of the northern Indian River Lagoon. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Southern Indian River Lagoon

Annual IOAs of YOY Spotted Seatrout in river habitats of the southern Indian River Lagoon did not show a significant trend since 2016 (Figure 5.24). Relative abundance of YOY Spotted Seatrout in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Spotted Seatrout in the southern Indian River Lagoon did not show a significant trend since 1997 (Figure 5.24). Relative abundance of adult Spotted Seatrout in 2023 did not differ significantly from the previous year.

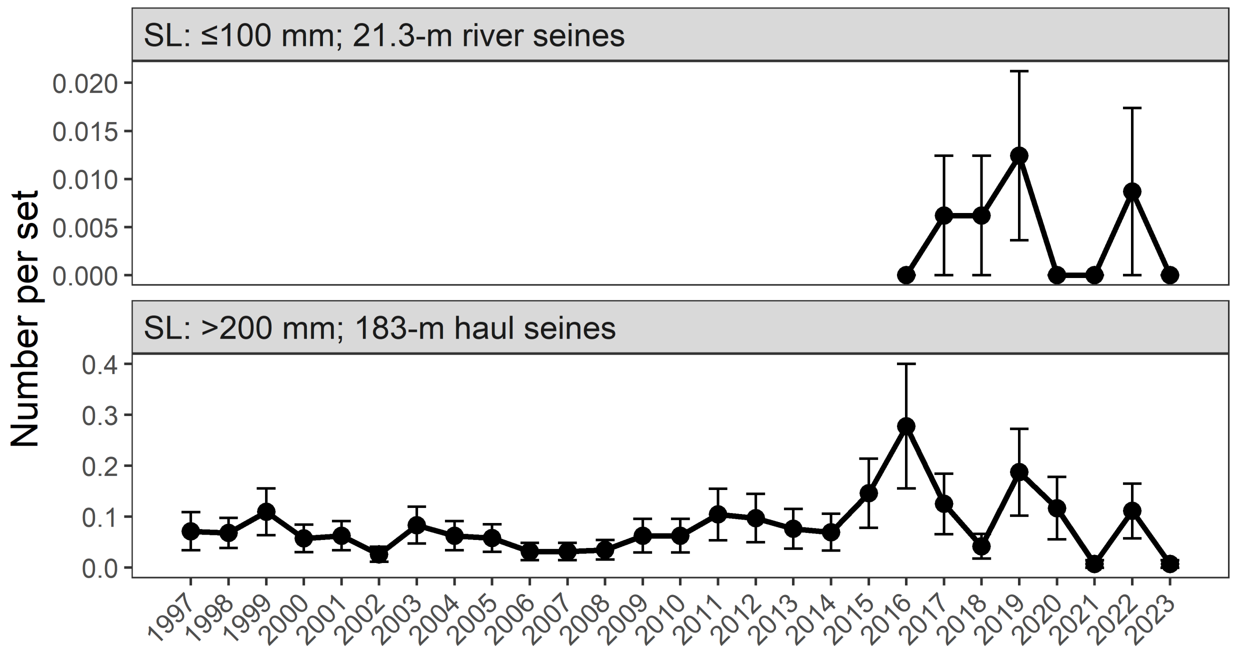

Figure 5.24: Relative abundance of young-of-the-year and adult Spotted Seatrout collected between 1997 and 2023 during stratified-random sampling of the southern Indian River Lagoon. Note that river sampling began in 2016 to include previously underrepresented habitats (i.e., tidal creeks and tributaries).

Length-Frequency Diagrams

The following figure shows length frequency diagrams of Spotted Seatrout collected in 183-m haul seines. All lengths are standard length (SL). Note different scales and years of collection for each estuary. Length-frequency data collected with 183-m haul seines indicate that this gear provides valuable information on multiple life histories of Spotted Seatrout in Florida estuaries (Figure 5.25). Spotted Seatrout length frequency distributions generally followed a bimodal or polymodal distribution across estuaries.

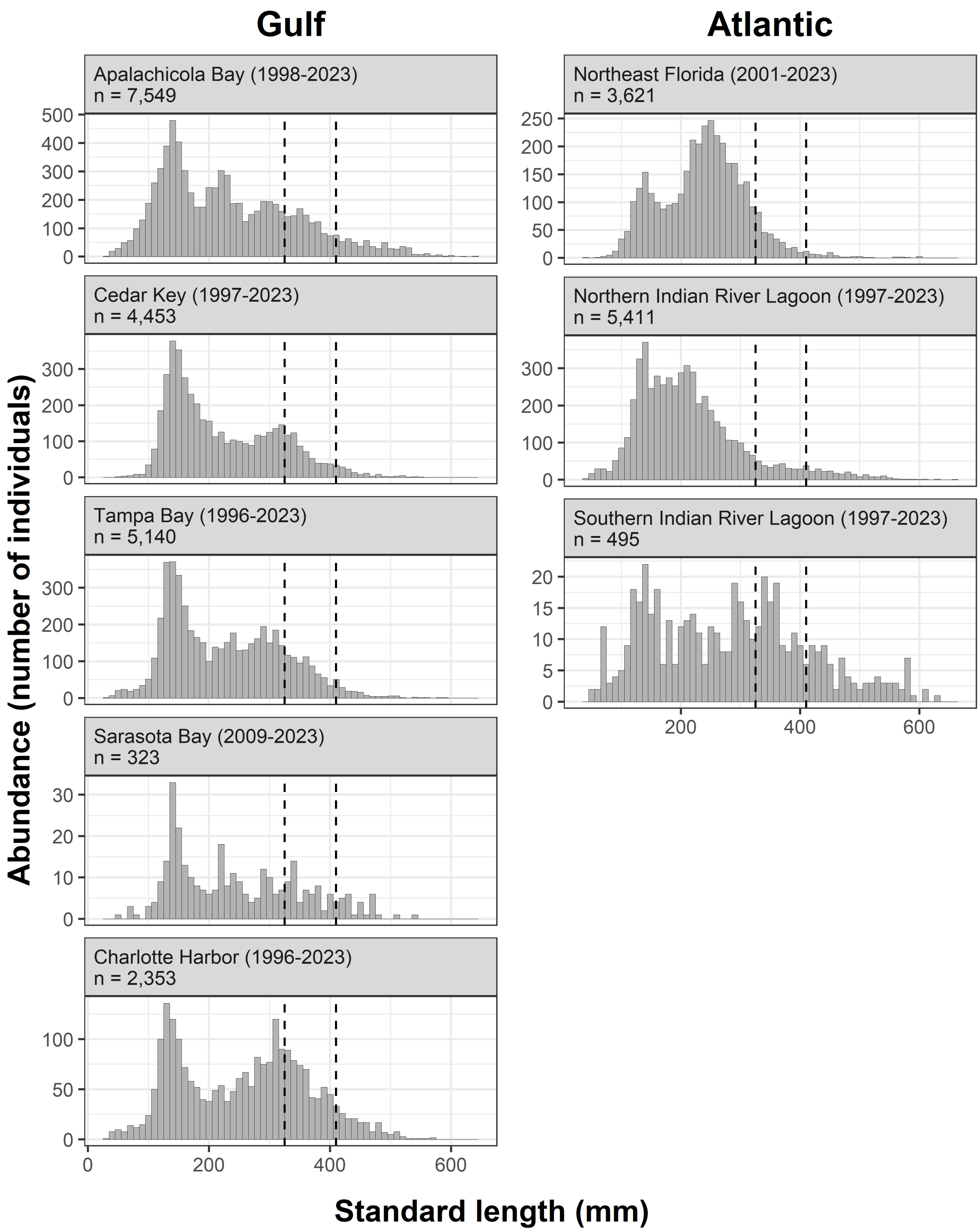

Figure 5.25: Length frequency diagrams of Spotted Seatrout collected in 183-m haul seines. Vertical dashed lines indicate the lower and upper recreational size limits for Spotted Seatrout in each estuary.

5.5 Sheepshead, *Archosargus probatocephalus*

The Sheepshead (*Archosargus probatocephalus*) occurs from Nova Scotia (Gilhen et al. 1976) to Brazil (Caldwell 1965) and is common in coastal waters from the Chesapeake Bay to Texas in the United States (Bigelow and Schroeder 1953). Historically, more Sheepshead have been landed by recreational fishers than by commercial fishers (82–99% of the combined annual landings during 2000–2015) along Florida's Gulf coast (Munyandorero et al. 2017). Sheepshead in Florida waters are currently regulated by minimum size (305 mm total length) and a bag limit (8 fish/day). The most recent stock assessment for Sheepshead used Fisheries-Independent Monitoring (FIM) program data to derive annual indices of abundance (IOAs) during different life history stages to guide coast-specific catch-at-age models (Munyandorero et al. 2017). This stock assessment determined that Sheepshead stocks on the Gulf and Atlantic coasts appeared abundant enough to supply adequate numbers of new recruits while maintaining current harvest rates.

The reproductive season for adult Sheepshead is February through April in Florida waters and the newly recruited young-of-the-year (YOY) are most abundant in shallow estuarine areas between April and June. Regression analyses conducted by FIM for YOY Sheepshead show they reach 40 mm standard length (SL) at approximately 90 days and 130 mm SL at one year of age. Sheepshead in Florida waters enter the fishery at 242 mm SL, which typically corresponds to an age of 3 to 6 years (Dutka-Gianelli and Murie 2001).

To monitor year-class strength and improve the ability to predict future adult Sheepshead abundance, the FIM program developed annual IOAs for two life history stages: YOY and fully recruited to the fishery. Abundance data for YOY (≤40 mm SL) collected in stratified-random 21.3-m seines were examined to assess recruitment in four Florida estuaries: Tampa Bay, Sarasota Bay, Charlotte Harbor, and the northern Indian River Lagoon (IRL). This life history stage was not examined for Apalachicola Bay, Cedar Key, northeast Florida, or southern IRL due to small sample sizes. Young-of-the-year Sheepshead recruited to habitats sampled with 21.3-m seines primarily from April through June. These months were used to define the respective recruitment seasons for each estuary in subsequent analyses. Abundance indices were also calculated for Sheepshead fully recruited to the fishery (≥242 mm SL) for nine Florida estuarine areas: Apalachicola Bay, Cedar Key, Tampa Bay, Sarasota Bay, Charlotte Harbor, northeast Florida, northern Indian River Lagoon, and southern Indian River Lagoon. Data from stratified-random 183-m haul seines were used to develop IOAs for fully recruited Sheepshead from January through December of each year. Due to historical changes in sampling design and available habitat, only consistently sampled zones and habitats (bay or river) in each estuary were included to generate annual IOAs.

Indices of Abundance

The following figures show relative abundance of young-of-the-year Sheepshead (≤40 mm SL) collected in 21.3-m seines and of legal-sized Sheepshead (≥242 mm SL) collected in 183-m haul seines during stratified-random sampling across all estuaries. Points represent an unbiased estimate of the mean abundance (calculated as the median value of the distribution of model estimates), while the vertical bars represent the standard error of the estimate (calculated as the 25th-75th percentiles of model estimates). Note different scales for estimates from 21.3-m and 183-m seines.

Apalachicola Bay

Annual IOAs of fully recruited Sheepshead in Apalachicola Bay did not show a significant trend since 1998 (Figure 5.26). Relative of abundance of fully recruited Sheepshead in 2023 did not differ significantly from the previous year.

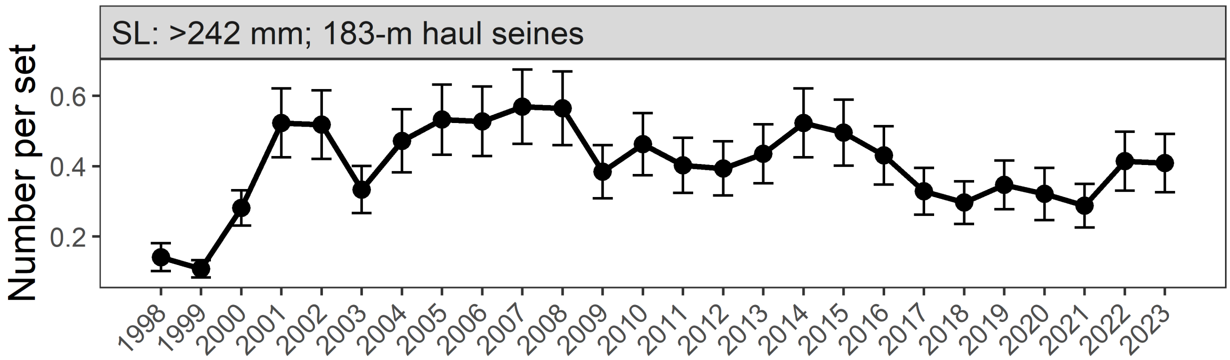

Figure 5.26: Relative abundance of legal-sized Sheepshead collected between 1998 and 2023 during stratified-random sampling of Apalachicola Bay.

Cedar Key

Annual IOAs of fully recruited Sheepshead in Cedar Key have generally decreased since 1997 (Figure 5.27). Relative abundance of fully recruited Sheepshead in 2023 did not differ significantly from the previous year.

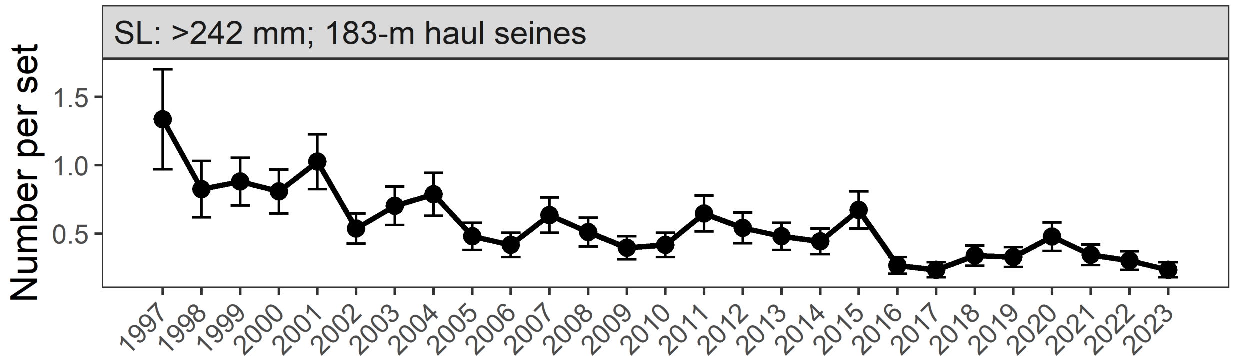

Figure 5.27: Relative abundance of legal-sized Sheepshead collected between 1997 and 2023 during stratified-random sampling of Cedar Key.

Tampa Bay

Annual IOAs of YOY Sheepshead in river habitats of Tampa Bay have generally decreased since 1996 (Figure 5.28). Relative abundance of YOY Sheepshead in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Sheepshead in bay habitats of Tampa Bay did not show a significant trend since 1996 (Figure 5.28). Relative abundance of YOY Sheepshead in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of fully recruited Sheepshead in Tampa Bay did not show a significant trend since 1996 (Figure 5.28). Relative abundance of fully recruited Sheepshead in 2023 did not differ significantly from the previous year.

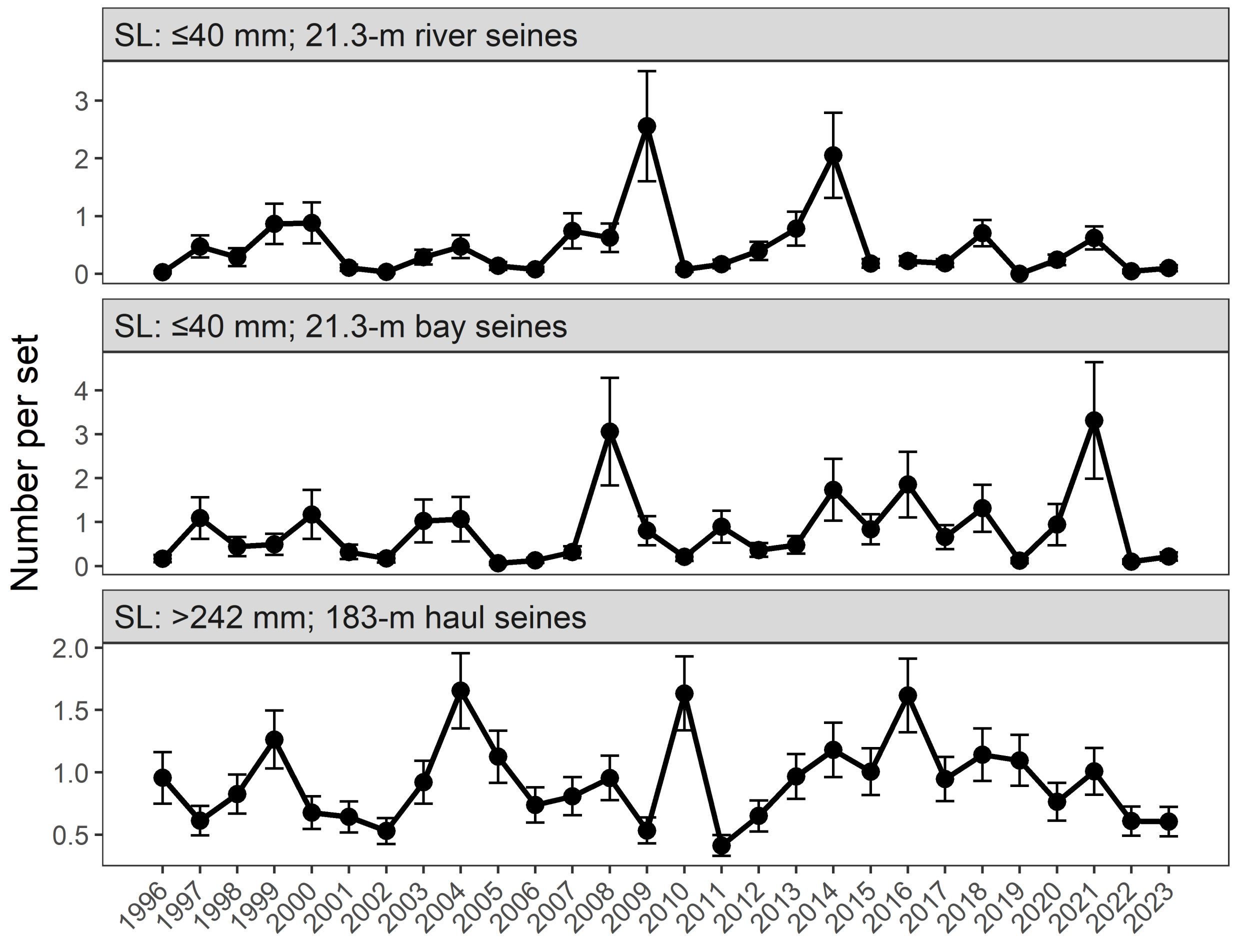

Figure 5.28: Relative abundance of young-of-the-year and legal-sized Sheepshead collected between 1996 and 2023 during stratified-random sampling of Tampa Bay. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Sarasota Bay

Annual IOAs of YOY Sheepshead in bay habitats of Sarasota Bay did not show a significant trend since 2009 (Figure 5.29). Relative abundance of YOY Sheepshead in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of fully recruited Sheepshead in Sarasota Bay have generally increased since 2010 (Figure 5.29). Relative abundance of fully recruited Sheepshead in 2023 did not differ significantly from the previous year.

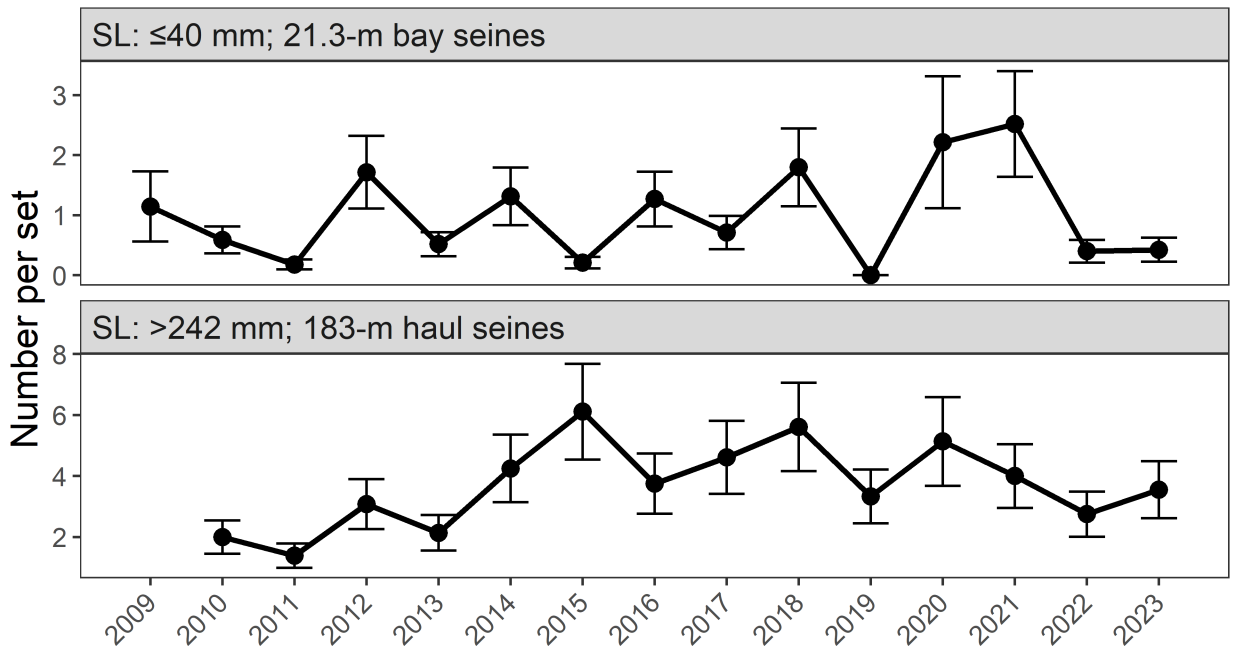

Figure 5.29: Relative abundance of young-of-the-year and legal-sized Sheepshead collected between 2010 and 2023 during stratified-random sampling of Sarasota Bay.

Charlotte Harbor

Annual IOAs of YOY Sheepshead in river habitats of Charlotte Harbor did not show a significant trend since 1996 (Figure 5.30). Relative abundance of YOY Sheepshead in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Sheepshead in bay habitats of Charlotte Harbor did not show a significant trend since 1996 (Figure 5.30). Relative abundance of YOY Sheepshead in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of fully recruited Sheepshead in Charlotte Harbor have generally increased since 1996 (Figure 5.30). Relative abundance of fully recruited Sheepshead in 2023 did not differ significantly from the previous year.

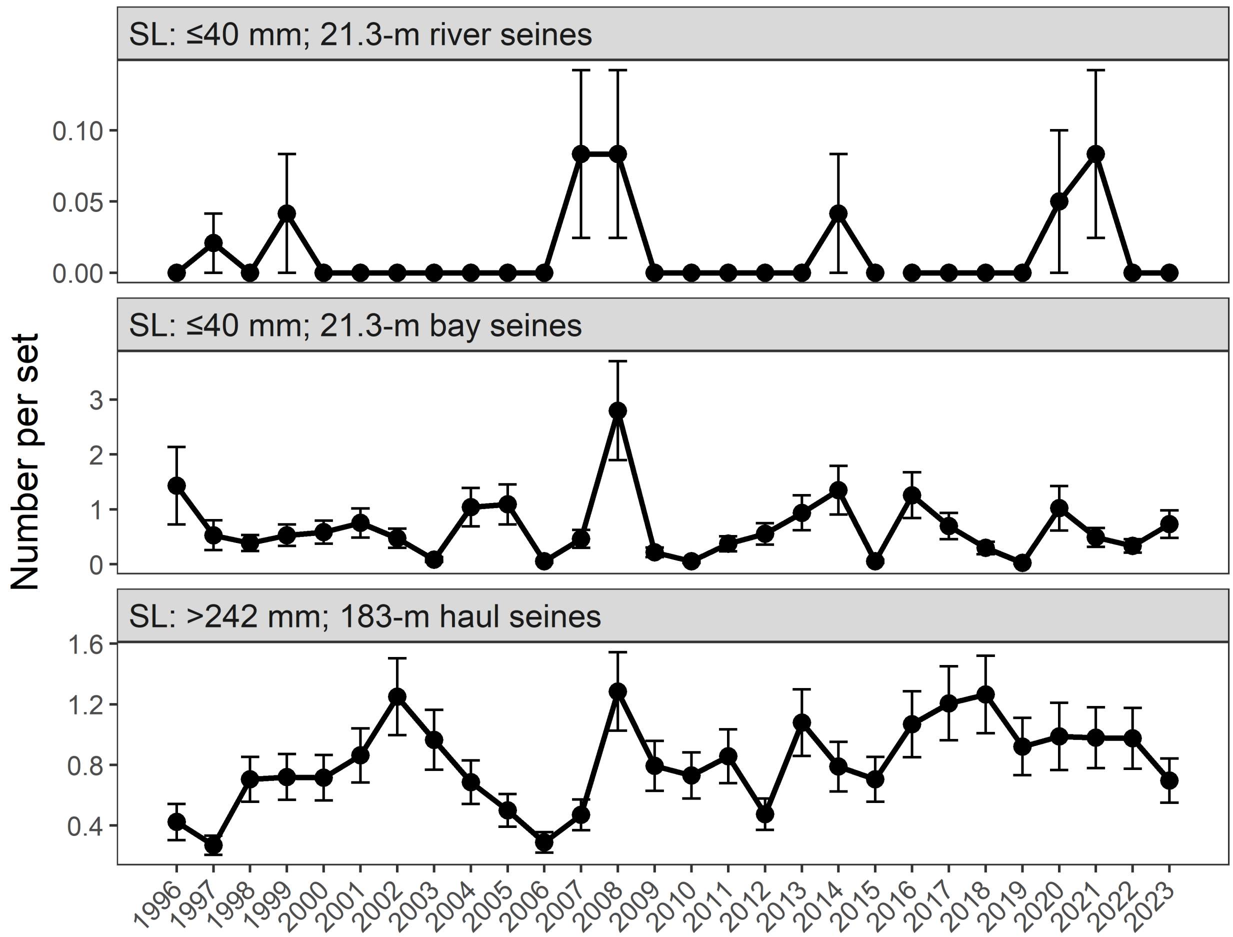

Figure 5.30: Relative abundance of young-of-the-year and legal-sized Sheepshead collected between 1996 and 2023 during stratified-random sampling of Charlotte Harbor. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Northeast Florida

Annual IOAs of fully recruited Sheepshead in Northeast Florida have generally decreased since 2001 (Figure 5.31). Relative abundance of fully recruited Sheepshead in 2023 did not differ significantly from the previous year.

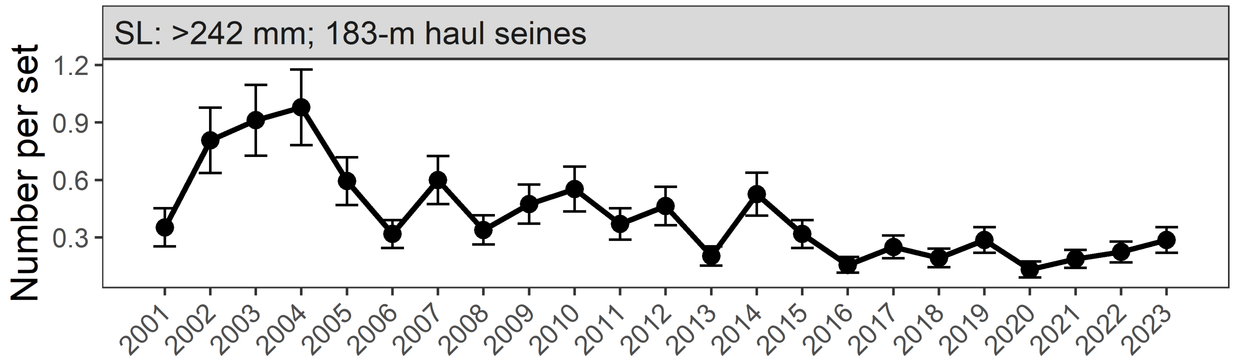

Figure 5.31: Relative abundance of legal-sized Sheepshead collected between 2001 and 2023 during stratified-random sampling of northeast Florida.

Northern Indian River Lagoon

Annual IOAs of YOY Sheepshead in river habitats of the northern Indian River Lagoon did not show a significant trend since 1999 (Figure 5.32). Relative abundance of YOY Sheepshead in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Sheepshead in bay habitats of the northern Indian River Lagoon did not show a significant trend since 1996 (Figure 5.32). Relative abundance of YOY Sheepshead in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of fully recruited Sheepshead in the northern Indian River Lagoon have generally decreased since 1997 (Figure 5.32). Relative abundance of fully recruited Sheepshead abundance in 2023 did not differ significantly from the previous year.

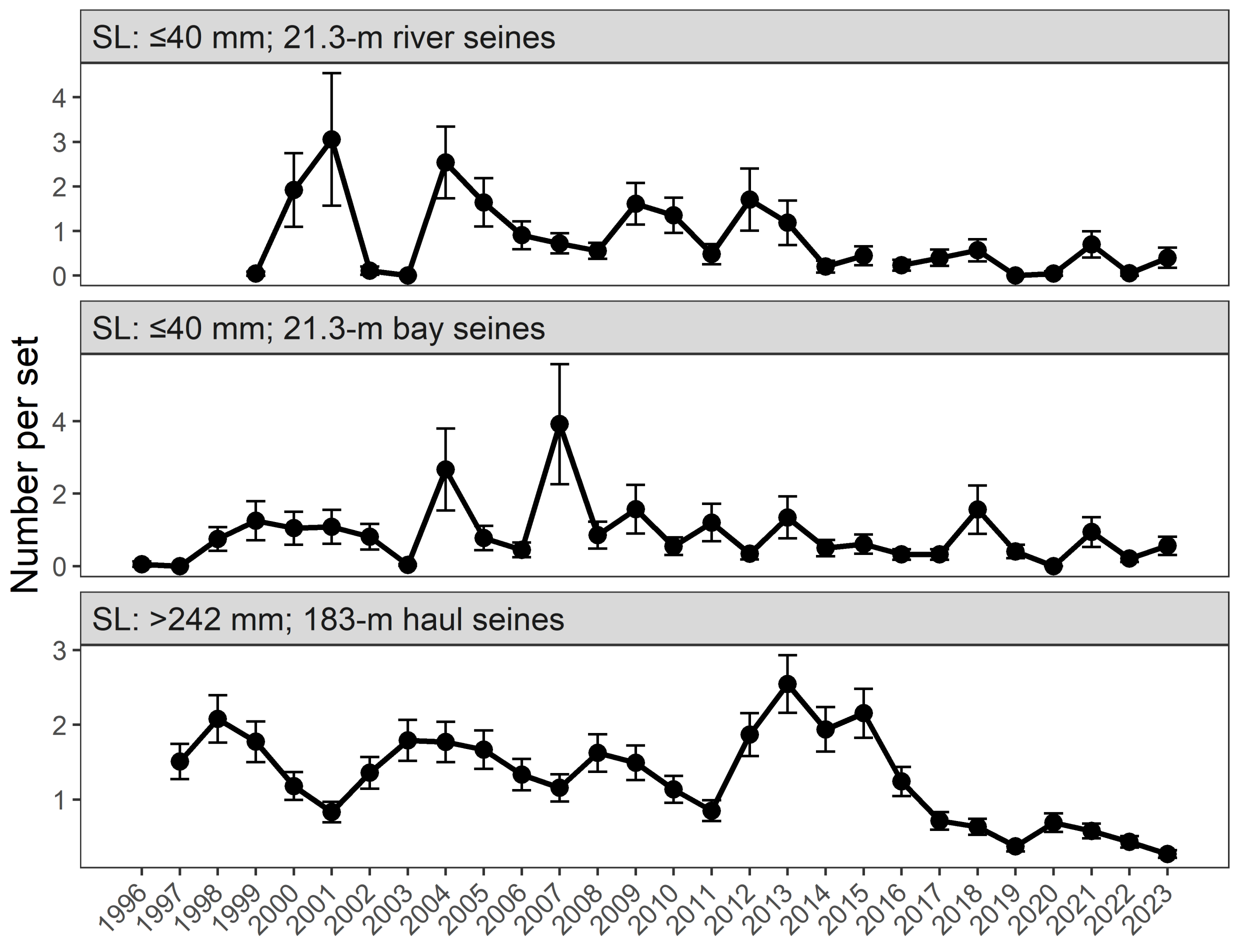

Figure 5.32: Relative abundance of young-of-the-year and legal-sized Sheepshead collected between 1996 and 2023 during stratified-random sampling of the northern Indian River Lagoon. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Southern Indian River Lagoon

Annual IOAs of fully recruited Sheepshead in the southern Indian River Lagoon have generally decreased since 1997 (Figure 5.33). Relative abundance of fully recruited Sheepshead in 2023 did not differ significantly from the previous year.

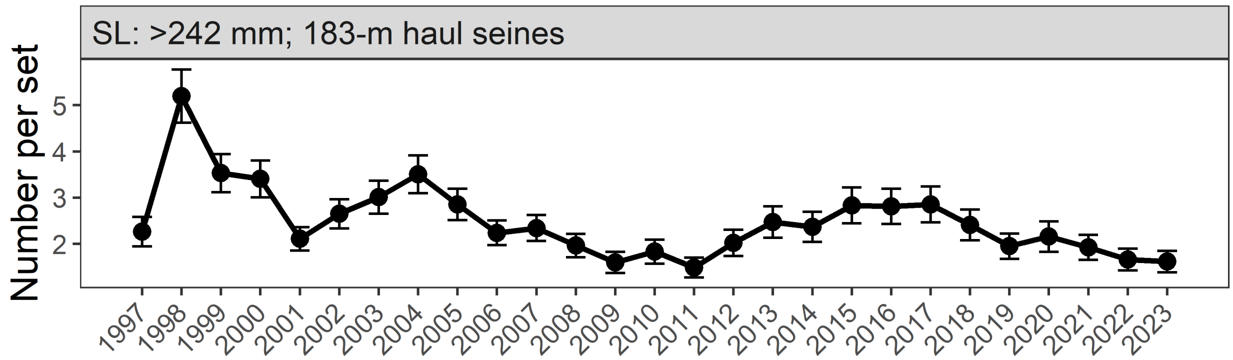

Figure 5.33: Relative abundance of legal-sized Sheepshead collected between 1997 and 2023 during stratified-random sampling of the southern Indian River Lagoon.

Length-Frequency Diagrams

The following figure shows length frequency diagrams of Sheepshead collected in 183-m haul seines. All lengths are standard length (SL). Note different scales and years of collection for each estuary. Length-frequency data collected with 183-m haul seines indicate that this gear provides valuable information on multiple life histories of Sheepshead in Florida estuaries (Figure 5.34). Sheepshead length-frequency distributions varied between unimodal and bimodal among estuaries.

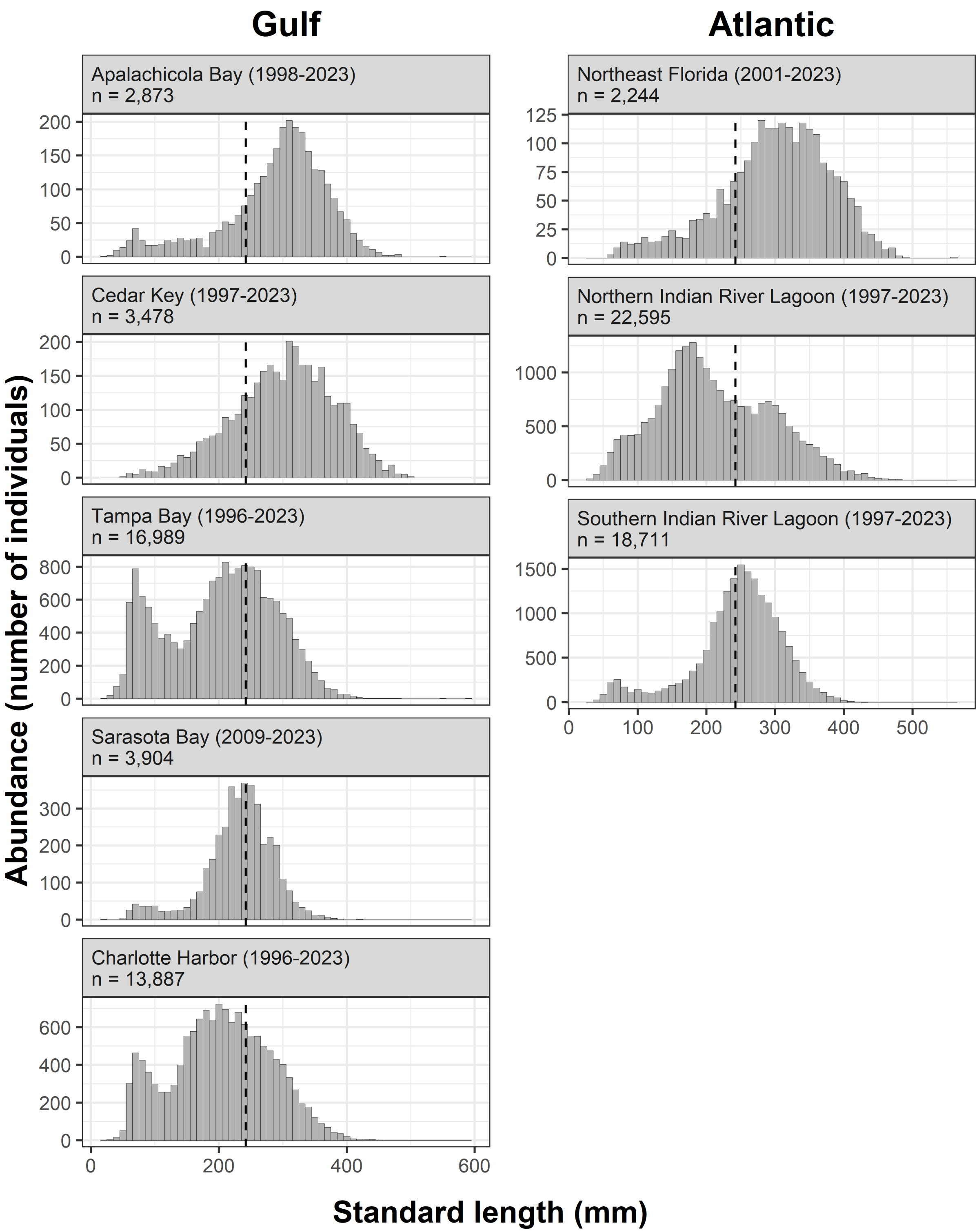

Figure 5.34: Length frequency diagrams of Sheepshead collected in 183-m haul seines. Vertical dashed lines indicate the lower recreational size limits for Sheepshead in each estuary

5.6 Pinfish, *Lagodon rhomboides*

Pinfish, *Lagodon rhomboides*, is an ecologically and recreationally important sparid found in marine and estuarine waters from Massachusetts to Texas (Bigelow and Schroeder 1953; Caldwell 1957). It is one of the most abundant resident species in estuaries of the northeastern Gulf of Mexico (Hoese and Jones 1963; Hansen 1969; Ogren and Brusher 1977). Densities of Pinfish have been found to be positively correlated to seagrass and drift algae cover (Rydene and Matheson 2003; Faletti et al. 2019). Studies have shown that predation by Pinfish plays a role in the organization of seagrass macro benthic faunal assemblages (Young et al. 1976; Young and Young 1977). Pinfish are 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 represent a large percentage of the offshore movement of nearshore nutrients and carbon to reef fish stocks in the Gulf of Mexico (Nelson et al. 2013). Pinfish of all sizes are commonly targeted by anglers for use as bait for recreationally important species such as Sailfish (*Istiophorus platypterus*), Red Drum (*Sciaenops ocellatus*), Spotted Seatrout (*Cynoscion nebulosus*), Southern Flounder (*Paralichthys lethostigma*), Common Snook (*Centropomus undecimalis*), and Gag Grouper (*Mycteroperca microlepis*).

To monitor year-class strength and improve the ability to predict future Pinfish abundances, indices of relative abundance (IOAs) were developed for young-of-the-year (YOY) Pinfish recruitment into selected Florida estuaries. Abundance data for YOY Pinfish (≤80 mm SL) that were collected in stratified-random 21.3-m seine samples were examined to assess recruitment into eight Florida estuaries: Apalachicola Bay, Cedar Key, Tampa Bay, Sarasota Bay, Charlotte Harbor, northeast Florida, northern Indian River Lagoon, and southern Indian River Lagoon. Young-of-the-year Pinfish recruited to habitats sampled with 21.3-m seines primarily from January through June and IOAs were calculated using catch data from these months only. This time period coincides with the published recruitment period for this species (Nelson 1998). The maximum size that individuals of YOY cohorts attain by June is 80 mm SL (Nelson 1998). Data from stratified-random 183-m haul seines were used to develop IOAs for subadult/adult fish (≥100 mm SL) collected throughout the year for eight Florida estuaries: Apalachicola Bay, Cedar Key, Tampa Bay, Sarasota Bay, Charlotte Harbor, northeast Florida, northern Indian River Lagoon, and southern Indian River Lagoon. All IOAs were calculated using data beginning in 1996, however estuaries varied in the specific time period sampled. Due to historical changes in sampling design and available habitat, only consistently sampled zones and habitats (bay or river) in each estuary were included to generate annual IOAs.

Indices of Abundance

The following figures show relative abundance of young-of-the-year Pinfish (≤80 mm SL) collected in 21.3-m seines and of subadult and adult Pinfish (>100 mm SL) collected in 183-m haul seines during stratified-random sampling across all estuaries. Points represent an unbiased estimate of the mean abundance (calculated as the median value of the distribution of model estimates), while the vertical bars represent the standard error of the estimate (calculated as the 25th-75th percentiles of model estimates). Note different scales for estimates from 21.3-m and 183-m seines.

Apalachicola Bay

Annual IOAs of YOY Pinfish in bay habitats of Apalachicola Bay did not show a significant trend since 1998 (Figure 5.35). Relative abundance of YOY Pinfish in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of subadult and adult Pinfish in Apalachicola Bay did not show a significant trend since 1998 (Figure 5.35). Relative abundance of subadult and adult Pinfish in 2023 did not differ significantly from the previous year.

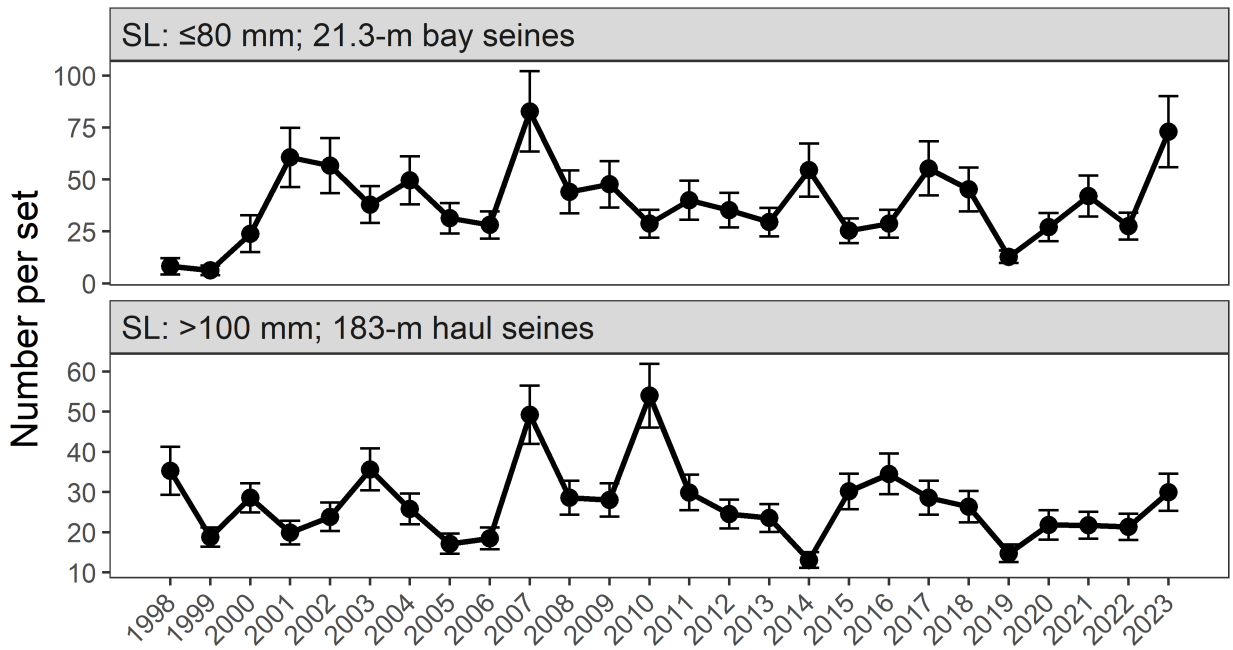

Figure 5.35: Relative abundance of young-of-the-year and subadult/adult Pinfish collected between 1998 and 2023 during stratified-random sampling of Apalachicola Bay.

Cedar Key

Annual IOAs of YOY Pinfish in river habitats of Cedar Key did not show a significant trend since 1996 (Figure 5.36). Relative abundance of YOY Pinfish in river habitats in 2023 increased from the previous year.

Annual IOAs of YOY Pinfish in bay habitats of Cedar Key did not show a significant trend since 1996 (Figure 5.36). Relative abundance of YOY Pinfish in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of subadult and adult Pinfish in Cedar Key have generally decreased since 1997 (Figure 5.36). Relative abundance of subadult and adult Pinfish in 2023 did not differ significantly from the previous year.

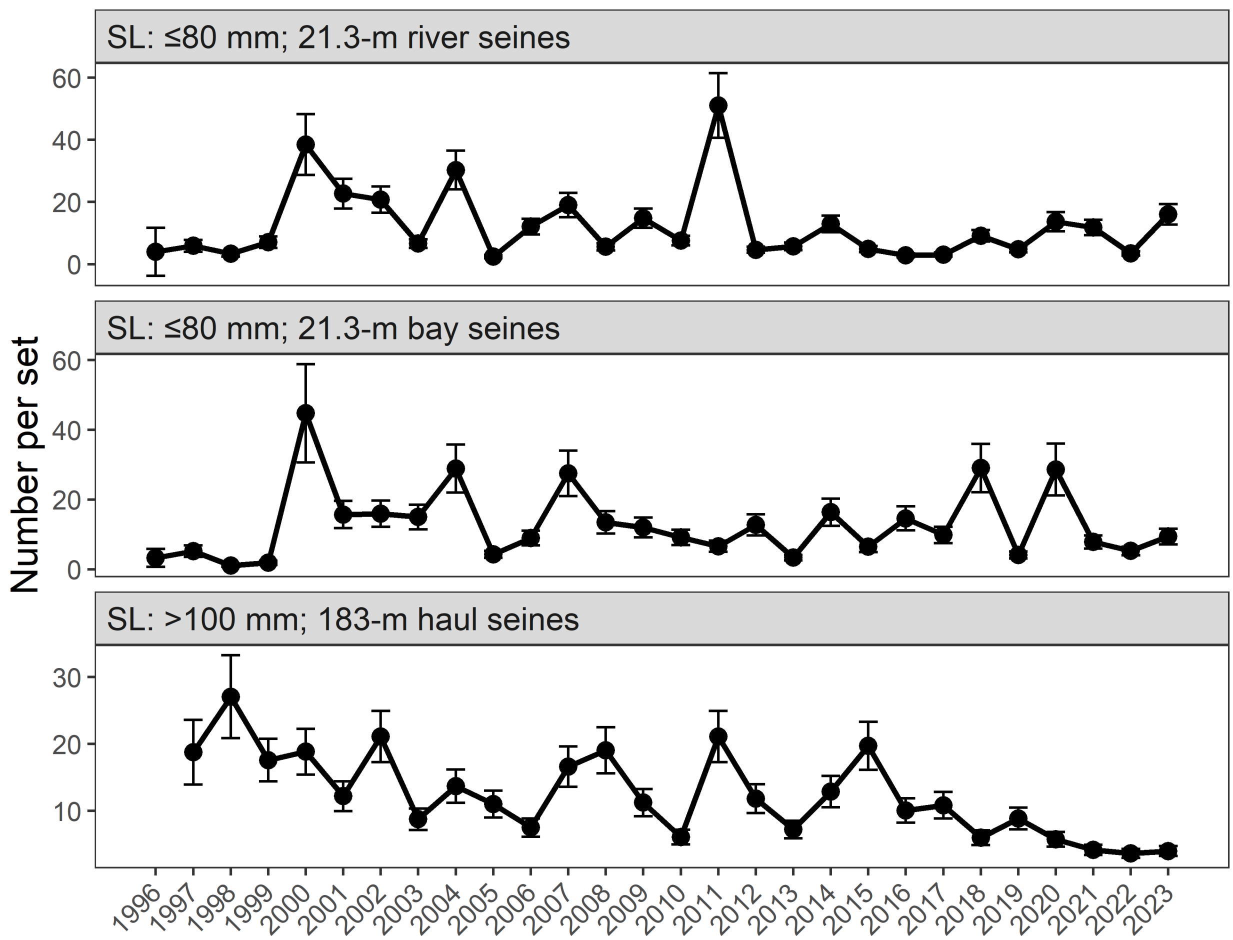

Figure 5.36: Relative abundance of young-of-the-year and subadult/adult Pinfish collected between 1996 and 2023 during stratified-random sampling of Cedar Key.

Tampa Bay

Annual IOAs of YOY Pinfish in river habitats of Tampa Bay have generally decreased since 1996 (Figure 5.37). Relative abundance of YOY Pinfishin river habitats in 2023 increased from the previous year.

Annual IOAs of YOY Pinfish in bay habitats of Tampa Bay did not show a significant trend since 1996 (Figure 5.37). Relative abundance of YOY Pinfish in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of subadult and adult Pinfish in Tampa Bay have generally increased since 1996 (Figure 5.37). Relative abundance of subadult and adult Pinfish in 2023 did not differ significantly from the previous year.

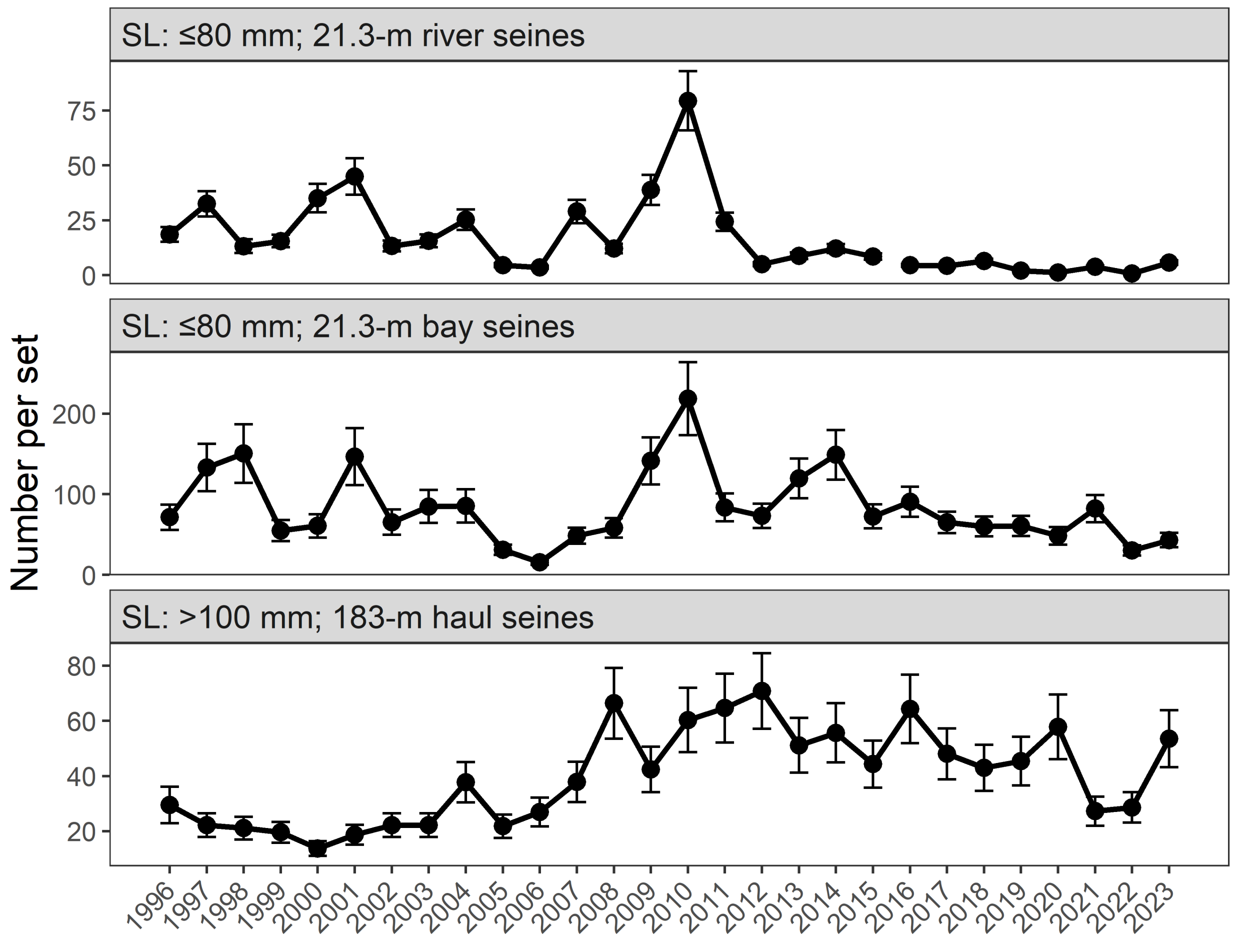

Figure 5.37: Relative abundance of young-of-the-year and subadult/adult Pinfish collected between 1996 and 2023 during stratified-random sampling of Tampa Bay. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Sarasota Bay

Annual IOAs of YOY Pinfish in bay habitats of Sarasota Bay have generally decreased since 2009 (Figure 5.38). Relative abundance of YOY Pinfish in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of subadult and adult Pinfish in Sarasota Bay did not show a significant trend since 2010 (Figure 5.38). Relative abundance of subadult and adult Pinfish in 2023 did not differ significantly from the previous year.

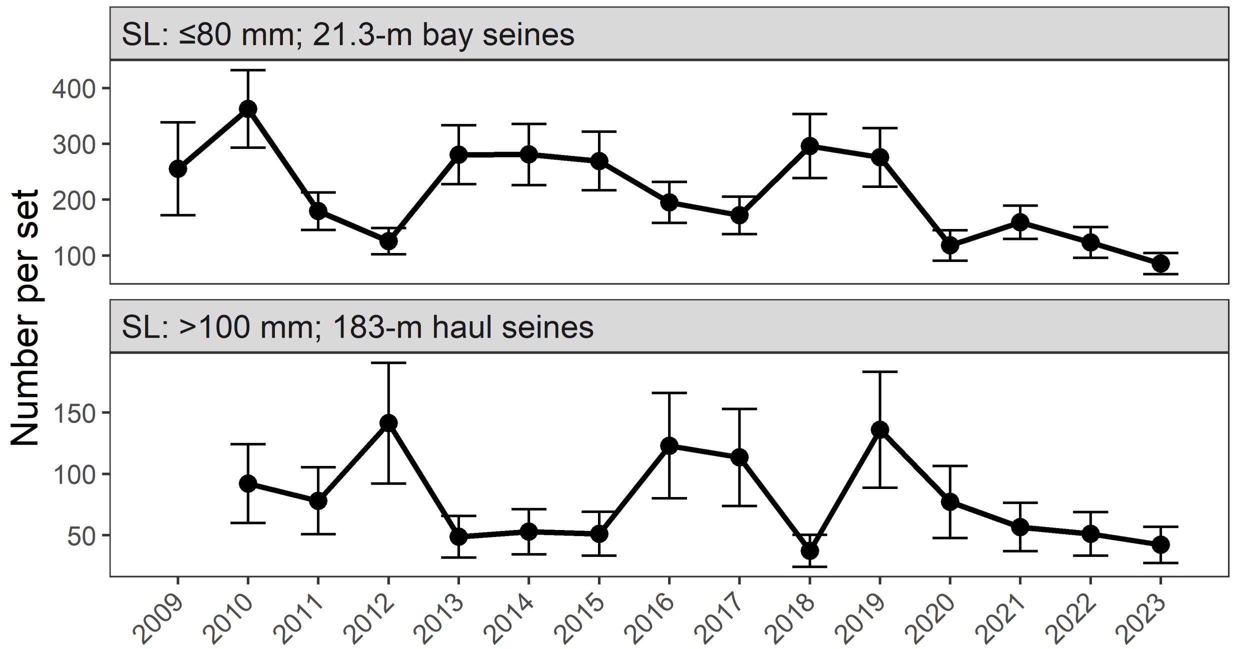

Figure 5.38: Relative abundance of young-of-the-year and subadult/adult Pinfish collected between 2009 and 2023 during stratified-random sampling of Sarasota Bay.

Charlotte Harbor

Annual IOAs of YOY Pinfish in river habitats of Charlotte Harbor have generally decreased since 1996 (Figure 5.39). Relative abundance of YOY Pinfish in river habitats in 2023 decreased from the previous year.

Annual IOAs of YOY Pinfish in bay habitats of Charlotte Harbor did not show a significant trend since 1996 (Figure 5.39). Relative abundance of YOY Pinfish in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of subadult and adult Pinfish in Charlotte Harbor have generally increased since 1996 (Figure 5.39). Relative abundance of subadult and adult Pinfish in 2023 did not differ significantly from the previous year.

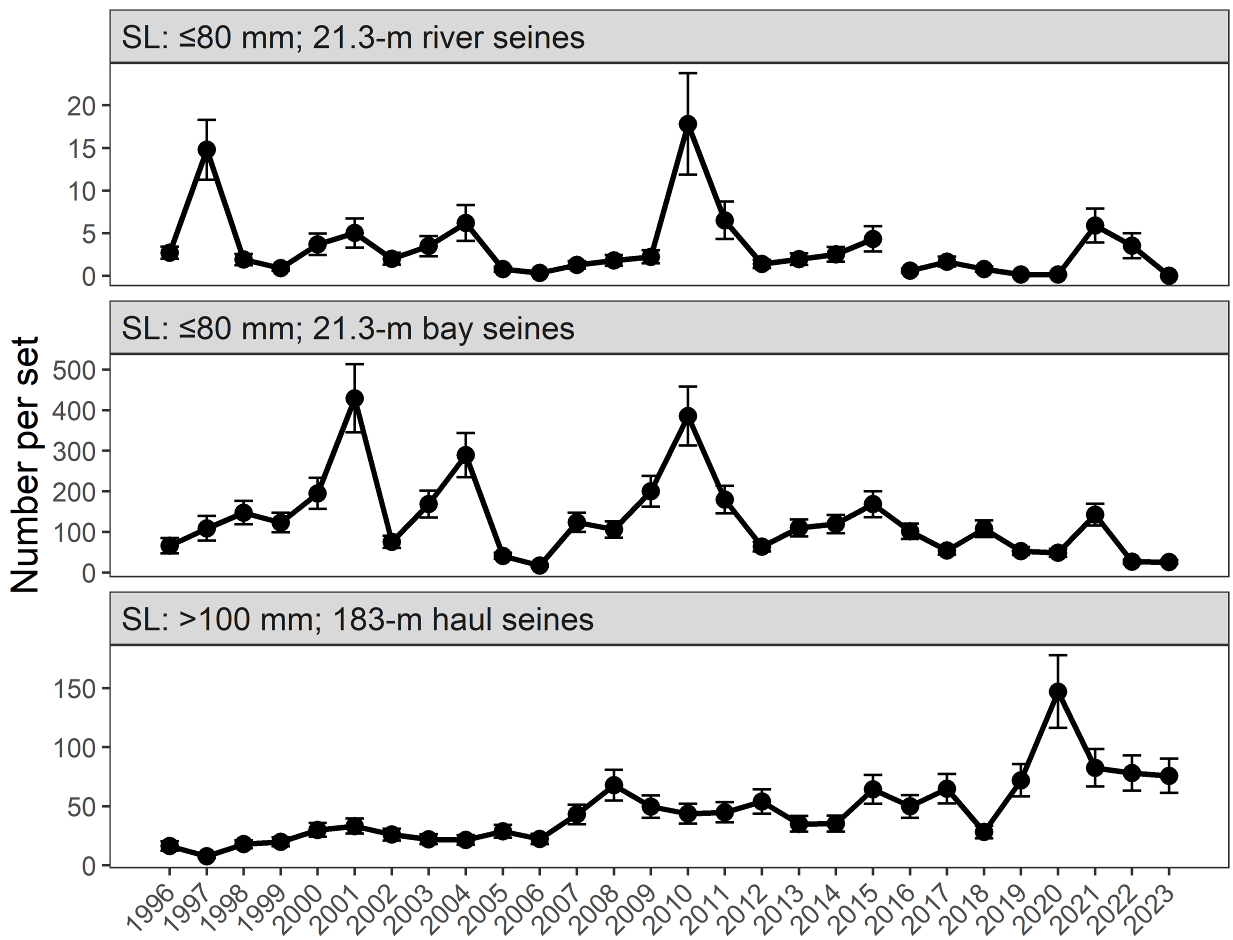

Figure 5.39: Relative abundance of young-of-the-year and subadult/adult Pinfish collected between 1996 and 2023 during stratified-random sampling of Charlotte Harbor. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Northeast Florida

Annual IOAs of YOY Pinfish in river habitats of Northeast Florida did not show a significant trend since 2001 (Figure 5.40). Relative abundance of YOY Pinfish in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of subadult and adult Pinfish in Northeast Florida have generally decreased since 2001 (Figure 5.40). Relative abundance of subadult and adult Pinfish in 2023 did not differ significantly from the previous year.

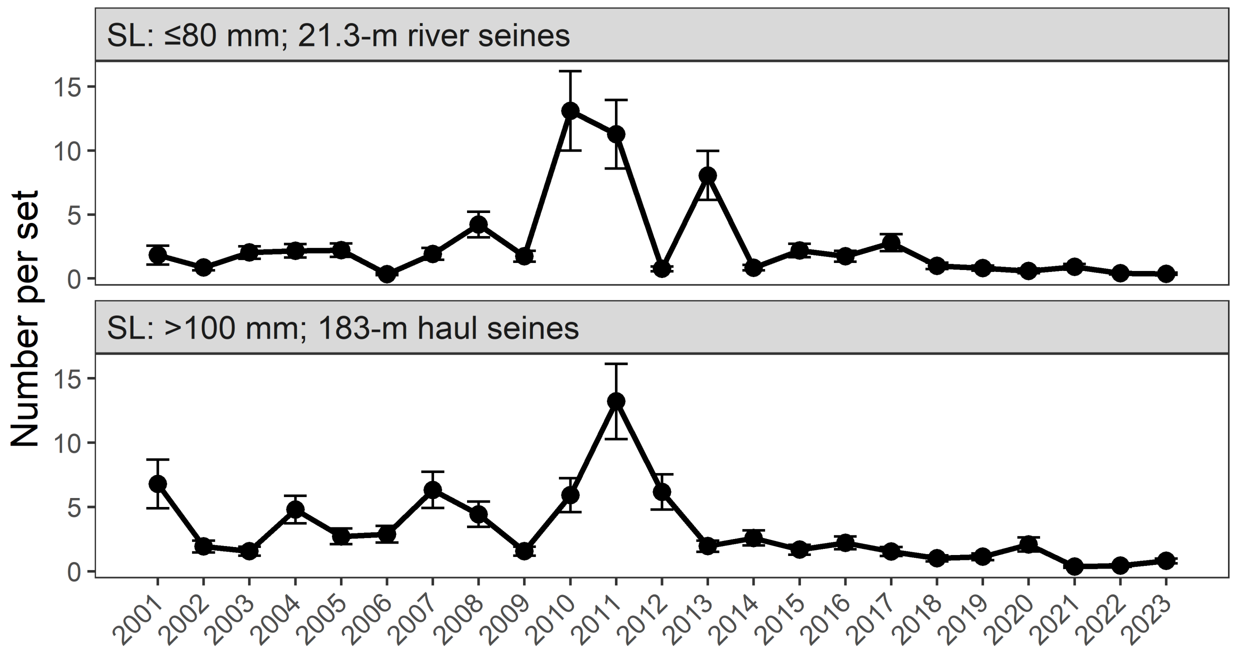

Figure 5.40: Relative abundance of young-of-the-year and subadult/adult Pinfish collected between 2001 and 2023 during stratified-random sampling of northeast Florida.

Northern Indian River Lagoon

Annual IOAs of YOY Pinfish in river habitats of the northern Indian River Lagoon did not show a significant trend since 1999 (Figure 5.41). Relative abundance of YOY Pinfish in river habitats in 2023 decreased from the previous year.

Annual IOAs of YOY Pinfish in bay habitats of the northern Indian River Lagoon did not show a significant trend since 1996 (Figure 5.41). Relative abundance of YOY Pinfish in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of subadult and adult Pinfish in the northern Indian River Lagoon have generally decreased since 1997 (Figure 5.41). Relative abundance of subadult and adult Pinfish in 2023 decreased from the previous year.

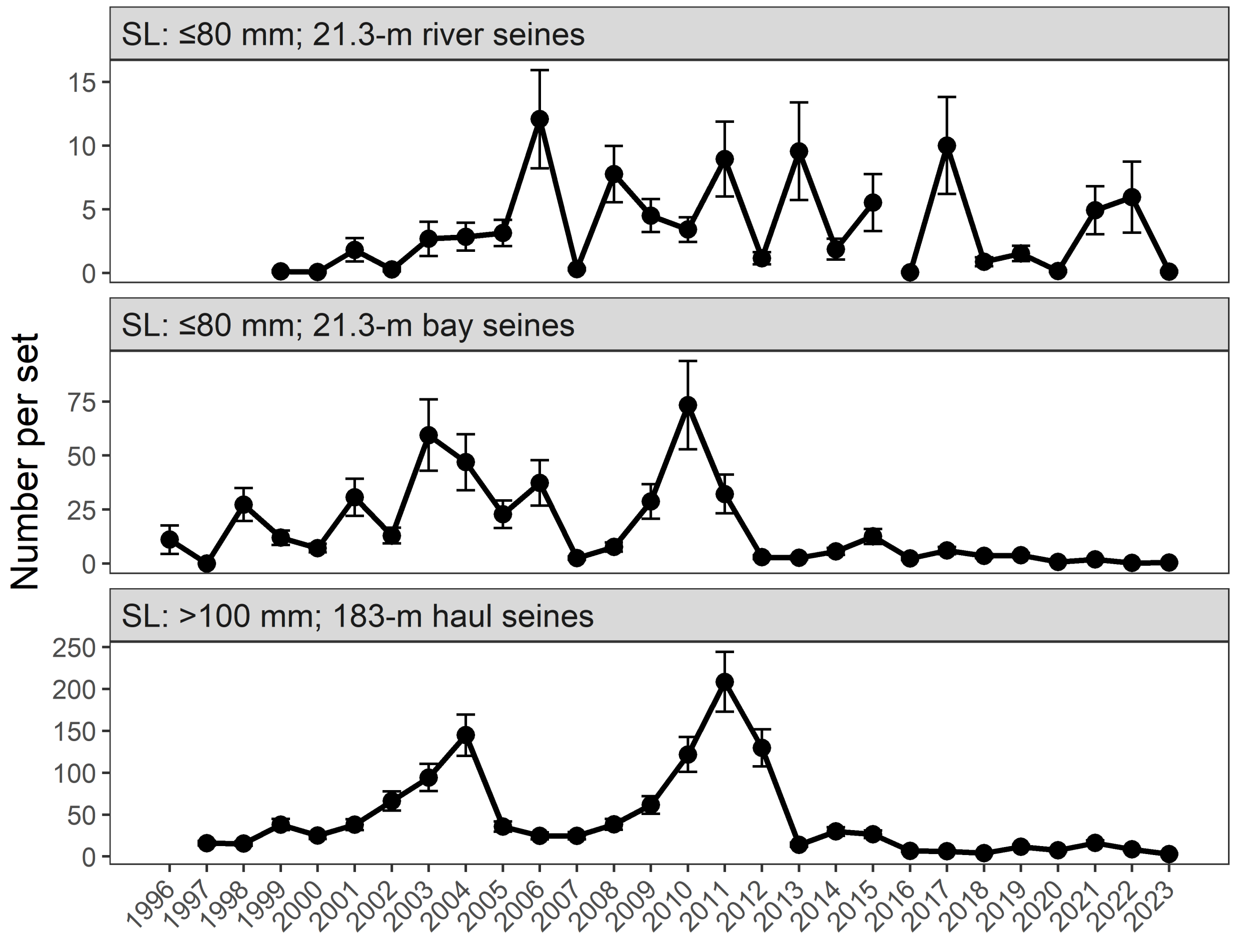

Figure 5.41: Relative abundance of young-of-the-year and subadult/adult Pinfish collected between 1996 and 2023 during stratified-random sampling of the northern Indian River Lagoon. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Southern Indian River Lagoon

Annual IOAs of YOY Pinfish in river habitats of the southern Indian River Lagoon did not show a significant trend since 2016 (Figure 5.42). Relative abundance of YOY Pinfish in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of subadult and adult Pinfish in the southern Indian River Lagoon have generally decreased since 1997 (Figure 5.42). Relative abundance of subadult and adult Pinfish in 2023 increased from the previous year.

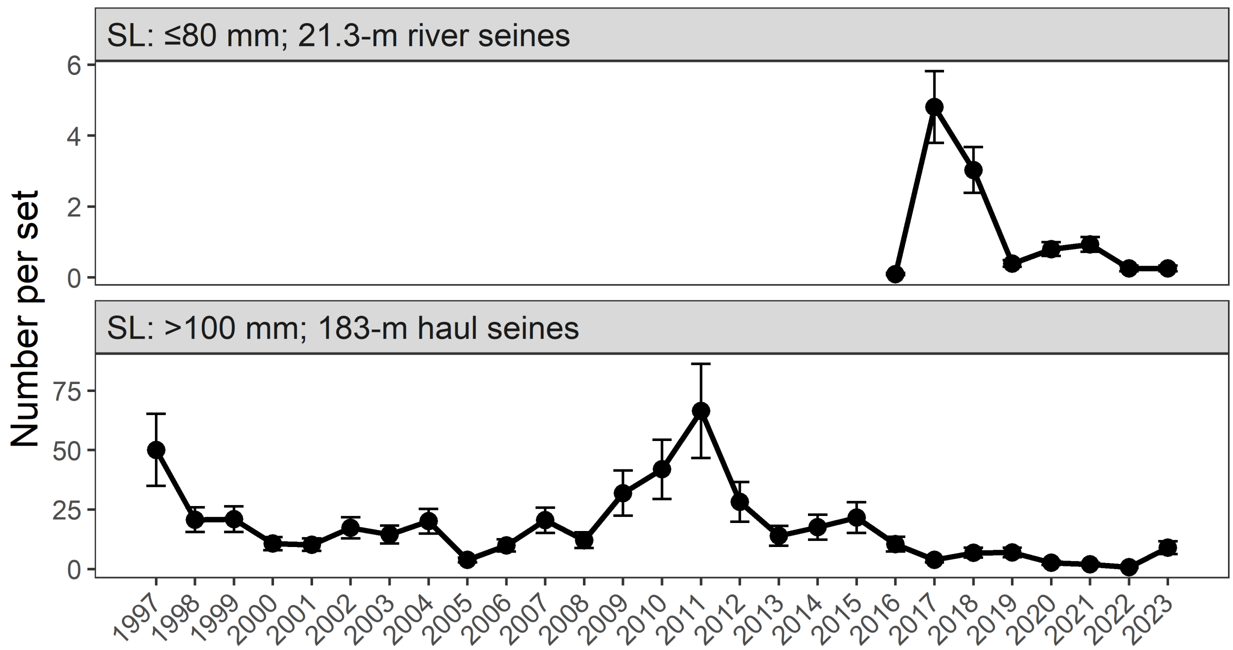

Figure 5.42: Relative abundance of young-of-the-year and subadult/adult Pinfish collected between 1997 and 2023 during stratified-random sampling of the southern Indian River Lagoon. Note that river sampling began in 2016 to include previously underrepresented habitats (i.e., tidal creeks and tributaries).

Length-Frequency Diagrams

The following figure shows length frequency diagrams of Pinfish collected in 183-m haul seines. All lengths are standard length (SL). Note different scales and years of collection for each estuary. Length-frequency data collected with 183-m haul seines indicate that this gear provides valuable information on subadult and adult Pinfish in Florida estuaries (Figure 5.43). Pinfish length-frequency distributions generally followed a unimodal-to-bimodal distribution across estuaries.

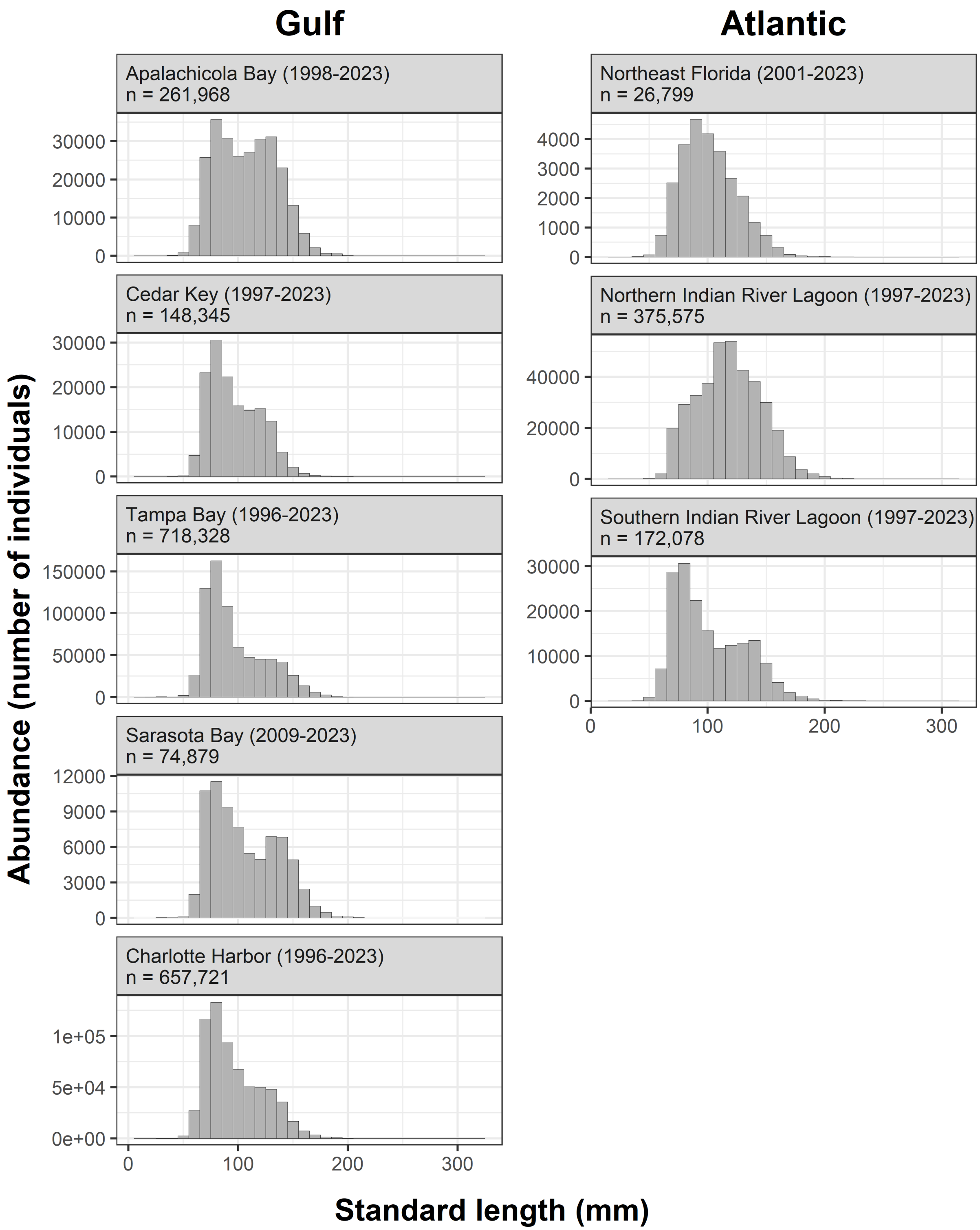

Figure 5.43: Length frequency diagrams of Pinfish collected in 183-m haul seines.

5.7 Striped Mullet, *Mugil cephalus*

Striped Mullet, *Mugil cephalus*, are one of Florida's most abundant and widespread estuarine-dependent fishes (Odum 1970; Leard et al. 1995). Striped Mullet supported a valuable commercial fishery from the early 1960s through the early 1990s, with approximately 90% of all U.S. landings occurring in the Gulf of Mexico (Gulf) and over 80% of all commercial landings occurring in Florida waters (Rivas 1980; Leard et al. 1995; Mahmoudi 1997). From 1930 to 1993 Florida Gulf coast landings averaged 26 million pounds annually (Chagaris et al. 2014). Changes were documented from 1991 to 1994 when commercial Striped Mullet landings in Florida severely declined from 79% to 46% of the total Gulf production (Leard et al. 1995). Following the implementation of the Florida net limitation referendum (July 1, 1995), which eliminated the use of entangling nets within three miles of the Atlantic coast and nine miles of the Gulf coast, Striped Mullet commercial landings were further reduced to approximately 5 million pounds (Mahmoudi 2005). After an initial decline in fishing effort and landings following the net limitation referendum, fishing effort and landings in Florida waters have gradually increased to approximately 8 million pounds annually. Due to substantial declines in fishing mortality rates since the net limitation, overall stock size and spawning stock biomass have increased significantly. Stocks throughout the state of Florida are healthy, and current levels of fishing effort appear to be sustainable (Chagaris et al. 2014).

Striped Mullet form large schools in estuarine and nearshore waters from October to December. These schools then migrate to offshore spawning areas over the outer continental shelf and slope during the passage of weather fronts from October through February. Typically, young-of-the-year (YOY) Striped Mullet recruit to Florida's estuaries at 20 to 35 mm standard length (SL, Kilby 1948; Futch 1966). Recruitment usually begins in January and continues through April, with peaks in abundance during February and March; however, previous analyses of length-frequency data indicated that recruitment has occurred in Florida's estuaries as early as the end of December.

To monitor year-class strength and to improve the ability to predict future adult Striped Mullet abundances, relative indices of abundance (IOAs) were developed for YOY Striped Mullet recruitment into selected Florida estuaries. Abundance data for YOY Striped Mullet (≤35 mm SL) that were collected in stratified-random 21.3-m seine samples were examined to assess recruitment into six Florida estuaries: Apalachicola Bay, Cedar Key, Tampa Bay, Charlotte Harbor, northeast Florida, the northern Indian River Lagoon, and southern Indian River Lagoon. Young-of-the-year Striped Mullet recruited to habitats sampled with 21.3-m seines primarily from January to March. Therefore, these specific months were used to define the respective recruitment seasons for each estuary in subsequent analyses. Separate analyses for river and bay sets were conducted when possible to examine differences in recruitment between the two habitats. Indices were not calculated for estuaries where 21.3-m seines were not deployed or where limited data were available. Subadult and adult and Striped Mullet are occasionally caught in 183-m seines; however, due to the unique behavior of these fish, we do not report IOAs for this life stage here as catches are not indicative of a representative sample. Due to historical changes in sampling design and available habitat, only consistently sampled zones and habitats (bay or river) in each estuary were included to generate annual IOAs.

Indices of Abundance

The following figures show relative abundance of young-of-the-year Striped Mullet (≤35 mm SL) collected in 21.3-m seines during stratified-random sampling across all estuaries. Points represent an unbiased estimate of the mean abundance (calculated as the median value of the distribution of model estimates), while the vertical bars represent the standard error of the estimate (calculated as the 25th-75th percentiles of model estimates).

Apalachicola Bay

Annual IOAs of YOY Striped Mullet in bay habitats of Apalachicola Bay have generally increased since 1998 (Figure 5.44). Relative abundance of YOY Striped Mullet in bay habitats in 2023 did not differ significantly from the previous year.

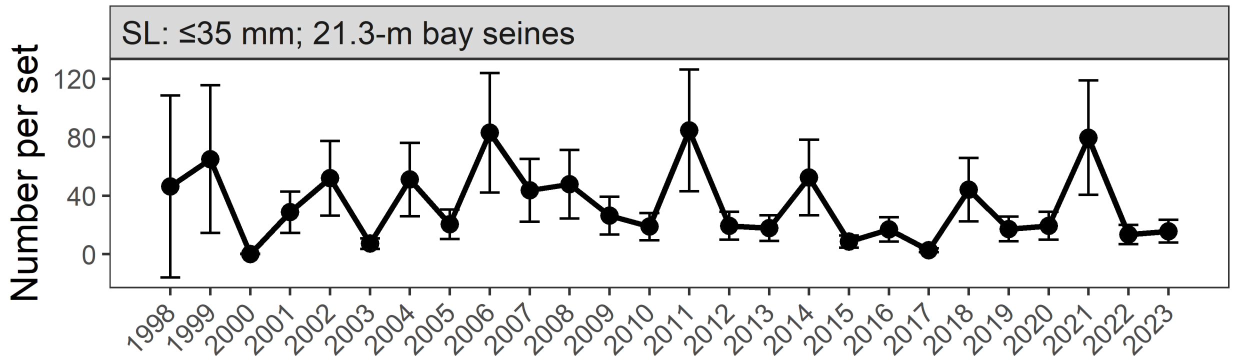

Figure 5.44: Relative abundance of young-of-the-year Striped Mullet collected between 1998 and 2023 during stratified-random sampling of Apalachicola Bay.

Cedar Key

Annual IOAs of YOY Striped Mullet in river habitats of Cedar Key did not show a significant trend since 1997 (Figure 5.45). Relative abundance of YOY Striped Mullet in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Striped Mullet in bay habitats of Cedar Key did not show a significant trend since 1997 (Figure 5.45). Relative abundance of YOY Striped Mullet in bay habitats in 2023 did not differ significantly from the previous year.

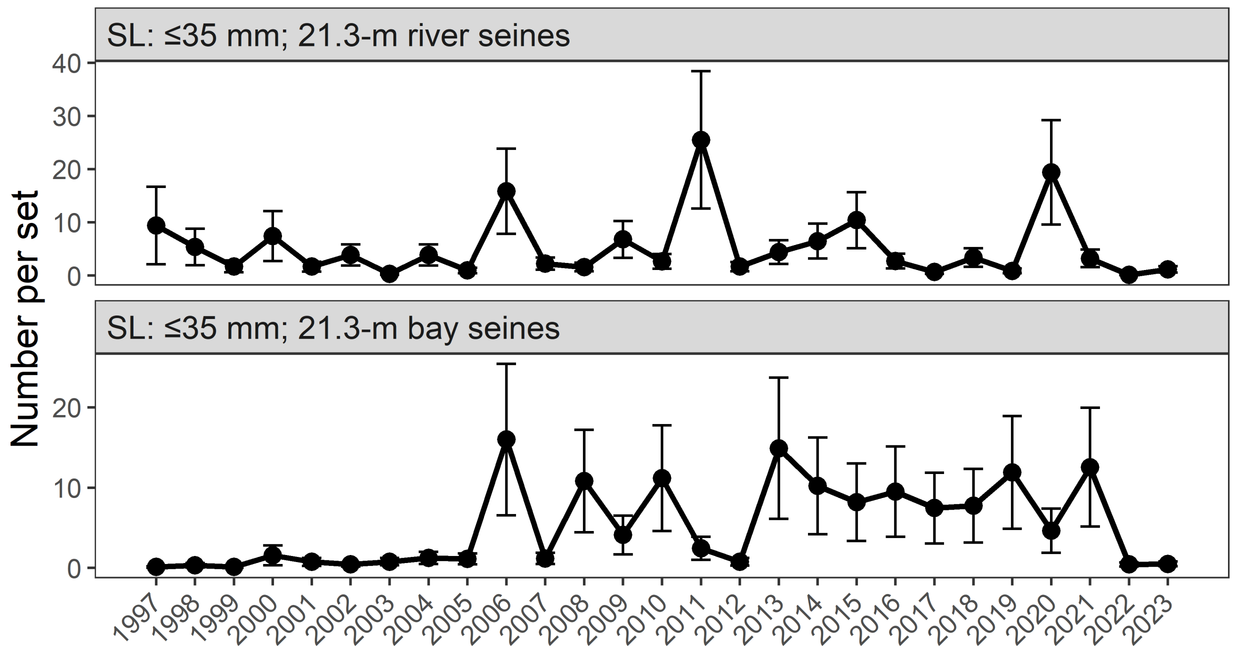

Figure 5.45: Relative abundance of young-of-the-year Striped Mullet collected between 1997 and 2023 during stratified-random sampling of Cedar Key.

Tampa Bay

Annual IOAs of YOY Striped Mullet in river habitats of Tampa Bay did not show a significant trend since 1996 (Figure 5.46). Relative abundance of YOY Striped Mullet in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Striped Mullet in bay habitats of Tampa Bay did not show a significant trend since 1996 (Figure 5.46). Relative abundance of YOY Striped Mullet in bay habitats in 2023 did not differ significantly from the previous year.

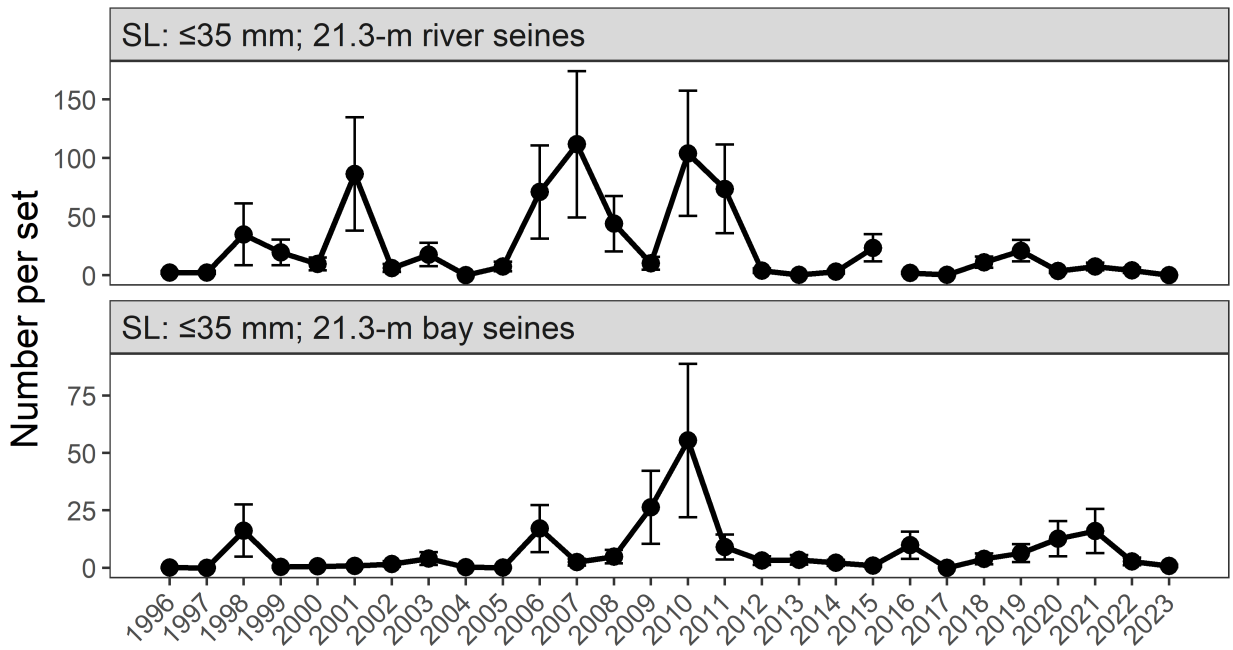

Figure 5.46: Relative abundance of young-of-the-year Striped Mullet collected between 1996 and 2023 during stratified-random sampling of Tampa Bay. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Charlotte Harbor

Annual IOAs of YOY Striped Mullet in river and tidal creek habitats of Charlotte Harbor did not show a significant trend since 1996 (Figure 5.47). Relative abundance of YOY Striped Mullet in river and tidal creek habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Striped Mullet in bay habitats of Charlotte Harbor did not show a significant trend since 1996 (Figure 5.47). Relative abundance of YOY Striped Mullet in bay habitats in 2023 did not differ significantly from the previous year.

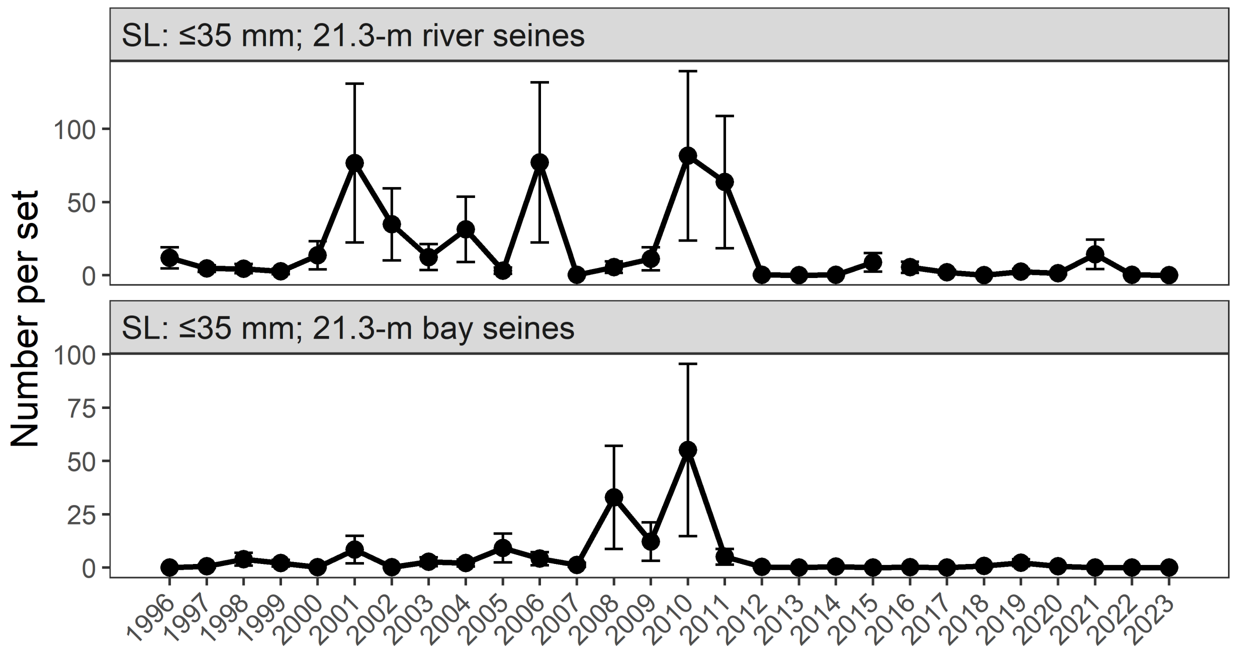

Figure 5.47: Relative abundance of young-of-the-year Striped Mullet collected between 1996 and 2023 during stratified-random sampling of Charlotte Harbor. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Northeast Florida

Annual IOAs of YOY Striped Mullet in river habitats of Northeast Florida did not show a significant trend since 2002 (Figure 5.48). Relative abundance of YOY Striped Mullet in river habitats in 2023 did not differ significantly from the previous year.

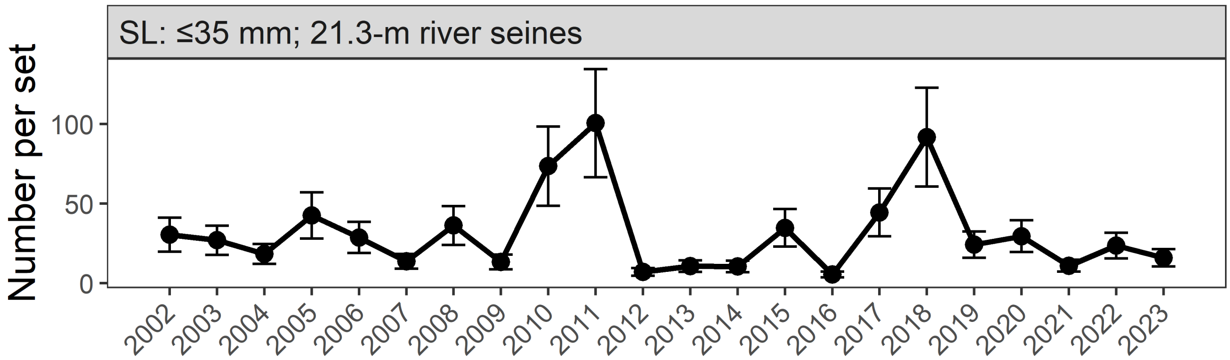

Figure 5.48: Relative abundance of young-of-the-year Striped Mullet collected between 2002 and 2023 during stratified-random sampling of northeast Florida.

Northern Indian River Lagoon

Annual IOAs of YOY Striped Mullet in river habitats of the Northern Indian River Lagoon did not show a significant trend since 1999 (Figure 5.49). Relative abundance of YOY Striped Mullet in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Striped Mullet in bay habitats of the Northern Indian River Lagoon have generally increased since 1996 (Figure 5.49). Relative abundance of YOY Striped Mullet in bay habitats in 2023 did not differ significantly from the previous year.

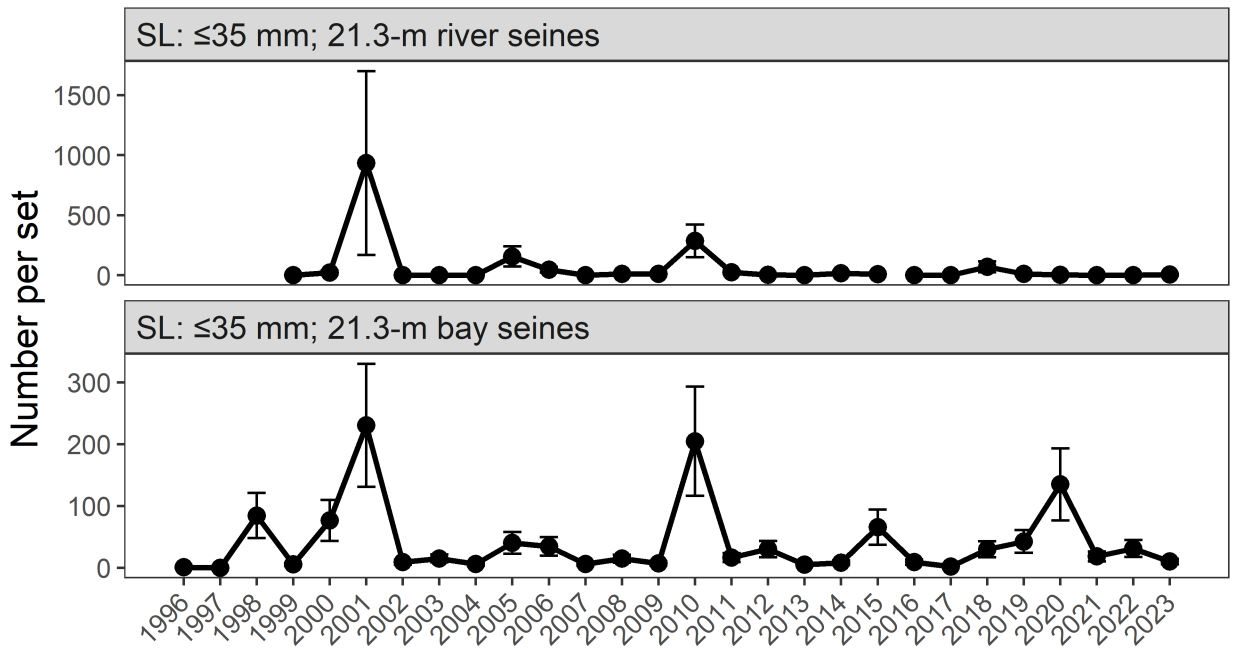

Figure 5.49: Relative abundance of young-of-the-year Striped Mullet collected between 1996 and 2023 during stratified-random sampling of the northern portion of the Indian River Lagoon. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Southern Indian River Lagoon

Annual IOAs of YOY Striped Mullet in river and tidal creek habitats of the Southern Indian River Lagoon did not show a significant trend since 2016 (Figure 5.50). Relative abundance of YOY Striped Mullet in river and tidal creek habitats in 2023 did not differ significantly from the previous year.

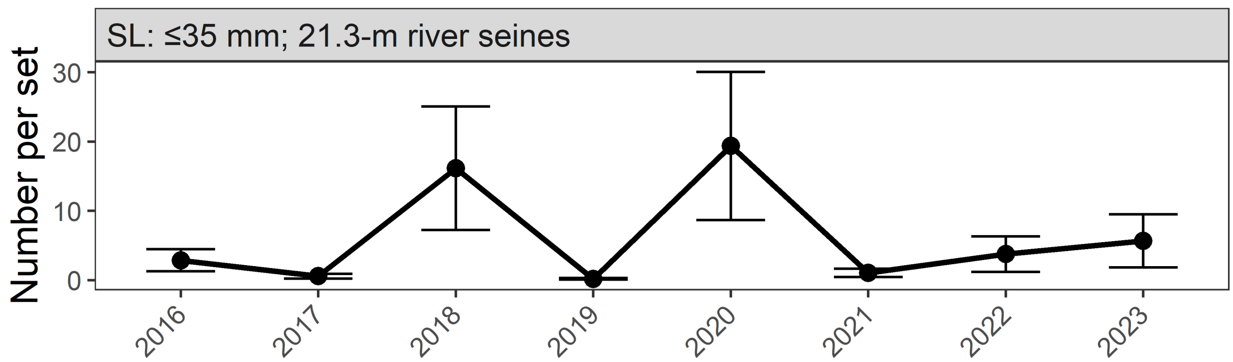

Figure 5.50: Relative abundance of young-of-the-year Striped Mullet collected between 2016 and 2023 during stratified-random sampling of the southern portion of the Indian River Lagoon. Note that river sampling began in 2016 to include previously underrepresented habitats (i.e., tidal creeks and tributaries).

5.8 Blue Crab, *Callinectes sapidus*

Blue Crab, *Callinectes sapidus*, support valuable commercial and recreational fisheries along the Gulf of Mexico (Gulf) and Atlantic coasts of Florida. From 1996 to 2022, commercial landings on Florida's Gulf and Atlantic coasts averaged 6.2 and 3.1 million pounds per year and were worth an estimated 7.0 and 4.1 million dollars, respectively (Florida Fish and Wildlife Conservation Commission 2022). Following the implementation of the Florida net limitation referendum (July 1, 1995), which eliminated the use of entangling nets within three miles of the Atlantic coast and nine miles of the Gulf coast, concerns were raised that Blue Crab populations might experience increased fishing pressure from former net fishers. Even though annual commercial landings in the Gulf peaked in 1998 at almost 13 million pounds, catch-per-unit effort was already beginning to decline (Steele and Bert 1998). Landings have decreased over the years, with the lowest commercial landings of Blue Crab occurring in 2008 for the Gulf coast and 2009 for the Atlantic coast (Florida Fish and Wildlife Conservation Commission 2022; Addis et al. 2023). Commercial fishing effort for Blue Crab has been limited in recent years by restricted species permits although there are no quotas for Blue Crab landings. The annual recreational harvest of Blue Crab is not currently known or surveyed, so the total catch may be much higher than the recorded commercial landings. The two most recent Blue Crab stock assessments for Florida indicate that Blue Crabs are highly resilient to fishing pressure and despite a generally decreasing trend in fishing mortality, abundances have remained relatively stable since the 1990's (Murphy et al. 2007; Cooper et al. 2013).

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

To monitor year-class strength and improve the ability to predict future adult Blue Crab abundances, indices of relative abundance (IOAs) were developed for YOY Blue Crab in selected Florida estuaries. Abundance data for YOY Blue Crab (≤80 mm carapace width [CW], Archambault et al. 1990; Steele and Bert 1994) collected in stratified-random 21.3-m seine samples were examined to assess recruitment into seven Florida estuaries: Apalachicola Bay, Cedar Key, Tampa Bay, Charlotte Harbor, Northeast Florida, northern Indian River Lagoon (IRL), and southern IRL. Young-of-the-year Blue Crabs were collected with 21.3-m seines during all months, but length-frequency histograms indicate they were primarily collected from August through March. These months were therefore used to define the recruitment seasons for each estuary in subsequent analyses. Data collected from August through December of each year were combined with data from January through March of the following year to create a biological year of data. The IOA for 2023 therefore only included data from August through December 2023. Separate analyses for river and bay sets were conducted when possible to examine differences in recruitment between the two habitats. Although sampling with 21.3-m seines began earlier in northern IRL, YOY Blue Crab IOAs were only calculated for data after 1997 for bay seines and 2000 for river seines, following the addition of spatial zones that yielded adequate numbers of YOY Blue Crab for analyses. Indices were not calculated for estuaries where 21.3-m seines were not deployed or where limited time series data were available.

The FIM program also monitored the abundance of adult Blue Crab (>80 mm CW) within these same Florida estuaries (including southern IRL) using stratified-random 183-m haul seines. Note, however, that some individuals classified as adults (>80 mm CW) may still have been reproductively immature as a result of individual variation in growth rates and timing of maturity (Archambault et al. 1990; Steele and Bert 1994). Due to historical changes in sampling design and available habitat, only consistently sampled zones and habitats (bay or river) in each estuary were included to generate annual IOAs.

Indices of Abundance

The following figures show relative abundance of young-of-the-year Blue Crab (≤80 mm CW) collected in 21.3-m seines and of adult Blue Crab (>80 mm CW) collected in 183-m haul seines during stratified-random sampling across all estuaries. Points represent an unbiased estimate of the mean abundance (calculated as the median value of the distribution of model estimates), while the vertical bars represent the standard error of the estimate (calculated as the 25th-75th percentiles of model estimates). Note different scales for estimates from 21.3-m and 183-m seines.

Apalachicola Bay

Annual IOAs of YOY Blue Crab in bay habitats of Apalachicola Bay have generally increased since 1997 (Figure 5.51). Relative abundance of YOY Blue Crab in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Blue Crab in Apalachicola Bay did not show a significant trend since 1998 (Figure 5.51). Relative abundance of adult Blue Crab in 2023 did not differ significantly from the previous year.

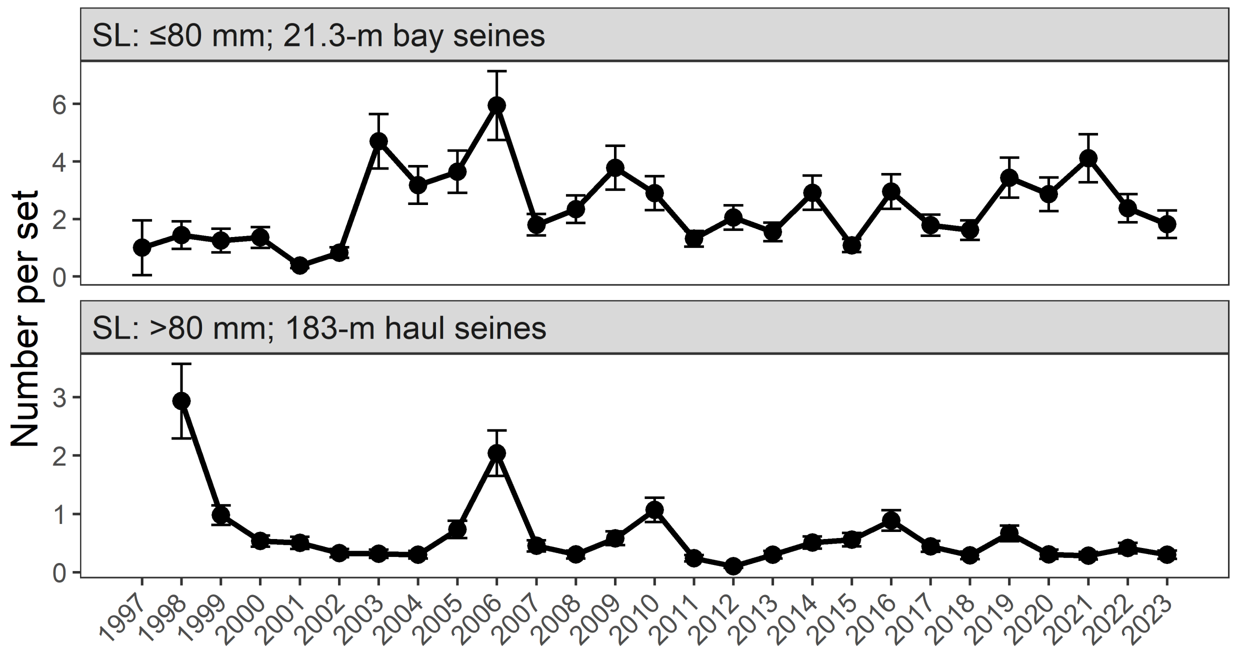

Figure 5.51: Relative abundance of young-of-the-year and adult Blue Crab collected between 1997 and 2023 during stratified-random sampling of Apalachicola Bay.

Cedar Key

Annual IOAs of YOY Blue Crab in river habitats of Cedar Key did not show a significant trend since 1996 (Figure 5.52). Relative abundance of YOY Blue Crab in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Blue Crab in bay habitats of Cedar Key did not show a significant trend since 1996 (Figure 5.52). Relative abundance of YOY Blue Crab in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Blue Crab in Cedar Key did not show a significant trend since 1997 (Figure 5.52). Relative abundance of adult Blue Crab in 2023 did not differ significantly from the previous year.

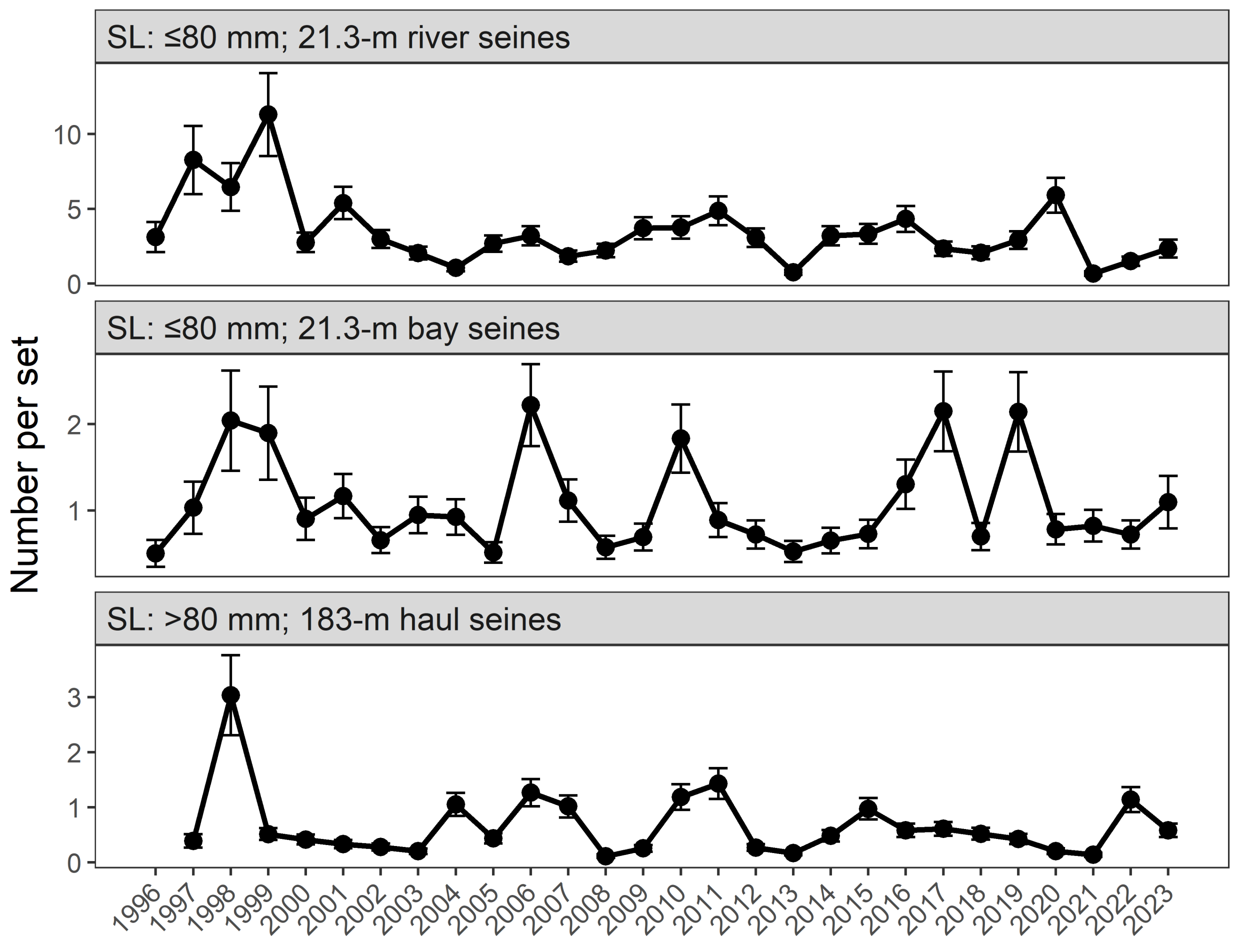

Figure 5.52: Relative abundance of young-of-the-year and adult Blue Crab collected between 1996 and 2023 during stratified-random sampling of Cedar Key.

Tampa Bay

Annual IOAs of YOY Blue Crab in river habitats of Tampa Bay have generally decreased since 1996 (Figure 5.53). Relative abundance of YOY Blue Crab in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Blue Crab in bay habitats of Tampa Bay did not show a significant trend since 1996 (Figure 5.53). Relativea abundance of YOY Blue Crab in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Blue Crab in Tampa Bay have generally decreased since 1996 (Figure 5.53). Relative abundance of adult Blue Crab in 2023 did not differ significantly from the previous year.

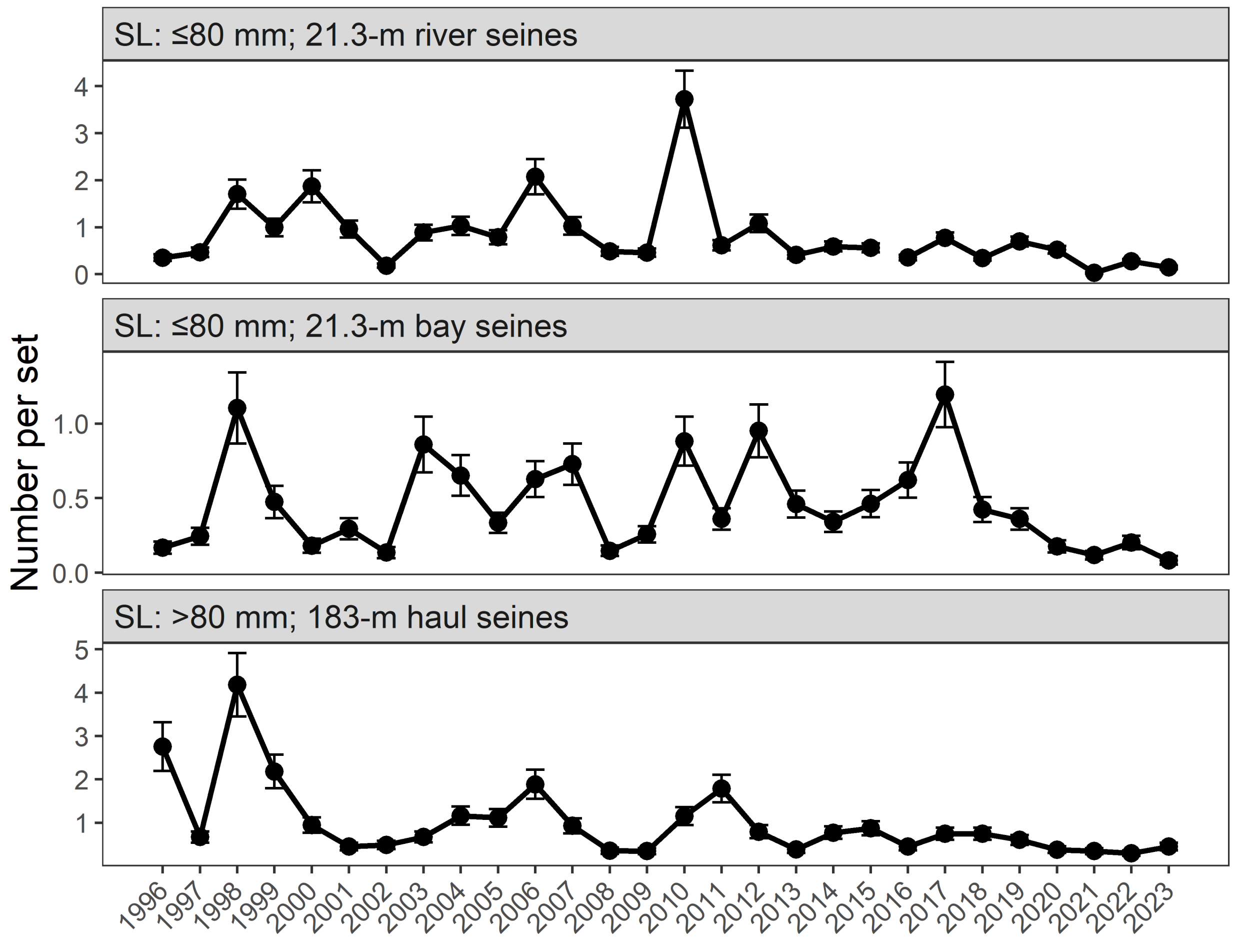

Figure 5.53: Relative abundance of young-of-the-year and adult Blue Crab collected between 1996 and 2023 during stratified-random sampling of Tampa Bay. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Charlotte Harbor

Annual IOAs of YOY Blue Crab in river habitats of Charlotte Harbor did not show a significant trend since 1996 (Figure 5.54). Relative abundance of YOY Blue Crab in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Blue Crab in bay habitats of Charlotte Harbor did not show a significant trend since 1996 (Figure 5.54). Relative abundance of YOY Blue Crab in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Blue Crab in Charlotte Harbor did not show a significant trend since 1996 (Figure 5.54). Relative abundance of adult Blue Crab in 2023 increased from the previous year.

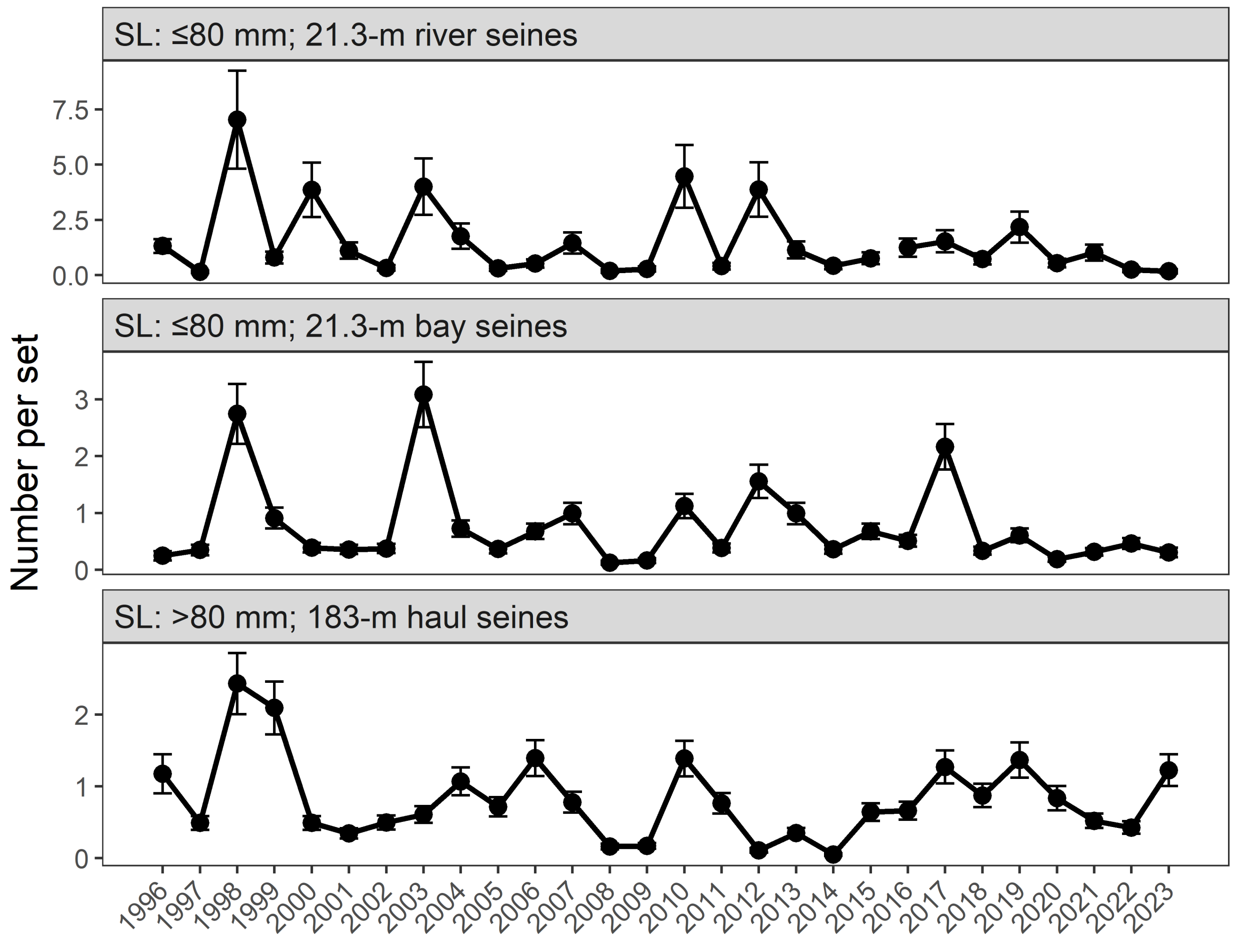

Figure 5.54: Relative abundance of young-of-the-year and adult Blue Crab collected between 1996 and 2023 during stratified-random sampling of Charlotte Harbor. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA timeseries between 2015 and 2016.

Northeast Florida

Annual IOAs of YOY Blue Crab in river habitats of northeast Florida have generally decreased since 2001 (Figure 5.56). Relative abundance of YOY Blue Crab in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Blue Crab in northeast Florida have generally decreased since 2001 (Figure 5.56). Relative abundance of adult Blue Crab in 2023 did not differ significantly from the previous year.

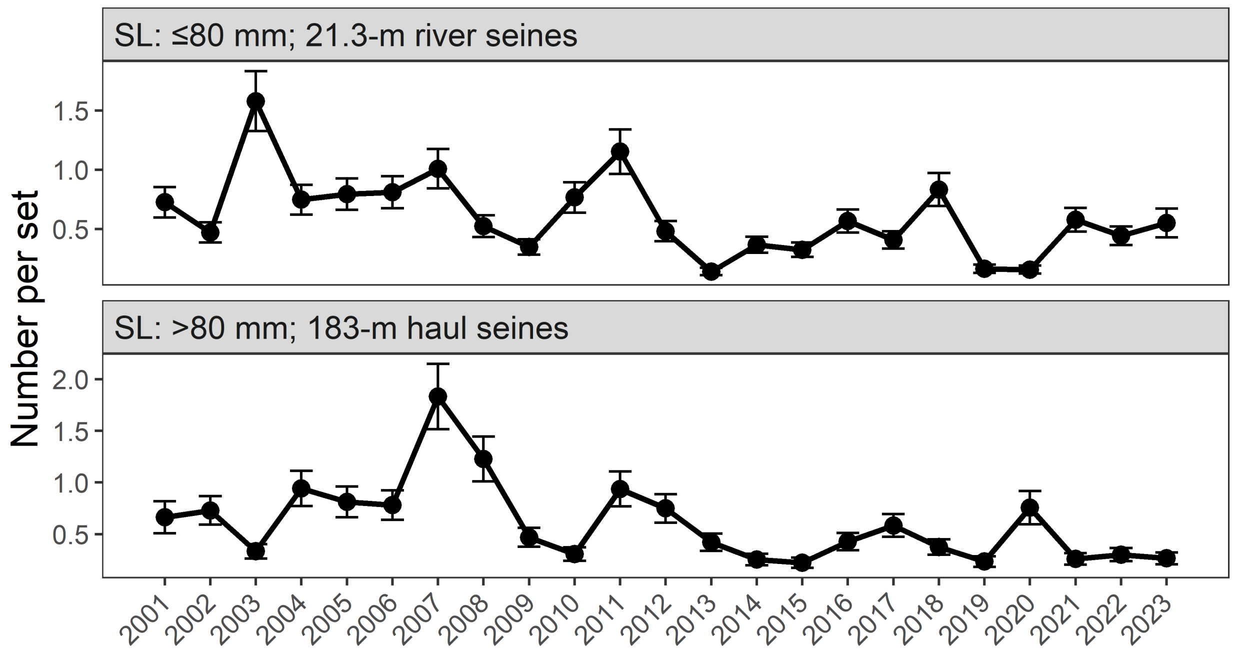

Figure 5.55: Relative abundance of young-of-the-year and adult Blue Crab collected between 2001 and 2023 during stratified-random sampling of northeast Florida.

Northern Indian River Lagoon

Annual IOAs of YOY Blue Crab in river habitats of the northern Indian River Lagoon have generally increased since 1998 (Figure 5.56). Relative abundance of YOY Blue Crab in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of YOY Blue Crab in bay habitats of the northern Indian River Lagoon did not show a significant trend since 1996 (Figure 5.56). Relative abundance of YOY Blue Crab in bay habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Blue Crab in the northern Indian River Lagoon have generally decreased since 1997 (Figure 5.56). Relative abundance of adult Blue Crab abundance in 2023 increased from the previous year.

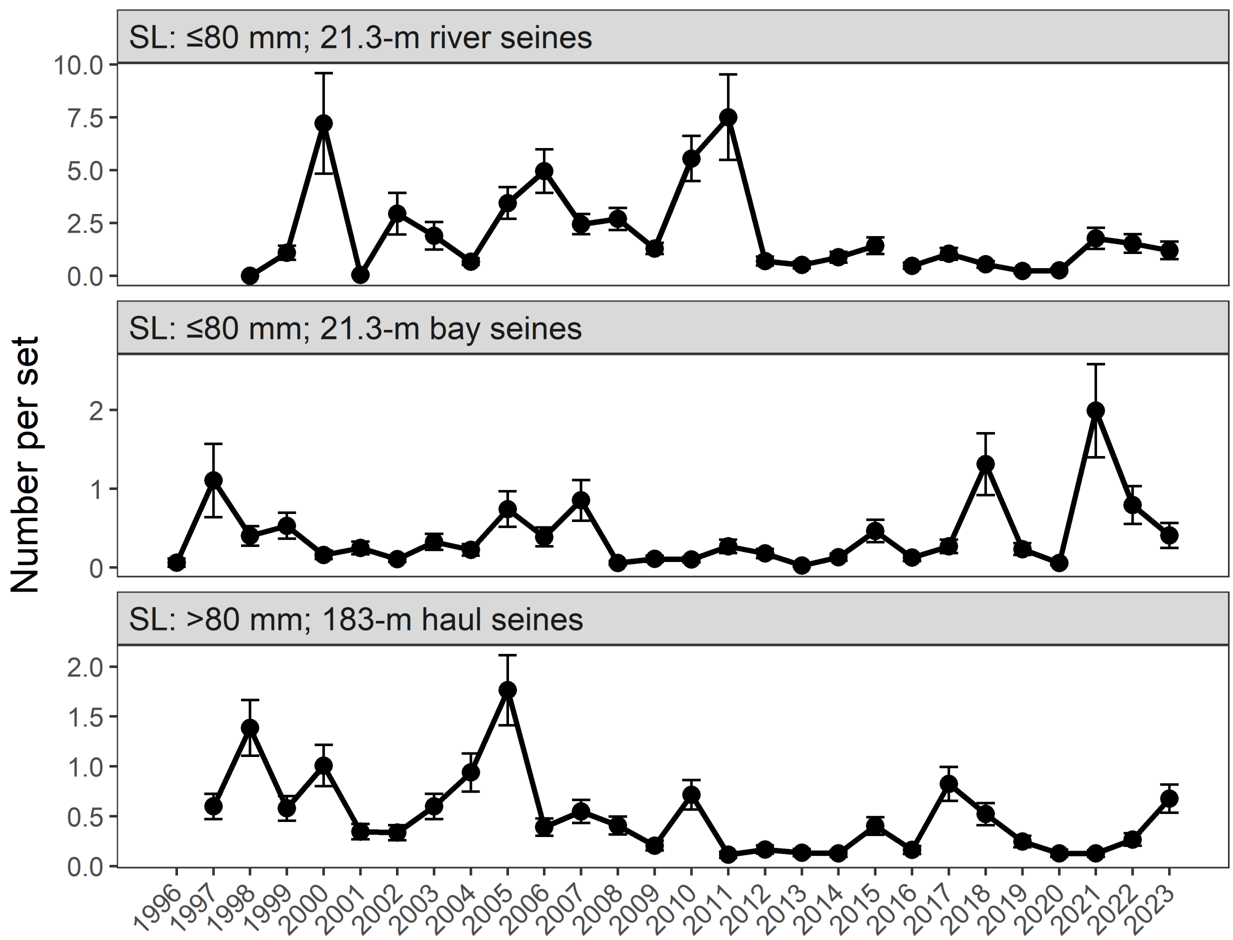

Figure 5.56: Relative abundance of young-of-the-year and adult Blue Crab collected between 1996 and 2023 during stratified-random sampling of the northern Indian River Lagoon. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries. These changes are reflected in the break in the IOA time-series between 2015 and 2016.

Southern Indian River Lagoon

Annual IOAs of YOY Blue Crab in river habitats of the southern Indian River Lagoon did not show a significant trend since 2016 (Figure 5.57). Relative abundance of YOY Blue Crab in river habitats in 2023 did not differ significantly from the previous year.

Annual IOAs of adult Blue Crab in the southern Indian River Lagoon have generally decreased since 1997 (Figure 5.57). Relative abundance of adult Blue Crab in 2023 did not differ significantly from the previous year.

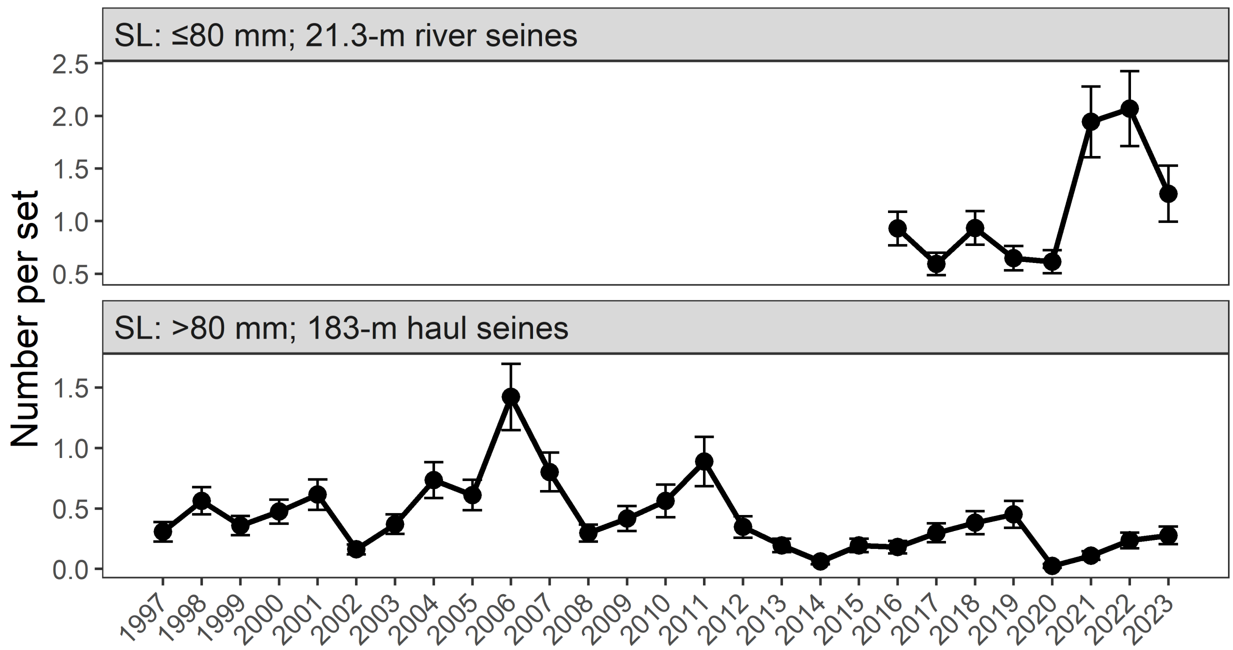

Figure 5.57: Relative abundance of young-of-the-year and adult Blue Crab collected between 1997 and 2023 during stratified-random sampling of the southern Indian River Lagoon. Note that survey design changes were implemented in 2016 to include sampling of tidal creeks and tributaries.

Length-Frequency Diagrams

The following figure shows length frequency diagrams of Blue Crab collected in 183-m haul seines. All lengths are carapace width (CW). Note different scales and years of collection for each estuary. Length-frequency data collected with 183-m haul seines indicate that this gear provides valuable information on adult Blue Crab in Florida estuaries (Figure 5.58).

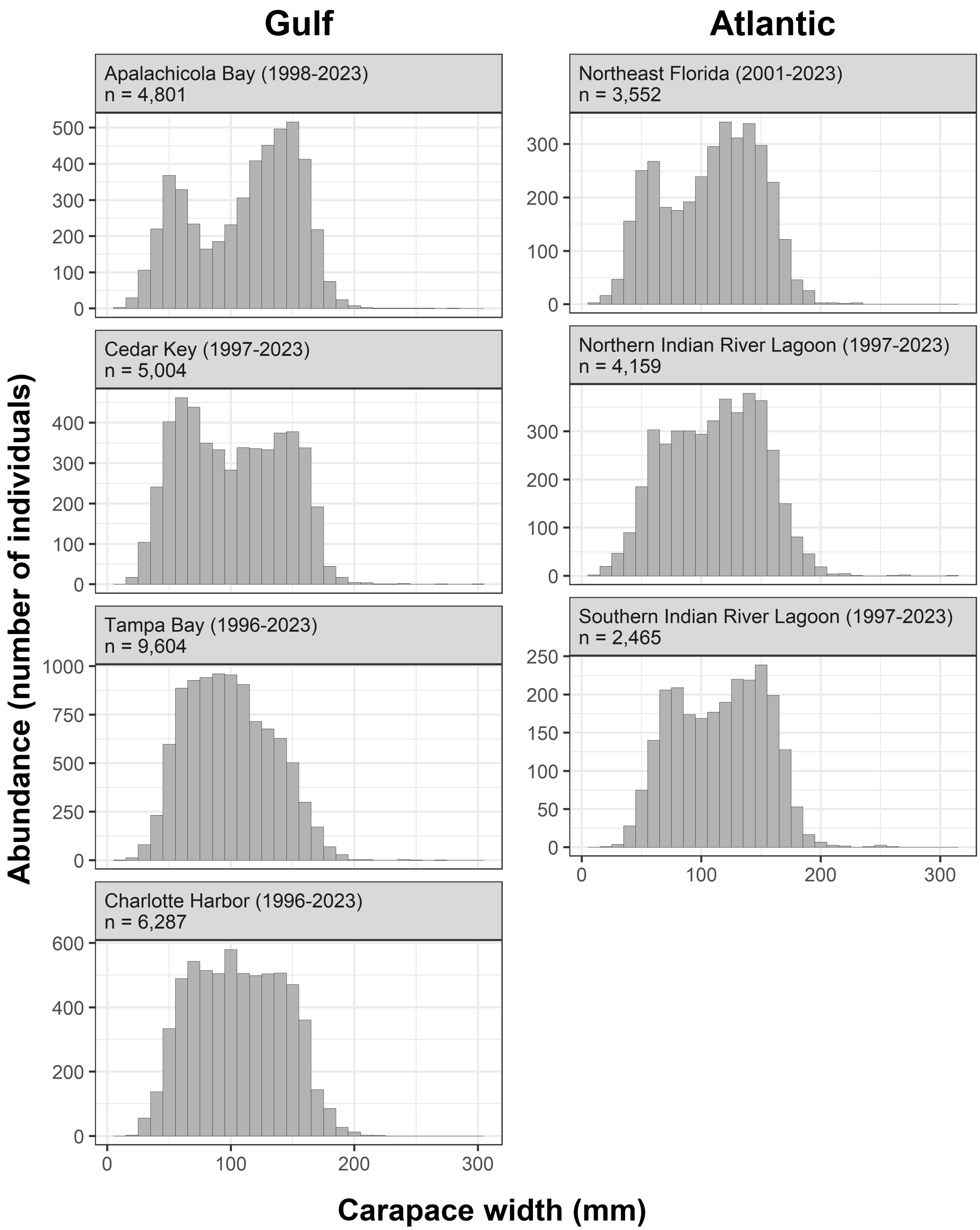

Figure 5.58: Length frequency diagrams of Blue Crab collected in 183-m haul seines.

6 Fish Health Monitoring

6.1 Introduction

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

The Fish and Wildlife Research Institute's (FWRI) FIM program began to document visually observed GEAs (including parasites) on fish and selected invertebrates in Florida's estuaries in April 1998. The main objectives of the fish health monitoring component of the FIM program are to categorize prominent types of GEAs observed, identify which species are most susceptible, and document normal background levels of fish health problems[1]. This report summarizes the occurrence of GEAs observed on fish ≥75 mm standard length (SL) and selected invertebrates collected during routine stratified-random sampling (SRS) in select Florida estuaries in 2023 (Figure 1.1).

6.2 Methods

Fish health monitoring was conducted in all Florida estuarine areas sampled by the FIM program. All fish (≥75 mm SL) and selected invertebrates were visually examined for GEAs. Abnormalities that were opportunistically observed on specimens <75 mm SL were also recorded; however, they are not presented in this report. Specimens with gross external abnormalities were assigned a Gross External Abnormality (GEA) code in the field by FIM staff, packed on ice, and returned to the lab. These specimens were sent to the FWRI's Fish and Wildlife Health (FWH) group in St. Petersburg, Florida, for detailed diagnosis. Specimens collected from estuaries outside the Tampa Bay region were either fixed in 10% formalin or shipped on ice to the FWH group. After

[1] Prior to 2022, FIM's Annual Report incorrectly documented the total number of individuals collected for each species (Table 6.3), resulting in overestimates of the proportion of unhealthy specimens in any given year. This has been rectified in current and future Annual Reports.

evaluating each specimen, the FWH group assigned a GEA code to each specimen. Gross external abnormality codes assigned by fish pathologists in the FWH group took priority over those assigned in the field. Specimens that were assigned a GEA code and released in the field (i.e., fish with scoliosis or gill isopods) retained their original GEA code assigned in the field by FIM program staff. Nine GEA codes were used:

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

6.3 Results and Discussion

Of the 224,772 fish (≥75 mm SL) and selected invertebrates that were collected statewide during FIM SRS in 2023, 612 (36 taxa, 0.3%) were observed to have a GEA (Table 6.2). The northern Indian River Lagoon had the highest incidence of specimens with GEAs (1.8%). The southern Indian River Lagoon (0%) had the lowest incidence of specimens with observed GEAs. Statewide, 9 categories of GEAs were observed in 2023. The most often identified GEA was parasitic infection (P; n=452; Table 6.3) accounting for 73.9% of all GEAs observed from all estuaries. The next most common GEA observed was red or bloody areas (B; n=50). Of the top 10 taxa observed to have a GEA, 6 were of recreational or commercial importance (i.e., Selected Taxa). *Ariopsis felis* (n=437) had the highest incidence of GEAs. The majority of the GEAs for that species were parasitic infection (P; n=386). *Ariopsis felis* (4.5%) had the highest prevalence of GEAs. The majority of the GEAs for that species were parasitic infection (P; n=386).

Table 6.2: Incidence of external abnormalities in fish and selected invertebrates collected during stratified-random sampling in each estuary during 2023.

Estuary	**Number Collected**	**Number Affected**	**Percent Affected**
Santa Rosa Sound	5,391	4	<0.1
Choctawhatchee Bay	8,257	1	<0.1
Apalachicola Bay	27,140	30	0.1
Cedar Key	16,631	11	<0.1
Tampa Bay	48,476	19	<0.1
Sarasota Bay	8,052	11	0.1
Charlotte Harbor	48,073	21	<0.1
Northeast Florda	13,352	13	<0.1
Northern Indian River Lagoon	27,346	502	1.8
Southern Indian River Lagoon	22,054	0	0
Totals	**224,772**	**612**	**0.3**

Data are based only on fish ≥75 mm SL and include total number collected, number affected by gross external abnormalities, and percentage affected by gross external abnormalities.

Table 6.3: Top 10 taxa having gross external abnormalities, sorted by descending Percent Affected, collected from all estuaries sampled by the Fisheries-Independent Monitoring program during stratified-random sampling, 2023.

Taxa	Number Collected (≥75 mm SL)	Number Affected (≥75 mm SL)	Gross External Abnormality (GEA) code[1]									Percent Affected
			P	B	F	U	E	S	T	O	D	
Ariopsis felis	9,738	437	386	46	.	1	.	1	.	3	.	4.5
Callinectes sapidus	**2,026**	**23**	**21**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**1**	**1.1**
Hypanus say	1,004	6	5	.	.	.	.	1	.	.	.	0.6
Pogonias cromis	**1,305**	**7**	**.**	**.**	**.**	**6**	**.**	**1**	**.**	**.**	**.**	**0.5**
Mugil curema	**8,269**	**31**	**18**	**.**	**10**	**2**	**.**	**1**	**.**	**.**	**.**	**0.4**
Hypanus sabinus	5,422	14	10	.	.	.	.	3	.	.	1	0.3
Leiostomus xanthurus	**5,574**	**12**	**.**	**.**	**3**	**6**	**.**	**1**	**.**	**2**	**.**	**0.2**
Centropomus undecimalis	**3,496**	**6**	**3**	**.**	**.**	**1**	**.**	**.**	**.**	**2**	**.**	**0.2**
Mugil cephalus	**8,144**	**10**	**.**	**1**	**3**	**5**	**.**	**.**	**.**	**1**	**.**	**0.1**
Lagodon rhomboides	81,771	10	1	.	3	.	1	3	.	2	.	<0.1
Subtotals (top 10 taxa with GEAs)	**126,749**	**556**	**444**	**47**	**19**	**22**	**1**	**11**	**.**	**10**	**2**	**0.4**
Totals (all taxa)	**224,772**	**611**	**452**	**50**	**28**	**36**	**1**	**17**	**5**	**18**	**4**	**0.3**

[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/cysts; O = other; D = dead.

Number collected = total number of each species collected (≥75 mm SL). Number affected = total number of individuals (≥75 mm SL) observed with abnormalities. The number of fish affected is further broken down by specific GEA Code. Percent affected = (number affected / number collected) * 100. Taxa in bold font are categorized as Selected Taxa by the FIM program.

6.4 Incidence by Bay

For each bay, specimens examined refers to the total number of each species collected (≥75 mm SL). Number affected refers to the total number of individuals (≥75 mm SL) observed with abnormalities. The number of fish affected is further broken down by specific GEA Code. Percent affected is calculated as (Number affected / Number collected) * 100. Taxa in bold font are categorized as Selected Taxa by the FIM program.

Santa Rosa Sound: Apalachicola Bay staff examined 5,391 specimens for GEAs. There were 4 individuals (<0.1%) from 3 taxa, 2 of which were selected taxa, that had a GEA (Table 6.4). Fin rot (F; n=2) was the most common GEA observed and accounted for 50% of the affected specimens within Santa Rosa Sound.

Choctawhatchee Bay: Apalachicola Bay staff examined 8,257 specimens for GEAs. There was 1 individual (<0.1%) from 1 selected taxon that had a GEA (Table 6.5). Fin rot (F) was the only GEA observed.

Apalachicola Bay: Apalachicola Bay staff examined 27,140 specimens for GEAs. There were 30 individuals (0.1%) from 13 taxa, 7 of which were selected taxa, that had a GEA (Table 6.6). Ulcer or lesion (U; n=15) was the most common GEA observed and accounted for 50% of the affected specimens within Apalachicola Bay.

Cedar Key: Cedar Key staff examined 16,631 specimens for GEAs. There were 11 individuals (<0.1%) from 6 taxa, 2 of which were selected taxa, that had a GEA (Table 6.7). Ulcer or lesion (U; n=4) was the most common GEA observed and accounted for 36.4% of the affected specimens within Cedar Key.

Tampa Bay: Tampa Bay staff examined 48,476 specimens for GEAs. There were 19 individuals (<0.1%) from 12 taxa, 6 of which were selected taxa, that had a GEA (Table 6.8). Other abnormality (O; n=5) was the most common GEA observed and accounted for 26.3% of the affected specimens within Tampa Bay.

Sarasota Bay: Tampa Bay staff examined 8,052 specimens for GEAs. There were 11 individuals (0.1%) from 4 taxa, 4 of which were selected taxa, that had a GEA (Table 6.9). Parasitic infection (P; n=8) was the most common GEA observed and accounted for 72.7% of the affected specimens within Sarasota Bay.

Charlotte Harbor: Charlotte Harbor staff examined 48,073 specimens for GEAs. There were 21 individuals (<0.1%) from 6 taxa, 3 of which were selected taxa, that had a GEA (Table 6.10). Parasitic infection (P; n=14) was the most common GEA observed and accounted for 70% of the affected specimens within Charlotte Harbor.

Northeast Florida: Northeast Florida staff examined 13,352 specimens for GEAs. There were 13 individuals (<0.1%) from 9 taxa, 6 of which were selected taxa, that had a GEA (Table 6.11). Ulcer or lesion (U; n=12) was the most common GEA observed and accounted for 92.3% of the affected specimens within Northeast Florida.

Northern Indian River Lagoon: Northern Indian River Lagoon staff examined 27,346 specimens for GEAs. There were 502 individuals (1.8%) from 18 taxa, 7 of which were selected taxa, that had a GEA (Table 6.12). Parasitic infection (P; n=424) was the most common GEA observed and accounted for 84.5% of the affected specimens within the northern Indian River Lagoon.

Southern Indian River Lagoon: Southern Indian River Lagoon staff examined 22,054 specimens for GEAs. No GEAs were reported in this estuary.

Table 6.4: List of taxa, sorted by Percent Affected in descending order, having gross external abnormalities collected in Santa Rosa Sound during stratified-random sampling, 2023.

Scientific Name	Number Collected (≥75 mm SL)	Number Affected (≥75 mm SL)	Gross External Abnormality (GEA) code[1]									Percent Affected
			P	B	F	U	E	S	T	O	D	
Micropogonias undulatus	**69**	**1**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**1.4**
Leiostomus xanthurus	**509**	**2**	**.**	**.**	**1**	**.**	**.**	**1**	**.**	**.**	**.**	**0.4**
Orthopristis chrysoptera	346	1	.	.	.	.	.	1	.	.	.	0.3
Totals (all taxa)	**5,391**	**4**	**.**	**.**	**2**	**.**	**.**	**2**	**.**	**.**	**.**	**<0.1**

[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/cysts; O = other; D = dead.

Table 6.5: List of taxa, sorted by Percent Affected in descending order, having gross external abnormalities collected in Choctawhatchee Bay during stratified-random sampling, 2023.

Scientific Name	Number Collected (≥75 mm SL)	Number Affected (≥75 mm SL)	Gross External Abnormality (GEA) code[1]									Percent Affected
			P	B	F	U	E	S	T	O	D	
Elops saurus	5	1	.	.	1	.	.	.	.	.	.	20
Totals (all taxa)	8,257	1	.	.	1	.	.	.	.	.	.	<0.1

[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/cysts; O = other; D = dead.

Table 6.6: List of taxa, sorted by Percent Affected in descending order, having gross external abnormalities collected in Apalachicola Bay during stratified-random sampling, 2023.

Scientific Name	Number Collected (≥75 mm SL)	Number Affected (≥75 mm SL)	Gross External Abnormality (GEA) code[1]									Percent Affected
			P	B	F	U	E	S	T	O	D	
Sphyrna tiburo	6	1	.	.	.	.	.	.	.	.	1	16.7
Strongylura marina	35	1	.	.	.	.	.	.	1	.	.	2.9
Paralichthys lethostigma	**51**	**1**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**2**
Pogonias cromis	**440**	**6**	**.**	**.**	**.**	**6**	**.**	**.**	**.**	**.**	**.**	**1.4**
Archosargus probatocephalus	**100**	**1**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Leiostomus xanthurus	**2,042**	**9**	**.**	**.**	**2**	**5**	**.**	**.**	**.**	**2**	**.**	**0.4**
Sciaenops ocellatus	**706**	**3**	**.**	**.**	**.**	**1**	**.**	**1**	**.**	**1**	**.**	**0.4**
Orthopristis chrysoptera	823	1	1	.	.	.	.	.	.	.	.	0.1
Bairdiella chrysoura	1,679	2	.	.	1	.	.	.	.	1	.	0.1
Micropogonias undulatus	**1,603**	**1**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**<0.1**
Hypanus sabinus	1,760	1	.	.	.	.	.	1	.	.	.	<0.1
Mugil cephalus	**2,012**	**1**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**<0.1**
Lagodon rhomboides	9,500	2	1	.	.	.	.	1	.	.	.	<0.1
Totals (all taxa)	**27,140**	**30**	**2**	**.**	**3**	**15**	**.**	**4**	**1**	**4**	**1**	**0.1**

[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/cysts; O = other; D = dead.

Table 6.7: List of taxa, sorted by Percent Affected in descending order, having gross external abnormalities collected in Cedar Key during stratified-random sampling, 2023.

Scientific Name	Number Collected (≥75 mm SL)	Number Affected (≥75 mm SL)	Gross External Abnormality (GEA) code[1]									Percent Affected
			P	B	F	U	E	S	T	O	D	
Chaetodipterus faber	77	2	.	.	1	1	.	.	.	.	.	2.6
Centropomus undecimalis	**270**	**3**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**2**	**.**	**1.1**
Brevoortia spp.	115	1	1	.	.	.	.	.	.	.	.	0.9
Orthopristis chrysoptera	715	2	.	2	.	.	.	.	.	.	.	0.3
Ariopsis felis	1,331	2	.	.	.	1	.	1	.	.	.	0.2
Mugil cephalus	**1,932**	**1**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**<0.1**
Totals (all taxa)	**16,631**	**11**	**1**	**2**	**1**	**4**	**.**	**1**	**.**	**2**	**.**	**<0.1**

[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/cysts; O = other; D = dead.

Table 6.8: List of taxa, sorted by Percent Affected in descending order, having gross external abnormalities collected in Tampa Bay during stratified-random sampling, 2023.

Scientific Name	Number Collected (≥75 mm SL)	Number Affected (≥75 mm SL)	Gross External Abnormality (GEA) code[1]									Percent Affected
			P	B	F	U	E	S	T	O	D	
Lepisosteus osseus	3	1	1	.	.	.	.	.	.	.	.	33.3
Menticirrhus americanus	**50**	**1**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**2**
Brevoortia spp.	104	2	.	.	1	1	.	.	.	.	.	1.9
Sciaenops ocellatus	**157**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**0.6**
Chaetodipterus faber	218	1	.	.	.	.	.	.	.	1	.	0.5
Cynoscion nebulosus	**243**	**1**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**0.4**
Callinectes sapidus	**263**	**1**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**0.4**
Eugerres plumieri	263	1	.	.	.	.	.	.	.	1	.	0.4
Archosargus probatocephalus	**491**	**1**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**0.2**
Centropomus undecimalis	**1,084**	**1**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**<0.1**
Lagodon rhomboides	25,136	7	.	.	2	.	1	2	.	2	.	<0.1
Eucinostomus gula	6,797	1	1	.	.	.	.	.	.	.	.	<0.1
Totals (all taxa)	**48,476**	**19**	**3**	**.**	**3**	**4**	**1**	**3**	**.**	**5**	**.**	**<0.1**

[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/cysts; O = other; D = dead.

Table 6.9: List of taxa, sorted by Percent Affected in descending order, having gross external abnormalities collected in Sarasota Bay during stratified-random sampling, 2023.

Scientific Name	Number Collected (≥75 mm SL)	Number Affected (≥75 mm SL)	Gross External Abnormality (GEA) code[1]									Percent Affected
			P	B	F	U	E	S	T	O	D	
Callinectes sapidus	77	8	8	.	.	.	.	.	.	.	.	10.4
Cynoscion nebulosus	59	1	.	.	.	.	.	1	.	.	.	1.7
Archosargus probatocephalus	285	1	.	.	.	.	.	.	1	.	.	0.4
Mugil cephalus	427	1	.	.	.	1	.	.	.	.	.	0.2
Totals (all taxa)	8,052	11	8	.	.	1	.	1	1	.	.	0.1

[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/cysts; O = other; D = dead.

Table 6.10: List of taxa, sorted by Percent Affected in descending order, having gross external abnormalities collected in Charlotte Harbor during stratified-random sampling, 2023.

Scientific Name	Number Collected (≥75 mm SL)	Number Affected (≥75 mm SL)	Gross External Abnormality (GEA) code[1]									Percent Affected
			P	B	F	U	E	S	T	O	D	
Callinectes sapidus	**398**	**14**	**13**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**3.5**
Hypanus sabinus	105	1	.	.	.	.	.	.	.	.	1	1
Mugil cephalus	**141**	**1**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**0.7**
Synodus foetens	153	1	.	.	.	.	.	.	.	.	1	0.7
Bairdiella chrysoura	1,734	2	.	.	2	.	.	.	.	.	.	0.1
Centropomus undecimalis	**1,266**	**1**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**<0.1**
Totals (all taxa)	**48,073**	**20**	**14**	**1**	**2**	**.**	**.**	**.**	**.**	**.**	**3**	**<0.1**

[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/cysts; O = other; D = dead.

Table 6.11: List of taxa, sorted by Percent Affected in descending order, having gross external abnormalities collected in northeast Florida during stratified-random sampling, 2023.

Scientific Name	Number Collected (≥75 mm SL)	Number Affected (≥75 mm SL)	Gross External Abnormality (GEA) code[1]									Percent Affected
			P	B	F	U	E	S	T	O	D	
Chloroscombrus chrysurus	55	1	.	.	.	1	.	.	.	.	.	1.8
Cynoscion complex	**175**	**3**	**.**	**.**	**.**	**3**	**.**	**.**	**.**	**.**	**.**	**1.7**
Paralichthys lethostigma	**90**	**1**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1.1**
Strongylura marina	124	1	.	.	.	1	.	.	.	.	.	0.8
Sciaenops ocellatus	**129**	**1**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**0.8**
Bairdiella chrysoura	507	1	.	.	1	.	.	.	.	.	.	0.2
Mugil cephalus	**1,672**	**2**	**.**	**.**	**.**	**2**	**.**	**.**	**.**	**.**	**.**	**0.1**
Mugil curema	**1,707**	**2**	**.**	**.**	**.**	**2**	**.**	**.**	**.**	**.**	**.**	**0.1**
Leiostomus xanthurus	**952**	**1**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**0.1**
Totals (all taxa)	**13,352**	**13**	**.**	**.**	**1**	**12**	**.**	**.**	**.**	**.**	**.**	**<0.1**

[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/cysts; O = other; D = dead.

Table 6.12: List of taxa, sorted by Percent Affected in descending order, having gross external abnormalities collected in the northern Indian River Lagoon during stratified-random sampling, 2023.

Scientific Name	Number Collected (≥75 mm SL)	Number Affected (≥75 mm SL)	Gross External Abnormality (GEA) code[1]									Percent Affected
			P	B	F	U	E	S	T	O	D	
Ariopsis felis	2,071	435	386	46	.	.	.	.	.	3	.	21
Hypanus say	230	6	5	.	.	.	.	1	.	.	.	2.6
Mugil rubrioculus	**44**	**1**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**2.3**
Cynoscion nebulosus	**57**	**1**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1.8**
Hypanus sabinus	767	12	10	.	.	.	.	2	.	.	.	1.6
Sphoeroides nephelus	340	3	1	.	.	.	.	.	1	1	.	0.9
Eugerres plumieri	124	1	.	.	1	.	.	.	.	.	.	0.8
Mugil curema	**3,807**	**29**	**18**	**.**	**10**	**.**	**.**	**1**	**.**	**.**	**.**	**0.8**
Chilomycterus schoepfii	172	1	.	.	.	.	.	.	.	1	.	0.6
Sphoeroides testudineus	360	2	.	.	.	.	.	.	1	1	.	0.6
Strongylura notata	188	1	.	.	.	.	.	.	1	.	.	0.5
Archosargus probatocephalus	**260**	**1**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**0.4**
Mugil cephalus	**1,043**	**4**	**.**	**.**	**3**	**.**	**.**	**.**	**.**	**1**	**.**	**0.4**
Caranx hippos	278	1	.	1	.	.	.	.	.	.	.	0.4
Centropomus undecimalis	**350**	**1**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**0.3**
Pogonias cromis	**372**	**1**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**0.3**
Lagodon rhomboides	1,000	1	.	.	1	.	.	.	.	.	.	0.1
Brevoortia spp.	1,163	1	1	.	.	.	.	.	.	.	.	<0.1
Totals (all taxa)	**27,346**	**502**	**424**	**47**	**15**	**.**	**.**	**6**	**3**	**7**	**.**	**1.8**

Scientific Name	Number Collected (≥75 mm SL)	Number Affected (≥75 mm SL)	Gross External Abnormality (GEA) code[1]									Percent Affected
			P	B	F	U	E	S	T	O	D	

[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/cysts; O = other; D = dead.

Part II

Fisheries-Independent Monitoring: Polyhaline Seagrass Sampling

7 Introduction

The Fisheries-Independent Monitoring (FIM) program has conducted inshore (estuarine) monitoring in various eastern Gulf of Mexico estuaries as early as 1989, but habitats commonly occupied by juvenile reef fish species (i.e., seagrass beds and shoals) were underrepresented. Indeed, the FIM program captured highly variable numbers of juveniles of estuarine-dependent reef species, resulting in highly variable indices of juvenile abundance (Switzer et al. 2012, 2015; Flaherty-Walia et al. 2015). Researchers and managers recommended improving indices of juvenile abundance for reef species (Switzer et al. 2012; Flaherty-Walia et al. 2015) so in 2008, FIM initiated a complementary sampling survey to fulfill the mission of providing timely and accurate data for fishery management. Results from existing FIM data for the eastern Gulf of Mexico were used to inform the design of the complementary survey to characterize the abundance of juvenile gag, *Mycteroperca microlepis* (Casey et al. 2007; Switzer et al. 2015), and other estuarine-dependent and seagrass-associated reef fishes by targeting the preferred polyhaline (salinity>18 PSU) seagrass habitat. Work in Charlotte Harbor was instrumental in developing the survey, as Casey et al. (2007) documented that juvenile gag were collected mainly between April and December in habitats with ≥50% seagrass cover. In 2008, the FIM program initiated this complementary polyhaline seagrass survey to extend its standard, long-term monitoring survey to deep seagrass habitats found in estuaries already sampled by the FIM program and in adjacent estuaries not sampled by the FIM program. The polyhaline seagrass survey was originally conducted in St. Andrew Bay, Apalachicola Bay, three sub-areas in the Big Bend area (near St. Marks, the Econfina and Steinhatchee rivers), Tampa Bay, and Charlotte Harbor. In 2021, polyhaline seagrass survey methodology was adopted in Choctawhatchee Bay and Santa Rosa Sound near Fort Walton to help provide data for Spotted Seatrout, *Cynoscion nebulosus*, management (Figure 7.1). This survey provides necessary data for improving existing single species assessments as well as furthering the development of a multi-species, ecosystem-based approach to fisheries resource assessment on the West Florida shelf and eastern Gulf waters.

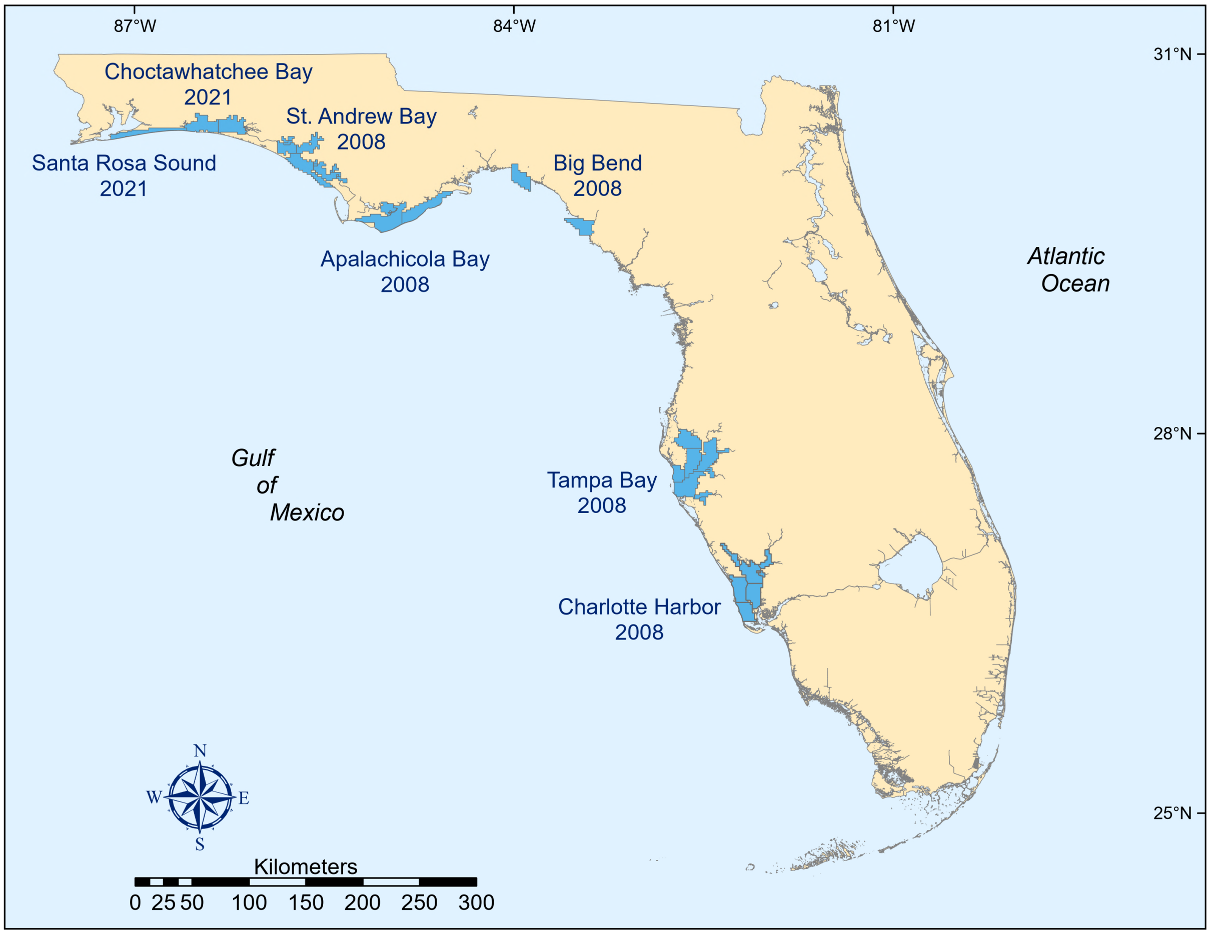

Figure 7.1: Locations of Polyhaline Seagrass Survey study areas sampled by the Fisheries-Independent Monitoring program. Years indicate initiation of sampling.

8 Methods

The polyhaline seagrass survey was conducted along the eastern Gulf of Mexico between 26° and 31° N latitude within six estuarine systems and the Big Bend area (Figure 7.1). The sampling universe for each area was created using bathymetry and seagrass coverage data from the local water management districts. To ensure sampling effort was allocated spatially within each estuarine system, spatial sampling zones were created. Sampling strata were defined based on bathymetric variability and seagrass coverage: microgrids (0.1-nm²) that were in the appropriate depth range (1.0-7.6m) for the sampling gear and contained known seagrass were included in the universe. The sampling gear was identical to that used in the standard long-term FIM stratified random sampling survey: the 6.1-m otter trawl. All sample work-up methods were the same as those described in Chapter 2.

Monthly (June–November) surveys were conducted following a stratified-random survey design where microgrids were randomly selected. Trawling was conducted over areas with >50% submerged aquatic vegetation coverage and where water depth ranged between 1.0 and 7.6 m. Additional details regarding 6.1-m otter trawl sampling in the WI survey can be found in Switzer et al. (2012), Flaherty-Walia et al. (2015), and Schrandt et al. (2018; 2021, 2023). Sampling of polyhaline seagrass areas was conducted in Santa Rosa Sound, Choctawhatchee Bay, St. Andrew Bay, Apalachicola Bay, the Big Bend region (in proximity to the Econfina and Steinhatchee rivers), Tampa Bay, and Charlotte Harbor. This section includes a description of and catch summary from each estuarine system for all taxa sampled as well as for species of interest, which include reef-associated species and managed species (Table 8.1). Several of these species are also included in the list of selected taxa that are highlighted in FIM's core sampling (Table 4). Catch summaries are combined over all zones within each estuarine system.

Table 8.1: Animals designated as species of interest by the Fisheries Independent Monitoring program because of their recreational and commercial importance or association with reef structure.

Scientific Name	Common Name
Archosargus probatocephalus	Sheepshead
Centropomus undecimalis	Common Snook
Centropristis striata	Black Sea Bass
Cynoscion nebulosus	Spotted Seatrout
Epinephelus morio	Red Grouper
Haemulon plumierii	White Grunt
Lachnolaimus maximus	Hogfish
Lutjanus griseus	Gray Snapper
Lutjanus synagris	Lane Snapper
Mycteroperca microlepis	Gag
Sciaenops ocellatus	Red Drum

Table 8.2: Summary of catch and effort data by estuary for polyhaline seagrass sampling, 2023.

Bay	Animals	Hauls
Santa Rosa Sound	28,144	48
Choctawhatchee Bay	10,587	54
St. Andrew Bay	20,963	72
Apalachicola Bay	25,587	96
Big Bend	28,096	180
Tampa Bay	42,179	144
Charlotte Harbor	31,628	120
Totals	**187,184**	**714**

9 Data Summary by Estuary

9.1 Santa Rosa Sound

Santa Rosa Sound is a 109-km^2 lagoon connecting Pensacola Bay to the west and Choctawhatchee Bay to the east (Northwest Florida Water Management District 2017a). The lagoon has no tidal tributaries for direct freshwater input but is connected to the Gulf of Mexico by a deep pass west of Santa Rosa Island (Figure 9.1). Shoreline vegetation consists primarily of the marsh grasses *Spartina alterniflora* and *Panicum hemitomon* (Miller et al. 2001). Bottom substrate is mostly sand (Miller et al. 2001) and bottom vegetation consists primarily of seagrasses such as *Halodule wrightii* and *Thalassia testudinum* (Bradley and Houser 2009). Seagrass beds covered nearly 25% of the lagoon in 1960, but by 1992 less than half remained because of wastewater discharge, dredging, and beach modifications (Handley et al. 2007). By 2010, seagrass coverage declined by an additional 5% (Yarbro and Carlson 2016).

Monthly sampling in Santa Rosa Sound was completed from June through November with a total of 28,144 individuals collected across 48 samples (Table 8.2). The most abundant taxa collected in Santa Rosa Sound polyhaline seagrass sampling were *Lagodon rhomboides* (n=20,468) and *Bairdiella chrysoura* (n=2,026), accounting for 79.9% of the trawl catch (Table 9.1). The taxa most frequently caught in Santa Rosa Sound polyhaline seagrass sampling were *Lagodon rhomboides* (97.9% occurrence) and *Orthopristis chrysoptera* (89.6% occurrence).

A total of 403 animals from 5 species of interest were collected, representing 1.4% of the entire polyhaline seagrass trawl catch (Table 9.2). *Cynoscion nebulosus* (n=385) was the most abundant species of interest, accounting for 95.5% of the species of interest collected in polyhaline seagrass trawls (Table 9.2). The species of interest most frequently caught in Santa Rosa Sound polyhaline seagrass sampling were *Cynoscion nebulosus* (75% occurrence) and *Lutjanus griseus* (10.4% occurrence).

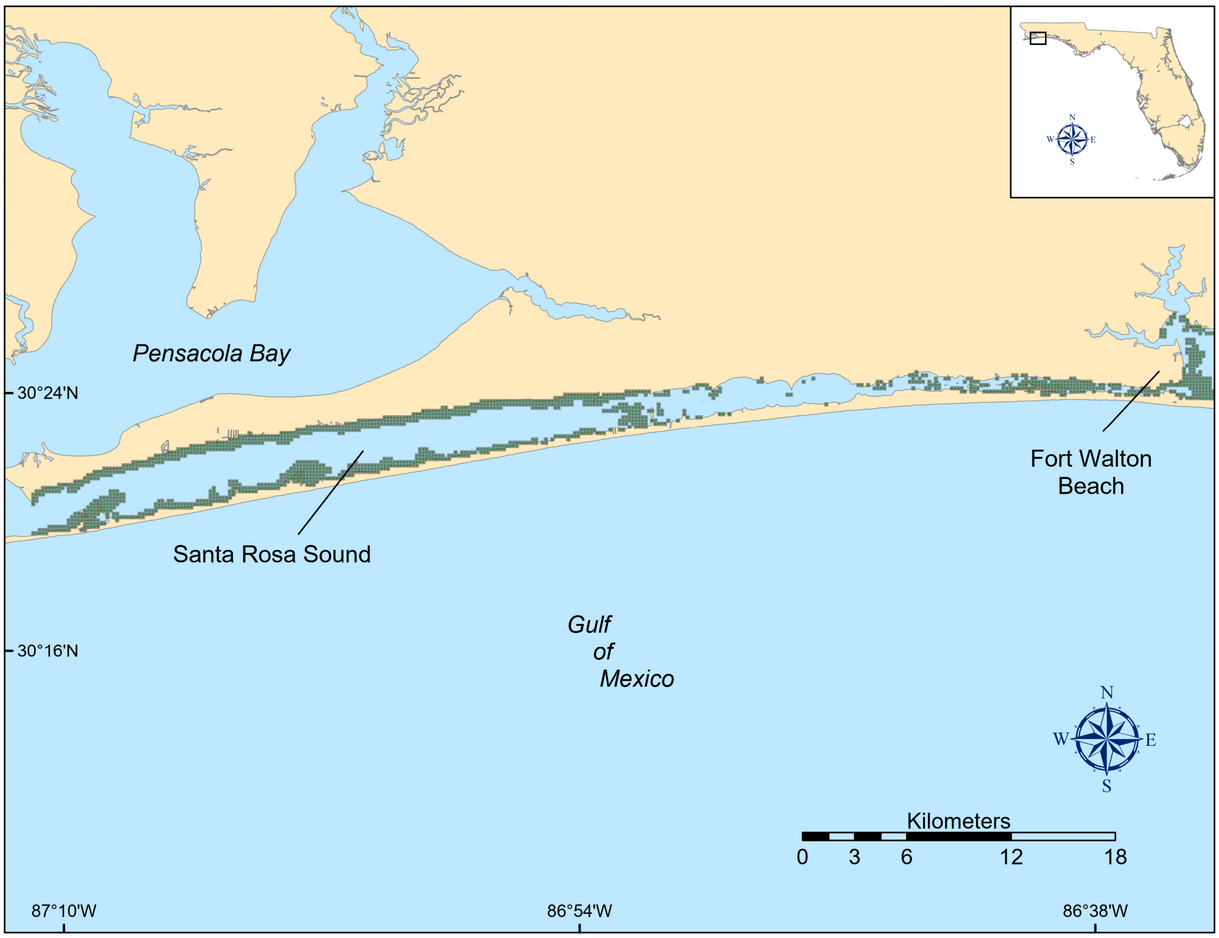

Figure 9.1: Santa Rosa Sound polyhaline seagrass habitat sampling universe. Micro-grids (0.1nm^2) eligible to be sampled are indicated in green. Adjacent areas that met the sampling requirements, but were not necessarily included in the original universe, could be sampled if necessary.

Table 9.1: Catch statistics for 10 dominant taxa collected in 48 6.1-m otter trawl samples during Santa Rosa Sound polyhaline seagrass sampling, June-November, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	20,468	72.7	97.9	39.89	6.29	131.07	185.94	58	0.22	20	162
Bairdiella chrysoura	2,026	7.2	83.3	5.53	1.04	133.44	36.29	56	0.68	10	142
Orthopristis chrysoptera	2,091	7.4	89.6	4.09	0.72	146.07	29.80	94	0.92	23	202
Farfantepenaeus spp.	624	2.2	66.7	1.82	0.52	198.92	17.39	10	0.10	4	14
Syngnathus floridae	388	1.4	83.3	1.09	0.16	102.01	4.54	147	1.74	43	210
Harengula jaguana	359	1.3	12.5	1.01	0.95	654.83	45.87	32	0.21	27	64
Callinectes sapidus	336	1.2	64.6	0.91	0.29	219.30	11.16	62	1.44	7	185
Cynoscion nebulosus	385	1.4	75.0	0.90	0.16	135.25	5.25	58	2.04	6	320
Eucinostomus spp.	281	1.0	64.6	0.83	0.32	266.01	12.14	21	0.35	12	39
Syngnathus scovelli	236	0.8	83.3	0.69	0.11	114.18	3.15	85	1.03	35	127
Subtotals	27,194	96.6	.	.	.	.	.	.	.	4	320
Totals	**28,110**	**99.9**	**.**	**79.11**	**9.48**	**83.01**	**279.28**	**.**	**.**	**3**	**350**

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.

Table 9.2: Catch statistics for species of interest collected in 48 6.1-m otter trawl samples during Santa Rosa Sound polyhaline seagrass sampling, June-November, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Cynoscion nebulosus	385	1.4	75.0	0.90	0.16	135.25	5.25	58	2.04	6	320
Lutjanus griseus	8	<0.1	10.4	0.02	0.01	387.86	0.60	93	22.06	40	211
Archosargus probatocephalus	7	<0.1	10.4	0.02	0.01	338.68	0.40	25	3.14	16	33
Sciaenops ocellatus	2	<0.1	4.2	0.01	<0.01	485.36	0.15	254	34.50	220	289
Mycteroperca microlepis	1	<0.1	2.1	<0.01	<0.01	692.82	0.12	140	.	140	140
Totals	**403**	**1.4**	**.**	**1.18**	**0.20**	**115.06**	**5.25**	**.**	**.**	**6**	**320**

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.

9.2 Choctawhatchee Bay

Choctawhatchee Bay ([Figure 9.2]) is a 334-km^2 estuary located in the central Florida Panhandle that is connected to the Gulf of Mexico by a shallow man-made channel, East Pass, near the city of Destin [Handley et al. (2007); Northwest Florida Water Management District (2017b)]. Tidal influence is minimal and tidal ranges are small, from 0.15 to 0.5 meters [Huguenard et al. (2016)]. Major habitat types in Choctawhatchee Bay include tidal marshes, seagrass beds, bayous, and oyster beds [Northwest Florida Water Management District (2017b)]. Shoreline vegetation consists mostly of the marsh grasses *Juncus roemerianus*, *Spartina alterniflora*, and *Scirpus* spp. [Northwest Florida Water Management District (2017b)]. Choctawhatchee Bay is moderately deep with depths ranging from 3 to 13 meters and bottom substrate that is mostly sand, mud, and shell [Handley et al. (2007); Northwest Florida Water Management District (2017b)]. Bottom vegetation is predominantly *Halodule wrightii* with patches of *Ruppia maritima* and *Thalassia testudinum* [Handley et al. (2007); Northwest Florida Water Management District (2017b)]. Choctawhatchee Bay seagrass beds covered 17.2 km^2 in 1992 but had declined by 55% by 2007 (Yarbro and Carlson 2016). Seagrass losses observed in Choctawhatchee Bay are a result of urbanization, especially the construction of seawalls, which reduces the size of intertidal areas and impedes seagrass growth (Handley et al. 2007).

Monthly sampling in Choctawhatchee Bay was completed from June through November with a total of 10,587 individuals collected across 54 samples (Table 8.2). The most abundant taxa collected in Choctawhatchee Bay polyhaline seagrass sampling were *Lagodon rhomboides* (n=4,175) and *Bairdiella chrysoura* (n=1,508), accounting for 53.6% of the trawl catch (Table 9.3). The taxa most frequently caught in Choctawhatchee Bay polyhaline seagrass sampling were *Lagodon rhomboides* (88.9% occurrence) and *Eucinostomus* spp. (85.2% occurrence).

A total of 565 animals from 4 species of interest were collected, representing 5.3% of the entire polyhaline seagrass trawl catch (Table 9.4). *Cynoscion nebulosus* (n=431) was the most abundant species of interest, accounting for 76.3% of the species of interest collected in polyhaline seagrass trawls (Table 9.4). The species of interest most frequently caught in Choctawhatchee Bay polyhaline seagrass sampling were *Cynoscion nebulosus* (70.4% occurrence) and *Lutjanus griseus* (35.2% occurrence).

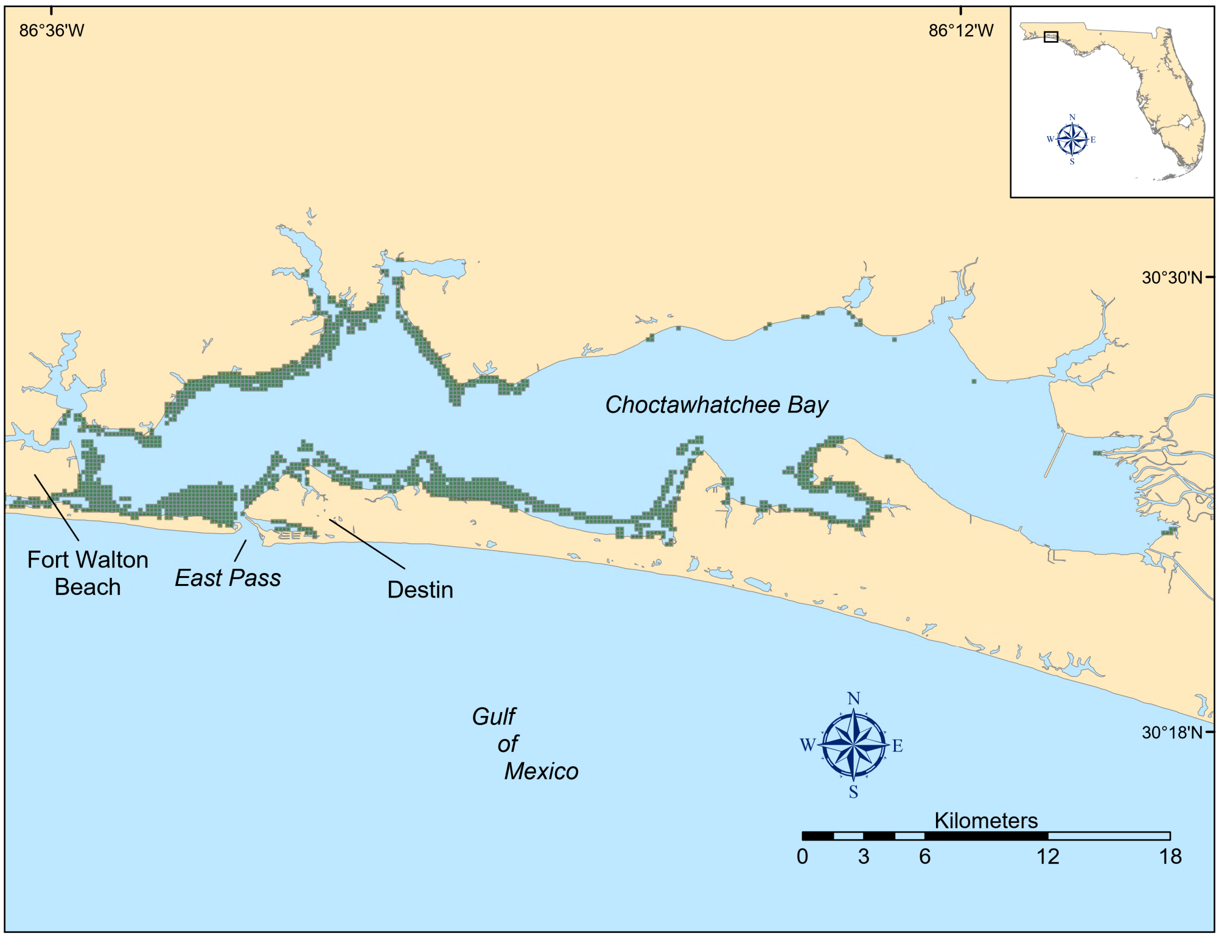

Figure 9.2: Choctawhatchee Bay polyhaline seagrass habitat sampling universe. Micro-grids ($0.1 nm^2$) eligible to be sampled are indicated in green. Adjacent areas that met the sampling requirements, but were not necessarily included in the original universe, could be sampled if necessary.

Table 9.3: Catch statistics for 10 dominant taxa collected in 54 6.1-m otter trawl samples during Choctawhatchee Bay polyhaline seagrass sampling, June-November, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	4,175	39.4	88.9	8.67	1.64	152.86	59.90	66	0.41	12	208
Bairdiella chrysoura	1,508	14.2	64.8	3.69	0.93	189.35	38.83	48	0.57	11	139
Eucinostomus spp.	1,495	14.1	85.2	3.66	1.30	260.45	60.58	21	0.19	10	39
Orthopristis chrysoptera	610	5.8	72.2	1.41	0.25	136.33	10.52	94	1.67	19	200
Farfantepenaeus spp.	401	3.8	61.1	1.01	0.29	211.13	12.95	11	0.12	4	14
Callinectes sapidus	401	3.8	66.7	1.00	0.26	188.69	9.04	55	2.01	3	181
Cynoscion nebulosus	431	4.1	70.4	0.95	0.18	151.27	6.34	47	1.37	14	241
Anchoa mitchilli	177	1.7	9.3	0.47	0.29	454.64	13.79	21	0.26	11	30
Paralichthys albigutta	186	1.8	77.8	0.46	0.08	124.06	2.58	143	3.17	58	292
Syngnathus scovelli	135	1.3	57.4	0.33	0.09	201.75	3.64	82	1.10	42	109
Subtotals	9,519	90.0	.	.	.	.	.	.	.	3	292
Totals	**10,584**	**100.0**	**.**	**26.45**	**3.14**	**87.25**	**108.47**	**.**	**.**	**3**	**320**

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.

Table 9.4: Catch statistics for species of interest collected in 54 6.1-m otter trawl samples during Choctawhatchee Bay polyhaline seagrass sampling, June-November, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Cynoscion nebulosus	431	4.1	70.4	0.95	0.18	151.27	6.34	47	1.37	14	241
Lutjanus griseus	107	1.0	35.2	0.27	0.09	256.12	4.18	45	2.03	14	192
Sciaenops ocellatus	18	0.2	9.3	0.05	0.03	435.55	1.35	58	15.60	12	201
Lutjanus synagris	9	0.1	7.4	0.02	0.01	416.61	0.54	50	5.16	17	66
Totals	**565**	**5.3**	**.**	**1.43**	**0.23**	**118.84**	**6.34**	**.**	**.**	**12**	**241**

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.

9.3 St. Andrew Bay

St. Andrew Bay (Figure 9.3) is located adjacent to Panama City, Florida and covers approximately 280 square miles (Keppner and Keppner 2001). The estuary includes several smaller bays and extends almost 50 miles along the Gulf Coast. St. Andrew Bay is unique from other estuaries in the study due to its lack of direct freshwater inflow from a major river system. However, it does receive freshwater flow from numerous creeks, bayous and wastewater treatment plants. This limited amount of freshwater maximizes the influence of Gulf of Mexico water, which is connected to the bay via West Pass. St. Andrew Bay has the largest stock of seagrass in the Florida panhandle. Tidal flats and salt marshes are also prevalent in the bay system ("GulfBase website" 2023).

Monthly sampling in St. Andrew Bay was completed from June through November with a total of 20,963 individuals collected across 72 samples (Table 8.2). The most abundant taxa collected in St. Andrew Bay polyhaline seagrass sampling were *Lagodon rhomboides* (n=13,383) and *Eucinostomus* spp. (n=2,667), accounting for 76.5% of the trawl catch (Table 9.5). The taxa most frequently caught in St. Andrew Bay polyhaline seagrass sampling were *Lagodon rhomboides* (94.4% occurrence) and *Paralichthys albigutta* (88.9% occurrence).

A total of 161 animals from 4 species of interest were collected, representing 0.8% of the entire polyhaline seagrass trawl catch (Table 9.6). *Cynoscion nebulosus* (n=98) was the most abundant species of interest, accounting for 60.9% of the species of interest collected in polyhaline seagrass trawls (Table 9.6). The species of interest most frequently caught in St. Andrew Bay polyhaline seagrass sampling were *Cynoscion nebulosus* (33.3% occurrence) and *Lutjanus griseus* (19.4% occurrence).

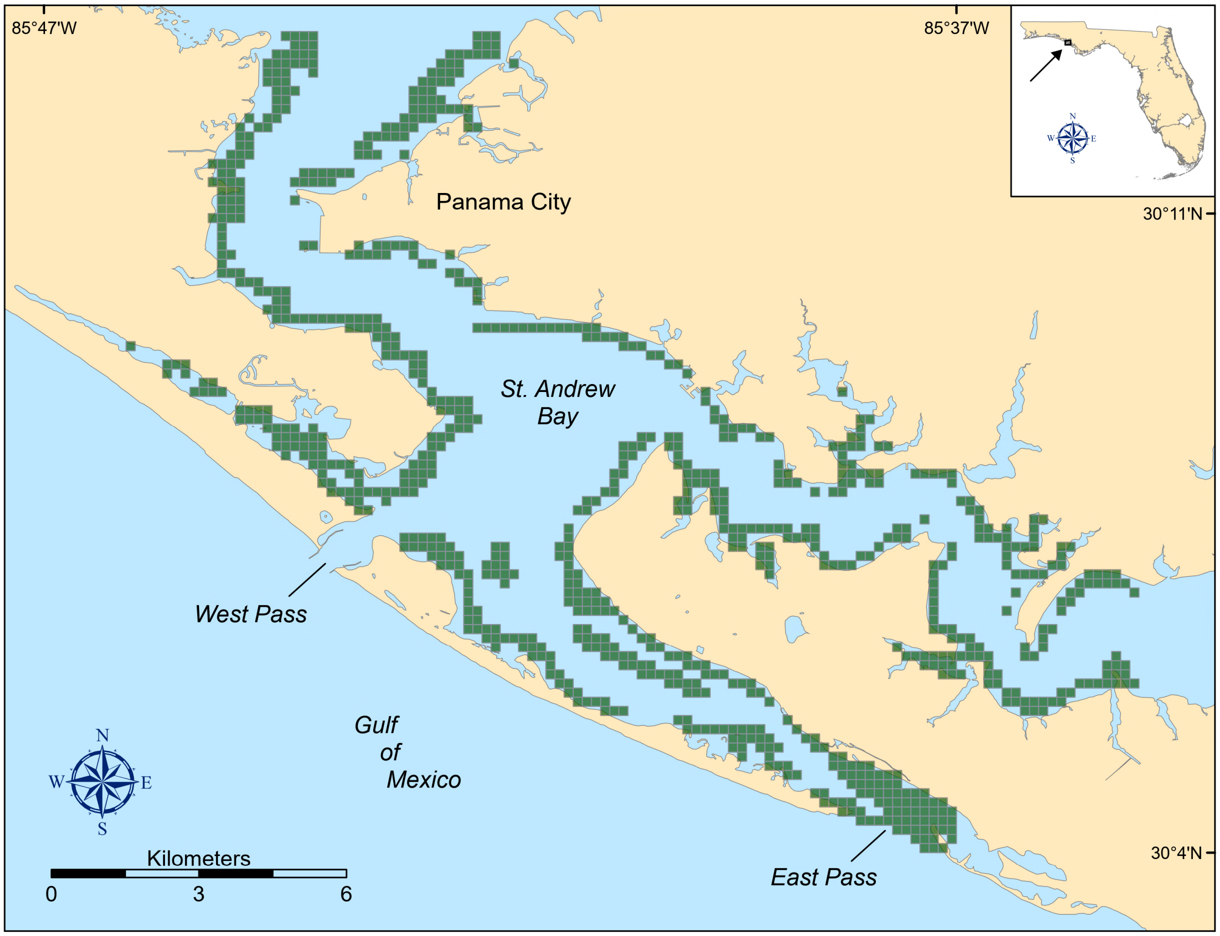

Figure 9.3: St. Andrew Bay polyhaline seagrass habitat sampling universe. Microgrids ($0.1nm^2$) eligible to be sampled are indicated in green. Adjacent areas that met the sampling requirements, but were not necessarily included in the original universe, could be sampled if necessary.

Table 9.5: Catch statistics for 10 dominant taxa collected in 72 6.1-m otter trawl samples during St. Andrew Bay polyhaline seagrass sampling, June-November, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	13,383	63.8	94.4	18.74	2.67	140.05	116.16	65	0.24	10	222
Eucinostomus spp.	2,667	12.7	73.6	4.87	1.77	307.68	111.58	22	0.11	8	39
Orthopristis chrysoptera	2,440	11.6	87.5	4.19	0.52	110.33	19.56	79	0.61	17	187
Bairdiella chrysoura	393	1.9	43.1	0.75	0.19	223.91	10.49	61	1.21	15	140
Paralichthys albigutta	252	1.2	88.9	0.48	0.05	94.84	2.25	116	3.12	30	324
Syngnathus floridae	230	1.1	77.8	0.43	0.06	109.68	2.43	150	2.28	65	274
Syngnathus scovelli	170	0.8	56.9	0.32	0.06	153.50	2.56	102	1.17	44	142
Opsanus beta	125	0.6	47.2	0.24	0.04	158.76	1.75	131	2.44	57	237
Stephanolepis hispida	116	0.6	51.4	0.21	0.04	172.88	2.16	46	1.43	13	97
Callinectes sapidus	108	0.5	44.4	0.21	0.05	191.10	1.95	69	3.09	9	166
Subtotals	19,884	94.8	.	.	.	.	.	.	.	8	324
Totals	**20,961**	**100.0**	**.**	**39.50**	**4.13**	**88.67**	**144.90**	**.**	**.**	**3**	**387**

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.

Table 9.6: Catch statistics for species of interest collected in 72 6.1-m otter trawl samples during St. Andrew Bay polyhaline seagrass sampling, June-November, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Cynoscion nebulosus	98	0.5	33.3	0.17	0.04	189.71	1.80	62	3.87	20	275
Lutjanus griseus	31	0.1	19.4	0.06	0.02	269.69	0.81	65	7.00	24	170
Lutjanus synagris	30	0.1	19.4	0.06	0.02	310.88	0.94	41	4.06	15	83
Mycteroperca microlepis	2	<0.1	2.8	<0.01	<0.01	595.76	0.13	178	37.50	141	216
Totals	**161**	**0.8**	**.**	**0.31**	**0.05**	**151.98**	**1.89**	**.**	**.**	**15**	**275**

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.

9.4 Apalachicola Bay

Apalachicola Bay (Figure 9.4) is a shallow, semi-enclosed estuary, located on the northwestern coast of Florida. The estuary is bounded by a barrier island complex (St. Vincent Island, Little St. George Island, St. George Island, and Dog Island) and connected to the Gulf of Mexico through four passes (Indian Pass, West Pass, East Pass, and Sikes Cut). East of Dog Island, St. George Sound is open to the Gulf. Freshwater inflow to Apalachicola Bay primarily comes from the Apalachicola River and to a lesser extent the Carrabelle River (Livingston 1983). Shoreline vegetation consists largely of marsh grasses, and bottom substrates are typically characterized as sand or mud with oyster beds scattered throughout the bay (Ingle and Dawson 1953). Less than 7% of the substrate is covered by seagrass (Continental Shelf Associates, Inc. 1985b).

Monthly sampling in Apalachicola Bay was completed from June through November with a total of 25,587 individuals collected across 96 samples (Table 8.2). The most abundant taxa collected in Apalachicola Bay polyhaline seagrass sampling were *Lagodon rhomboides* (n=8,885) and *Orthopristis chrysoptera* (n=5,779), accounting for 57.3% of the trawl catch (Table 9.7). The taxa most frequently caught in Apalachicola Bay polyhaline seagrass sampling were *Lagodon rhomboides* (97.9% occurrence) and *Orthopristis chrysoptera* (92.7% occurrence).

A total of 775 animals from 8 species of interest were collected, representing 3% of the entire polyhaline seagrass trawl catch (Table 9.8). *Cynoscion nebulosus* (n=379) was the most abundant species of interest, accounting for 48.9% of the species of interest collected in polyhaline seagrass trawls (Table 9.8). The species of interest most frequently caught in Apalachicola Bay polyhaline seagrass sampling were *Cynoscion nebulosus* (55.2% occurrence) and *Centropristis striata* (54.2% occurrence).

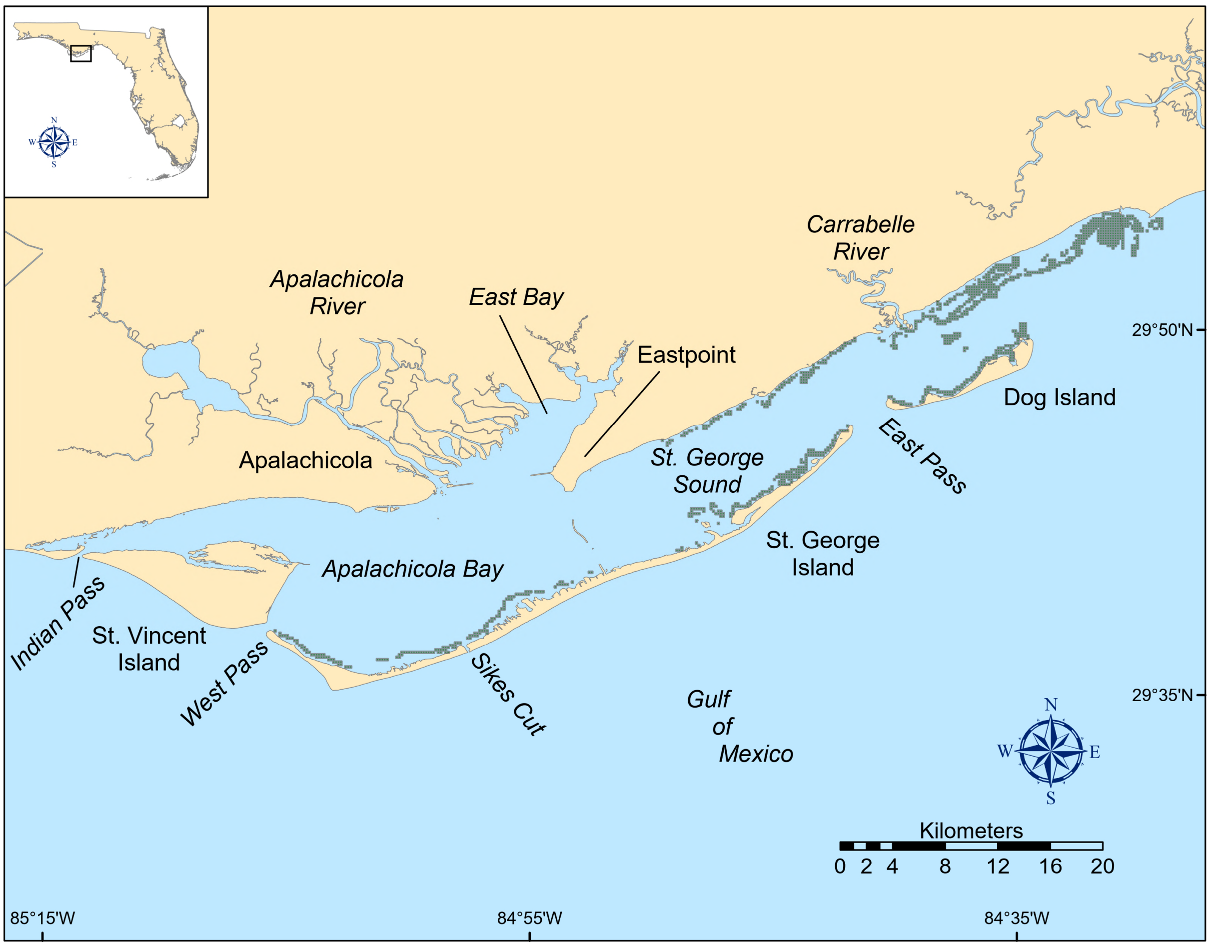

Figure 9.4: Apalachicola Bay polyhaline seagrass habitat sampling universe. Microgrids (0.1nm^2) eligible to be sampled are indicated in green. Adjacent areas that met the sampling requirements, but were not necessarily included in the original universe, could be sampled if necessary.

Table 9.7: Catch statistics for 10 dominant taxa collected in 96 6.1-m otter trawl samples during Apalachicola Bay polyhaline seagrass sampling, June-November, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	8,885	34.7	97.9	9.13	0.97	121.79	56.26	75	0.27	29	180
Orthopristis chrysoptera	5,779	22.6	92.7	5.31	0.77	175.78	86.48	73	0.49	16	201
Bairdiella chrysoura	3,784	14.8	80.2	4.69	0.86	192.28	46.28	55	0.50	8	166
Anchoa mitchilli	975	3.8	22.9	1.42	0.62	424.28	47.09	24	0.28	12	58
Farfantepenaeus spp.	675	2.6	56.2	0.99	0.33	323.40	26.98	10	0.09	4	14
Anchoa spp.	498	1.9	8.3	0.70	0.65	897.98	61.93	15	0.06	9	17
Callinectes sapidus	466	1.8	59.4	0.65	0.12	186.54	8.46	67	1.47	5	173
Eucinostomus spp.	441	1.7	60.4	0.64	0.14	208.69	7.05	25	0.38	10	46
Syngnathus floridae	395	1.5	55.2	0.56	0.10	172.54	4.78	146	1.42	61	204
Stephanolepis hispida	379	1.5	60.4	0.54	0.11	191.64	5.80	59	0.99	12	129
Subtotals	22,277	86.9	.	.	.	.	.	.	.	4	204
Totals	**25,572**	**99.9**	**.**	**36.41**	**3.41**	**91.86**	**207.23**	**.**	**.**	**3**	**393**

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.

Table 9.8: Catch statistics for species of interest collected in 96 6.1-m otter trawl samples during Apalachicola Bay polyhaline seagrass sampling, June-November, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Cynoscion nebulosus	379	1.5	55.2	0.50	0.10	212.77	7.96	43	2.03	10	303
Centropristis striata	249	1.0	54.2	0.36	0.07	197.99	5.53	91	2.68	26	186
Lutjanus synagris	73	0.3	33.3	0.10	0.02	224.62	1.72	37	2.05	14	102
Mycteroperca microlepis	34	0.1	19.8	0.05	0.01	253.06	0.81	162	5.80	114	228
Lutjanus griseus	25	0.1	14.6	0.04	0.01	355.71	1.05	62	8.39	13	169
Sciaenops ocellatus	9	<0.1	8.3	0.01	<0.01	348.12	0.27	243	8.08	201	287
Archosargus probatocephalus	5	<0.1	4.2	0.01	<0.01	514.48	0.27	104	62.23	17	341
Lachnolaimus maximus	1	<0.1	1.0	<0.01	<0.01	979.80	0.13	102	.	102	102
Totals	**775**	**3.0**	**.**	**1.11**	**0.14**	**125.08**	**8.09**	**.**	**.**	**10**	**341**

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.

9.5 Big Bend

The Big Bend is an area along the Gulf Coast of Florida that is considered an open estuary system (Figure 9.5). Freshwater inflow into the estuary comes primarily from the Suwannee River with additional input from many fringing marsh tidal creeks (Lindberg et al. 1992). The shoreline consists largely of marsh grasses, oyster bars, and mud flats. Seagrass meadows primarily occur in the southern portions of the estuary (Tuckey and Dehaven 2006).

Monthly sampling in the Big Bend was completed from June through November with a total of 28,096 individuals collected across 180 samples (Table 8.2). The most abundant taxa collected in Big Bend polyhaline seagrass sampling were *Lagodon rhomboides* (n=13,257) and *Diplodus holbrookii* (n=4,426), accounting for 63% of the trawl catch (Table 9.9). The taxa most frequently caught in Big Bend polyhaline seagrass sampling were *Lagodon rhomboides* (97.8% occurrence) and *Diplodus holbrookii* (87.2% occurrence).

A total of 2,095 animals from 7 species of interest were collected, representing 7.5% of the entire polyhaline seagrass trawl catch (Table 9.10). *Centropristis striata* (n=1,341) was the most abundant species of interest, accounting for 64% of the species of interest collected in polyhaline seagrass trawls (Table 9.10). The species of interest most frequently caught in Big Bend polyhaline seagrass sampling were *Centropristis striata* (87.2% occurrence) and *Haemulon plumierii* (56.7% occurrence).

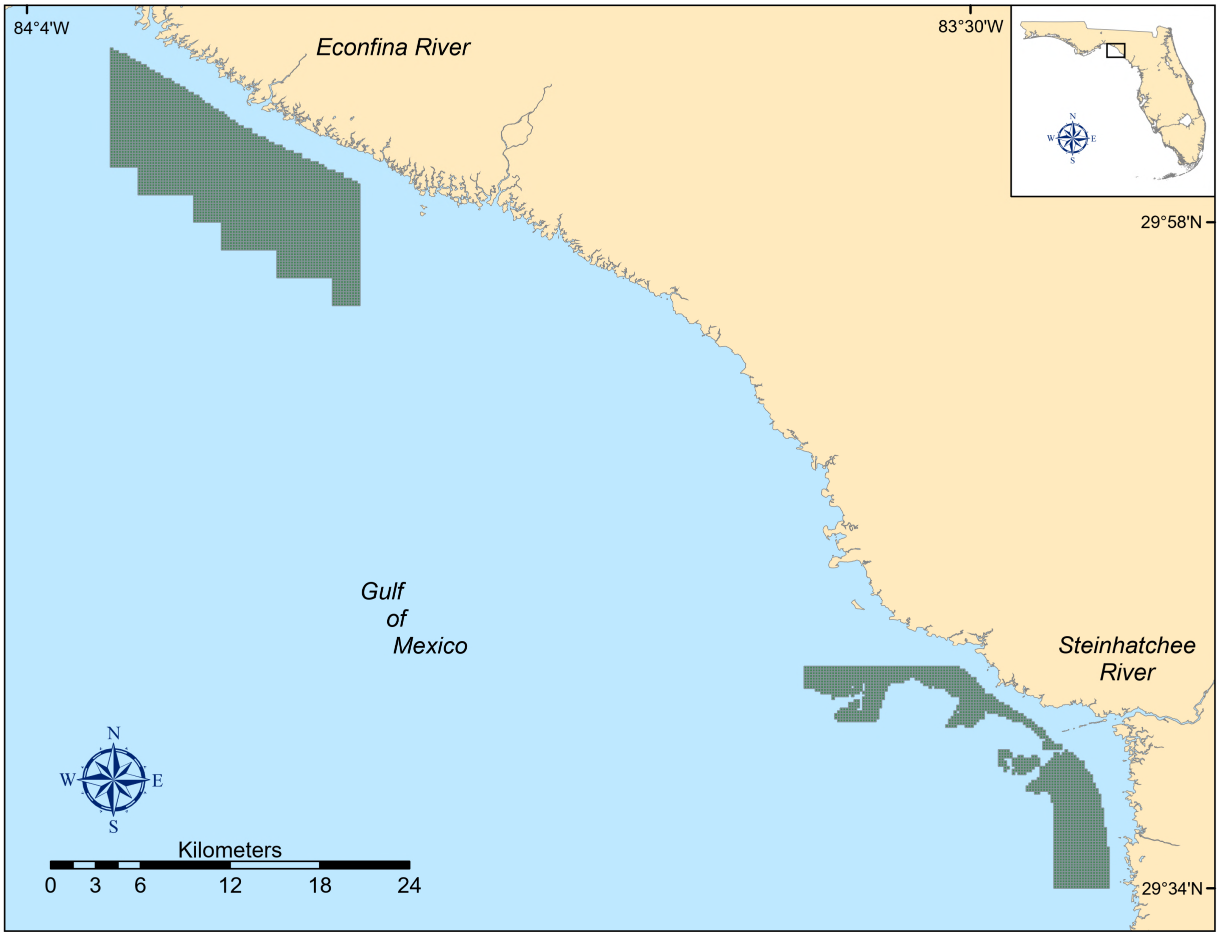

Figure 9.5: Big Bend polyhaline seagrass habitat sampling universe. Microgrids (0.1nm^2) eligible to be sampled are indicated in green. Adjacent areas that met the sampling requirements, but were not necessarily included in the original universe, could be sampled if necessary.

Table 9.9: Catch statistics for 10 dominant taxa collected in 180 6.1-m otter trawl samples during Big Bend polyhaline seagrass sampling, June-November, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	13,257	47.2	97.8	8.58	0.77	138.11	74.88	61	0.18	25	198
Diplodus holbrookii	4,426	15.8	87.2	3.19	0.48	214.80	75.96	53	0.22	28	179
Bairdiella chrysoura	1,401	5.0	69.4	1.25	0.15	162.29	18.21	79	0.83	14	163
Orthopristis chrysoptera	1,618	5.8	80.0	1.24	0.20	226.31	34.67	89	0.94	27	225
Syngnathus floridae	1,378	4.9	87.2	1.21	0.09	103.84	6.07	161	0.71	55	232
Centropristis striata	1,341	4.8	87.2	1.13	0.14	162.00	20.64	90	0.88	28	278
Monacanthus ciliatus	814	2.9	69.4	0.65	0.07	151.14	5.13	46	0.41	11	107
Argopecten irradians	729	2.6	46.1	0.64	0.12	248.17	15.52	54	0.32	6	70
Haemulon plumierii	422	1.5	56.7	0.37	0.04	149.39	3.37	42	0.62	16	80
Opsanus beta	354	1.3	64.4	0.36	0.04	147.58	2.70	140	3.21	14	275
Subtotals	25,740	91.8	.	.	.	.	.	.	.	6	278
Totals	**28,076**	**99.9**	**.**	**24.31**	**1.54**	**84.92**	**164.06**	**.**	**.**	**6**	**885**

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.

Table 9.10: Catch statistics for species of interest collected in 180 6.1-m otter trawl samples during Big Bend polyhaline seagrass sampling, June-November, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	No.	%	% Occur	Mean	Stderr	CV	Max	Mean	Stderr	Min	Max
Centropristis striata	1,341	4.8	87.2	1.13	0.14	162.00	20.64	90	0.88	28	278
Haemulon plumierii	422	1.5	56.7	0.37	0.04	149.39	3.37	42	0.62	16	80
Lutjanus synagris	120	0.4	32.8	0.10	0.02	217.05	1.48	54	2.17	16	101
Cynoscion nebulosus	108	0.4	31.7	0.09	0.01	190.87	1.01	70	3.83	14	188
Lachnolaimus maximus	85	0.3	23.9	0.08	0.01	223.85	0.94	85	2.78	43	153
Mycteroperca microlepis	13	<0.1	4.4	0.01	0.01	591.45	0.81	129	7.77	99	201
Lutjanus griseus	6	<0.1	1.7	0.01	<0.01	886.27	0.54	120	11.79	65	144
Totals	**2,095**	**7.5**	**.**	**1.80**	**0.16**	**117.26**	**21.86**	**.**	**.**	**14**	**278**

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.

9.6 Tampa Bay

Tampa Bay is a drowned river estuary located on the western central coast of Florida (Figure 9.6). The bay is connected to the Gulf of Mexico through two main channels and several smaller passes and channels. Freshwater inflow into the bay comes from over 100 tributaries, although more than 80% enters from four main rivers (Alafia, Hillsborough, Manatee, and Little Manatee; (Schmidt and Luther 2002)). Shoreline vegetation consists largely of mangroves and marsh grasses, and bottom substrates are typically characterized as sand, mud, oysters, or a combination thereof (Flannery 1989). Seagrass meadows are the dominant vegetative cover in Tampa Bay and are widely distributed throughout the bay (Haddad 1989).

Monthly sampling in Tampa Bay was completed from June through November with a total of 42,179 individuals collected across 144 samples (Table 8.2). The most abundant taxa collected in Tampa Bay polyhaline seagrass sampling were *Lagodon rhomboides* (n=24,168) and *Eucinostomus* spp. (n=6,741), accounting for 73.3% of the trawl catch (Table 9.11). The taxa most frequently caught in Tampa Bay polyhaline seagrass sampling were *Lagodon rhomboides* (97.9% occurrence) and *Eucinostomus gula* (87.5% occurrence).

A total of 1,239 animals from 9 species of interest were collected, representing 2.9% of the entire polyhaline seagrass trawl catch (Table 9.12). *Haemulon plumierii* (n=337) was the most abundant species of interest, accounting for 27.2% of the species of interest collected in polyhaline seagrass trawls (Table 9.12). The species of interest most frequently caught in Tampa Bay polyhaline seagrass sampling were *Haemulon plumierii* (47.2% occurrence) and *Lutjanus synagris* (44.4% occurrence).

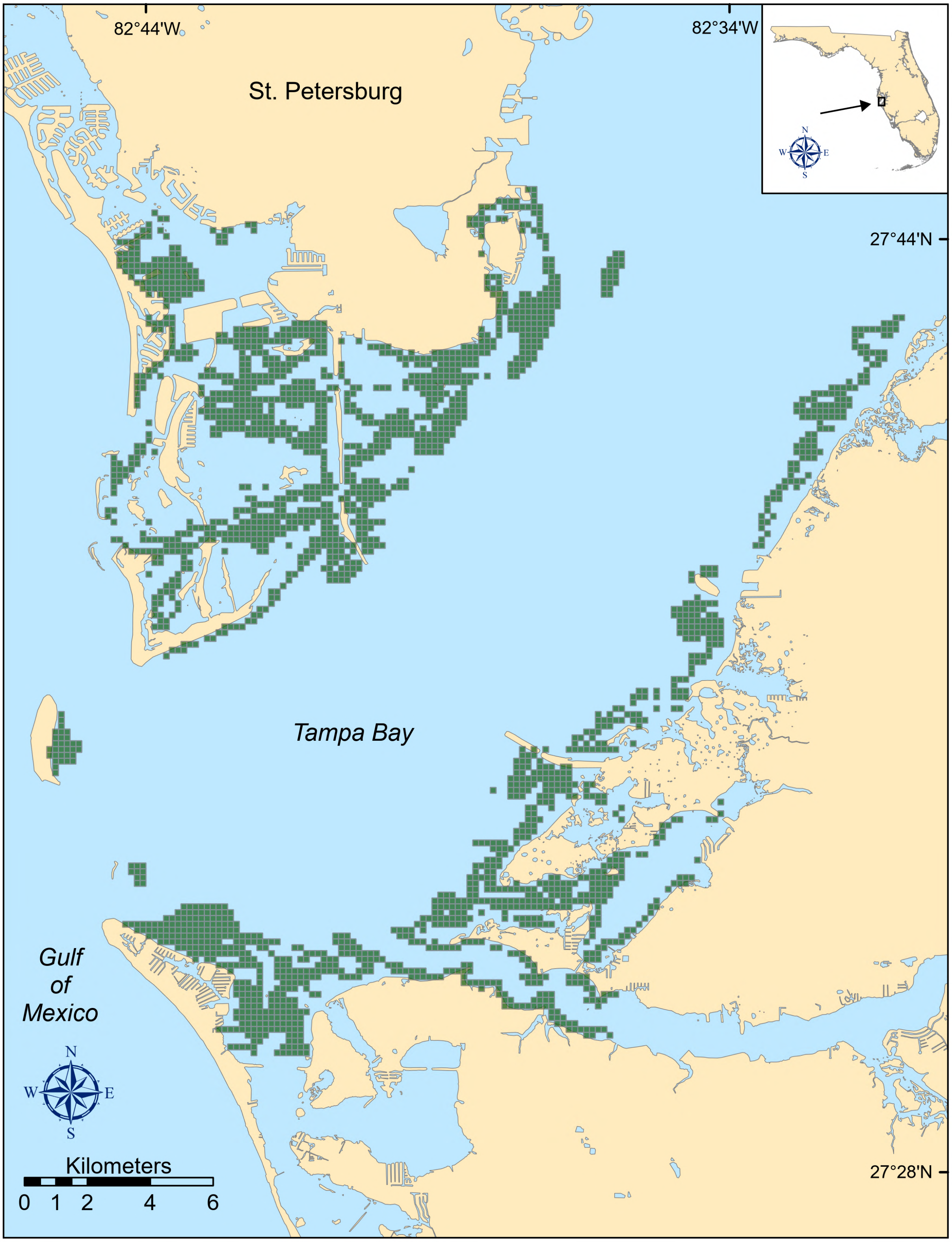

Figure 9.6: Tampa Bay polyhaline seagrass habitat sampling universe. Microgrids ($0.1nm^2$) eligible to be sampled are indicated in green. Adjacent areas that met the sampling requirements, but were not necessarily included in the original universe, could be sampled if necessary.

Table 9.11: Catch statistics for 10 dominant taxa collected in 144 6.1-m otter trawl samples during Tampa Bay polyhaline seagrass sampling, June-November, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	24,168	57.3	97.9	19.95	1.67	109.33	121.12	78	0.15	25	190
Eucinostomus spp.	6,741	16.0	83.3	6.66	1.12	201.73	72.45	26	0.09	9	42
Eucinostomus gula	2,412	5.7	87.5	2.37	0.31	159.53	21.99	61	0.33	40	139
Bairdiella chrysoura	1,745	4.1	67.4	1.60	0.21	160.21	11.87	59	0.62	11	143
Lucania parva	1,000	2.4	22.2	1.02	0.51	604.54	71.36	23	0.13	12	33
Farfantepenaeus duorarum	740	1.8	41.7	0.72	0.27	447.42	30.76	11	0.16	4	33
Stephanolepis hispida	649	1.5	55.6	0.63	0.10	190.59	7.50	63	0.64	13	166
Orthopristis chrysoptera	624	1.5	66.7	0.61	0.13	264.61	17.39	103	0.92	29	197
Chilomycterus schoepfii	562	1.3	79.2	0.54	0.06	124.14	5.13	100	1.72	13	244
Syngnathus floridae	469	1.1	64.6	0.45	0.05	143.49	4.32	171	1.53	57	265
Subtotals	39,110	92.7	.	.	.	.	.	.	.	4	265
Totals	**42,179**	**100.0**	**.**	**41.24**	**2.95**	**85.83**	**180.92**	**.**	**.**	**4**	**450**

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.

Table 9.12: Catch statistics for species of interest collected in 144 6.1-m otter trawl samples during Tampa Bay polyhaline seagrass sampling, June-November, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Haemulon plumierii	337	0.8	47.2	0.32	0.05	189.12	3.30	76	1.46	19	172
Cynoscion nebulosus	314	0.7	40.3	0.31	0.07	288.18	7.08	49	2.39	14	450
Lutjanus synagris	258	0.6	44.4	0.25	0.04	190.75	2.56	73	1.71	16	145
Mycteroperca microlepis	160	0.4	39.6	0.15	0.02	186.03	1.62	164	2.96	81	282
Archosargus probatocephalus	97	0.2	29.2	0.09	0.02	280.19	2.02	103	6.82	28	326
Lutjanus griseus	63	0.1	22.9	0.06	0.01	236.77	0.81	133	6.85	29	265
Epinephelus morio	7	<0.1	2.8	0.01	<0.01	653.20	0.37	120	7.44	103	162
Centropristis striata	2	<0.1	1.4	<0.01	<0.01	846.53	0.13	76	12.00	64	88
Sciaenops ocellatus	1	<0.1	0.7	<0.01	<0.01	1,200.00	0.13	260	.	260	260
Totals	**1,239**	**2.9**	**.**	**1.20**	**0.12**	**115.42**	**7.96**	**.**	**.**	**14**	**450**

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.

9.7 Charlotte Harbor

Charlotte Harbor (Figure 9.7) is a drowned river estuary located on the southwestern coast of Florida (Charlotte Harbor National Estuary program 2000). The bay is connected to the Gulf of Mexico by passes at Boca Grande, San Carlos, and several smaller inlets. Freshwater inflow principally comes from the Peace, Caloosahatchee, and Myakka rivers. Shoreline vegetation consists largely of fringing mangroves, and seagrasses are the dominant bottom vegetation in shallow waters.

Monthly sampling in Charlotte Harbor was completed from June through November with a total of 31,628 individuals collected across 120 samples (Table 8.2). The most abundant taxa collected in Charlotte Harbor polyhaline seagrass sampling were *Lagodon rhomboides* (n=10,585) and *Eucinostomus* spp. (n=6,751), accounting for 54.8% of the trawl catch (Table 9.13). The taxa most frequently caught in Charlotte Harbor polyhaline seagrass sampling were *Lagodon rhomboides* (97.5% occurrence) and *Eucinostomus gula* (93.3% occurrence).

A total of 1,781 animals from 8 species of interest were collected, representing 5.6% of the entire polyhaline seagrass trawl catch (Table 9.14). *Haemulon plumierii* (n=704) was the most abundant species of interest, accounting for 39.5% of the species of interest collected in polyhaline seagrass trawls (Table 9.14). The species of interest most frequently caught in Charlotte Harbor polyhaline seagrass sampling were *Lutjanus synagris* (74.2% occurrence) and *Haemulon plumierii* (53.3% occurrence).

Figure 9.7: Charlotte Harbor polyhaline seagrass habitat sampling universe. Microgrids ($0.1nm^2$) eligible to be sampled are indicated in green. Adjacent areas that met the sampling requirements, but were not necessarily included in the original universe, could be sampled if necessary.

Table 9.13: Catch statistics for 10 dominant taxa collected in 120 6.1-m otter trawl samples during Charlotte Harbor polyhaline seagrass sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Lagodon rhomboides	10,585	33.5	97.5	11.93	0.99	91.33	46.28	90	0.21	21	170
Eucinostomus spp.	6,751	21.3	90.0	7.56	1.54	223.51	147.87	28	0.08	11	39
Eucinostomus gula	3,423	10.8	93.3	3.89	0.46	128.18	26.85	62	0.24	40	112
Lucania parva	1,860	5.9	15.8	2.42	1.56	707.48	160.42	22	0.08	15	37
Bairdiella chrysoura	1,265	4.0	54.2	1.41	0.52	407.09	60.71	62	0.61	12	139
Syngnathus scovelli	702	2.2	58.3	0.81	0.16	221.43	15.52	99	0.69	32	166
Haemulon plumierii	704	2.2	53.3	0.80	0.18	251.80	13.76	68	0.94	17	175
Farfantepenaeus duorarum	705	2.2	54.2	0.78	0.18	245.35	14.84	11	0.15	3	28
Chilomycterus schoepfii	614	1.9	84.2	0.70	0.09	137.34	7.15	101	1.58	11	229
Lutjanus synagris	555	1.8	74.2	0.63	0.09	150.00	6.07	67	1.19	14	183
Subtotals	27,164	85.8	.	.	.	.	.	.	.	3	229
Totals	**31,623**	**100.0**	**.**	**36.21**	**2.83**	**85.58**	**179.71**	**.**	**.**	**3**	**420**

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.

Table 9.14: Catch statistics for species of interest collected in 120 6.1-m otter trawl samples during Charlotte Harbor polyhaline seagrass sampling, 2023.

	Number			Density Estimate (animals/100m^2)				Standard Length (mm)			
Species	**No.**	**%**	**% Occur**	**Mean**	**Stderr**	**CV**	**Max**	**Mean**	**Stderr**	**Min**	**Max**
Haemulon plumierii	704	2.2	53.3	0.80	0.18	251.80	13.76	68	0.94	17	175
Lutjanus synagris	555	1.8	74.2	0.63	0.09	150.00	6.07	67	1.19	14	183
Cynoscion nebulosus	121	0.4	28.3	0.14	0.03	274.17	3.37	58	4.26	17	214
Mycteroperca microlepis	118	0.4	38.3	0.13	0.02	183.02	1.21	174	2.86	112	246
Lutjanus griseus	103	0.3	30.8	0.12	0.02	229.60	1.89	106	6.05	14	240
Archosargus probatocephalus	100	0.3	39.2	0.11	0.02	187.61	1.35	92	4.64	21	254
Epinephelus morio	79	0.2	23.3	0.09	0.02	265.29	1.48	120	1.81	92	180
Centropristis striata	1	<0.1	0.8	<0.01	<0.01	1,095.45	0.13	208	.	208	208
Totals	**1,781**	**5.6**	**.**	**2.02**	**0.28**	**152.80**	**22.26**	**.**	**.**	**14**	**254**

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.

References

Adams, D. H., D. D. Edwards, J. E. Schneider, and A. R. Searles. 2024. Range expansion and population shifts of estuarine fishes in a changing subtropical estuary. Marine Ecology Progress Series 728:221–238.

Addis, D. 2020. The 2020 stock assessment of red drum, *sciaenops ocellatus*, in florida.

Addis, D., S. Allen, H. Christiansen, R. G. Muller, J. Munyandorero, H. O'Farrell, and C. Swanson. 2023. Florida's inshore and nearshore species: 2022 status and trends report. St. Petersburg, FL.

Addis, D., B. Mahmoudi, and J. O'Hop. 2018. The 2016 stock assessment of spotted seatrout, *cynoscion nebulosus*, in florida.

Archambault, J. A., E. L. Wenner, and J. D. Whitaker. 1990. Life history and abundance of blue crab, *callinectes sapidus* rathbun, at charleston harbor, south carolina. Bulletin of Marine Science 46(1):145–158.

Bacheler, N. M., L. M. Paramore, J. A. Buckel, and F. S. Scharf. 2008. Recruitment of juvenile red drum in north carolina: Spatiotemporal patterns of year-class strength and validation of a seine survey. North American Journal of Fisheries Management 28(4):1086–1098.

Bigelow, H. B., and W. C. Schroeder. 1953. Fishes of the Gulf of Maine. U.S. Government Printing Office.

Blewett, D., R. Hensley, and P. Stevens. 2006. Feeding habits of common snook, *centropomus undecimalis*, in charlotte harbor, florida. Gulf and Caribbean Research 18(1):1–14.

Bortone, S. A. 2002. Biology of the spotted seatrout. CRC Press, Boca Raton.

Bradley, K., and C. Houser. 2009. Relative velocity of seagrass blades: Implications for wave attenuation in low-energy environments. Journal of Geophysical Research: Earth Surface 114(F1).

Brewton, R. A., and B. E. Lapointe. 2023. The green macroalga *Caulerpa prolifera* replaces seagrass in a nitrogen enriched, phosphorus limited, urbanized estuary. Ecological Indicators 156:111035.

Brown, J. M., and J. M. Hemming. 2004. Sediment analysis in choctawhatchee bay. Panama City, Florida.

Burns, J. W., A. D. Chapman, E. Messer, and J. Konwinski. 1997. Submerged aquatic vegetation of the lower St. Johns River. Final Report to Florida Department of Environmental Protection. St. Johns River Water Management District, Palatka, Florida.

Caldwell, D. K. 1957. The biology and systematics of the Pinfish, *Lagodon rhomboides* (Linnaeus).

Caldwell, D. K. 1965. Systematics and variation in the sparid fish *archosargus probatocephalus*. Bulletin, Southern California Academy of Sciences 64(2):89100.

Casey, J. P., G. R. Poulakis, and P. W. Stevens. 2007. Habitat use by juvenile gag, *mycteroperca microlepis* (pisces: Serranidae), in subtropical charlotte harbor, florida (USA). Gulf and Caribbean Research 19(1):1–9.

Chagaris, D., D. Addis, and B. Mahmoudi. 2014. The 2014 stock assessment update for striped mullet, *mugil cephalus*. Fish; Wildlife Research Institute, St. Petersburg, FL.

Chagaris, D., B. Mahmoudi, and M. D. Murphy. 2015. The 2015 stock assessment of red drum, *sciaenops ocellatus*, in florida.

Charlotte Harbor National Estuary program. 2000. Comprehensive conservation and management plan. Page 250.

Cloern, J. E., C. Grenz, and L. Vidergar-Lucas. 1995. An empirical model of the phytoplankton chlorophyll: carbon ratio-the conversion factor between productivity and growth rate. Limnology and Oceanography 40(7):1313–1321.

Continental Shelf Associates, Inc. 1985a. Apalachicola Bay study: submersed vegetation assessment of the Apalachicola Bay system. Prepared for the U.S. Army Corps of Engineers, Mobile District. Sea Grant Publication, No. MASGP 84 020.

Continental Shelf Associates, Inc. 1985b. Apalachicola bay study: Submersed vegetation assessment of the apalachicola bay system. Prepared for the u.s. Army corps of engineers, mobile district.

Cooper, W., R. Gandy, and C. Crowley. 2013. A stock assessment for blue crab, *Callinectes sapidus*, in Florida waters through 2012. St. Petersburg, FL.

Coull, B. C. 1985. The use of long-term biological data to generate testable hypotheses. Estuaries 8(2):84–92.

Crabtree, R. E., and D. H. Adams. 1998. Investigations into nearshore and estuarine gamefish abundance, ecology, and life history in florida. Pages 526–566.

Dahlberg, M. D. 1970. Atlantic and Gulf of Mexico menhadens, genus *Brevoortia* (Pisces: Clupeidae). University of Florida.

Daniel, L. B. 1988. Aspects of the biology of juvenile red drum, *sciaenops ocellatus*, and spotted seatrout, *cynoscion nebulosus* (pisces: Sciaenidae) in south carolina. PhD thesis.

DeVries, D. A., C. D. Bedee, C. L. Palmer, and S. A. Bortone. 2002. The demographics and reproductive biology of spotted seatrout, *cynoscion nebulosus*, in six northwest florida estuaries. CRC Press.

Dutka-Gianelli, J., and D. J. Murie. 2001. Age and growth of sheepshead, *archosargus probatocephalus* (pisces: Sparidae), from the northwest coast of florida. Bulletin of Marine Science 68(1):69–83.

Faletti, M. E., D. H. Chacin, J. A. Peake, T. C. MacDonald, and C. D. Stallings. 2019. Population dynamics of pinfish in the eastern gulf of mexico (1998-2016). PLoS One 14(8):e0221131.

FDEP-FMRI. 1995. Fisheries-Independent Monitoring program 1994 annual data summary report. Florida Marine Research Institute, St. Petersburg, Florida.

FDEP-FMRI. 1997. Fisheries-Independent Monitoring program 1996 annual data summary report. Florida Marine Research Institute, St. Petersburg, Florida.

FDEP-FMRI. 1998. Fisheries-Independent Monitoring program 1997 annual data summary report. Florida Marine Research Institute, St. Petersburg, Florida.

FDEP-FMRI. 1999. Fisheries-Independent Monitoring program 1998 annual data summary report. Florida Marine Research Institute, St. Petersburg, Florida.

FDEP-FMRI. 2002. Fisheries-Independent Monitoring program 2001 annual data summary report. Florida Marine Research Institute, St. Petersburg, Florida.

Flaherty, K., and C. Guenther. 2011. Seasonal distribution and abundance of blue crabs (*callinectes sapidus*) in the tampa bay estuary. Gulf of Mexico Science 29(2).

Flaherty-Walia, K. E., T. S. Switzer, B. L. Winner, A. Tyler-Jedlund, and S. F. Keenan. 2015. Improved ability to characterize recruitment of gray snapper in three florida estuaries along the gulf of mexico through targeted sampling of polyhaline seagrass beds. Transactions of the American Fisheries Society 144(5):911–926. Taylor & Francis.

Flannery, M. S. 1989. Tampa and Sarasota Bays: watersheds and tributaries. Pages 18–48 *in* E. D. Esteves, editor. Tampa and Sarasota Bays: Issues, Resources, Status, and Management. US Department of Commerce. Washington, DC.

Florida Fish and Wildlife Conservation Commission. 2022. Public fisheries-dependent monitoring: Commercial fisheries landings summaries.

Fournie, J. W., J. K. Summers, and S. B. Weisberg. 1996. Prevalence of gross pathological abnormalities in estuarine fishes. Transactions of the American Fisheries Society 125(4):581–590.

Futch, C. R. 1966. The florida black mullet. Florida Board of Conservation Marine Laboratory, St. Petersburg, FL.

FWC-FWRI. 2015. Fisheries-independent monitoring program 2015 annual data summary report. St. Petersburg, FL.

FWC-FWRI. 2023. Fisheries-Independent Monitoring program procedure manual. Florida Fish; Wildlife Research Institute, St. Petersburg, Florida.

Gilhen, J., C. G. Gruchy, and D. E. McAllister. 1976. The sheepshead, *archosargus probatocephalus*, and the feather blenny, *hypsoblennius hentzi*, two additions to the canadianantic ichthyofauna. Canadian Field Naturalist 90:4246.

Gilmore, R. G., C. J. Donohoe, and D. W. Cooke. 1983. Observations on the distribution and biology of east-central florida populations of the common snook, *centropomus undecimalis* (bloch). Florida Scientist 46(3/4):313–336.

Goodyear, C. P. 1985. Relationship between reported commercial landings and abundance of young striped bass in Chesapeake Bay, Maryland. Transactions of the American Fisheries Society 114(1):92–96.

Gray, J. D., T. L. King, and R. L. Colura. 1991. Effect of temperature and hypersalinity on hatching success of Spotted Seatrout eggs. The Progressive Fish-Culturist 53(2):81–84.

GulfBase website. 2023.

Gunter, G. 1945. Studies on marine fishes of Texas. Pages 1–190. University of Texas.

Haddad, K. D. 1989. Habitat trends and fisheries in Tampa and Sarasota Bays. Pages 113–128 *in* E. D. Esteves, editor. Tampa and Sarasota Bays: Issues, Resources, Status, and Management. US Department of Commerce. Washington, DC.

Handley, L., D. Altsman, R. DeMay, Gulf of Mexico program, United States Environmental Protection Agency, and Geological Survey. 2007. Seagrass status and trends in the northern Gulf of Mexico, 1940-2002Version 1.0. U.S. Dept. of the Interior, U.S. Geological Survey, Reston, Va.

Hansen, D. J. 1969. Food, growth, migration, reproduction, and abundance of Pinfish, *Lagodon rhomboides*, and Atlantic Croaker, *Micropogon undulatus*, near Pensacola, Florida, 1963-65. Fishery Bulletin 68(1).

Helser, T. E., R. E. Condrey, and J. P. Geaghan. 1993. Spotted Seatrout distribution in four coastal louisiana estuaries. Transactions of the American Fisheries Society 122(1):99–111.

Hoese, H. D., and R. S. Jones. 1963. Seasonality of larger animals in a Texas turtle grass community.

Huguenard, K. D., D. J. Bogucki, D. G. Ortiz-Suslow, N. J. M. Laxague, J. H. MacMahan, T. M. Özgökmen, B. K. Haus, A. J. H. M. Reniers, J. Hargrove, A. v. Soloviev, and H. Graber. 2016. On the nature of the frontal zone of the Choctawhatchee Bay plume in the Gulf of Mexico. Journal of Geophysical Research: Oceans 121(2):1322–1345.

Ingle, R. M., and C. E. Jr. Dawson. 1953. A survey of Apalachicola Bay. Florida State Board of Conservation Marine Laboratory Technical Series, No. 10. 38 pp.

Iversen, E. S., and D. C. Tabb. 1962. Subpopulations based on growth and tagging studies of spotted seatrout, *cynoscion nebulosus*, in florida. Copeia 1962(3):544–548.

Johnson, D. R., and N. A. Funicelli. 1991. Spawning of the red drum in mosquito lagoon, east-central florida. Estuaries 14(1):74–79.

Keppner, E., and L. Keppner. 2001. The st. Andrew bay ecosystem: 'A look to the future'. The

Friends of St. Andrew Bay, 004.

Kilby, J. D. 1948. A preliminary report on the young striped mullet (*mugil cephalus* linnaeus) in two gulf coastal areas of florida. Quarterly Journal of the Florida Academy of Sciences 11(1):7–23.

Leard, R., B. Mahmoudi, H. Blanchet, H. Lazauski, K. Spiller, M. Buchanan, C. Dyer, and W. Keithly. 1995. The striped mullet fishery of the gulf of mexico, united states: A regional management plan. Ocean Springs, MS.

Lindall, W. N. Jr., and C. H. Saloman. 1977. Alteration and destruction of estuaries affecting fishery resources of the Gulf of Mexico. Marine Fisheries Review 39(9):1–7.

Lindberg, W. J., T. M. Bert, and G. P. Genoni. 1992. Alternative hypotheses for low landings in the Cedar Key stone crab (Genus *Menippe*) fishery, 1984-85. Pages 50–57 Proceedings of a workshop on stone crab (Genus *Menippe*) biology and fisheries. Florida Department of Natural Resources. Florida Marine Research Publication Number 50.

Livingston, R. J. 1983. Resource atlas of the Apalachicola estuary. Florida Sea Grant College program. Report 55. 64 pp.

MacDonald, T. C., J. J. Solomon, C. Guenther, R. B. Brodie, and R. H. McMichael. 2009. Assessment of relationships between freshwater inflow and populations of fish and selected macroinvertebrates in the lower st. Johns river, florida. Page 137. St. Petersburg, FL.

Mahmoudi, B. 1997. Status and trends in the florida mullet fishery and an updated stock assessment. St. Petersburg, FL.

Mahmoudi, B. 2005. The 2005 update of the stock assessment for striped mullet, *mugil cephalus*, in florida. Florida Marine Research Institute, St. Petersburg, FL.

Matheson Jr., R. E. 1983. Taxonomic studies of the *Eucinostomus argenteus* complex (Pisces: Gerreidae). PhD thesis, Texas A&M University.

McMichael, R. H., and K. M. Peters. 1989. Early life history of Spotted Seatrout, *Cynoscion nebulosus* (Pisces: Sciaenidae), in Tampa Bay, Florida. Estuaries 12(2):98–110.

Mercer, L. P. 1984. A biological and fisheries profile of Red Drum, *Sciaenops ocellatus*. NC Department of Natural Resources; Community Development, Division of Marine Fisheries, Raleigh, NC.

Meyer, G. H., and J. S. Franks. 1996. Food of Cobia, *Rachycentron canadum*, from the Northcentral Gulf of Mexico. Gulf Research Reports 9.

Middaugh, D. P., M. J. Hemmer, and Y. Lamadrid-Rose. 1986. Laboratory spawning cues in *Menidia beryllina*, and *M. peninsulae* (Pisces, Atherinidae) with notes on survival and growth of larvae at different salinities. Environmental Biology of Fishes 15(2):107–117.

Miller, D. L., M. Thetford, and L. Yager. 2001. Evaluation of sand fence and vegetation for dune building following overwash by hurricane opal on santa rosa island, florida. Journal of Coastal Research 17(4):936–948.

Montgomery, J. L. M., and T. E. Targett. 1992. The nutritional role of seagrass in the diet of the omnivorous Pinfish *Lagodon rhomboides* (L.). Journal of Experimental Marine Biology and Ecology 158(1):37–57.

Moody, W. D. 1949. A study of the natural history of the spotted trout *cynoscion nebulosus*, in the cedar key, florida area. Quarterly Journal of the Florida Academy of Sciences 12(3):147–171.

Munyandorero, J., M. Masi, and S. Allen. 2017. An assessment of the status of sheepshead in florida waters through 2015. Page 202. St. Petersburg, FL.

Munyandorero, J., A. A. Trotter, P. Stevens, and R. G. Muller. 2020. The 2020 stock assessment common snook, *Centropomus undecimalis*. Page 147. Fish; Wildlife Research Institute, St. Petersburg, FL.

Murphy, M. D., A. L. McMillen-Jackson, and B. Mahmoudi. 2007. A stock assessment for blue crab, *Callinectes sapidus*, in Florida waters. St. Petersburg, FL.

Murphy, M. D., and R. G. Taylor. 1990. Reproduction, growth, and mortality of Red Drum *Sciaenops ocellatus* in Florida Waters. Fishery Bulletin 88:531–542.

Murphy, Michael D, D. Chagaris, and D. Addis. 2011. An assessment of the status of spotted seatrout in florida waters through 2009. St. Petersburg, FL.

Murphy, Michael D., and G. A. Nelson. 1999. An update of the stock assessment of the spotted seatrout, *cynoscion nebulosus*. Page 122.

Myers, R. A., and N. G. Cadigan. 1993. Is juvenile natural mortality in marine demersal fish variable? Canadian Journal of Fisheries and Aquatic Sciences 50(8):1591–1598.

Nelson, G. A. 1998. Abundance, growth, and mortality of young-of-the-year pinfish, *lagodon rhomboides*, in three estuaries along the gulf coast of florida. Fishery Bulletin 96(2):315328.

Nelson, G. A., and D. Leffler. 2001. Abundance, spatial distribution, and mortality of young-of-the-year spotted seatrout (*cynoscion nebulosus*) along the gulf coast of florida. Gulf of Mexico Science 19(1).

Nelson, J. A., C. D. Stallings, W. M. Landing, and J. Chanton. 2013. Biomass transfer subsidizes nitrogen to offshore food webs. Ecosystems 16(6):1130–1138.

Northwest Florida Water Management District. 2017b. Choctawhatchee river and bay surface water improvement and management plan. Havana, FL.

Northwest Florida Water Management District. 2017a. Pensacola bay system surface water improvement and management plan. Havana, FL.

Odum, W. E. 1970. Marine food chains. Pages 222–240 *in* J. J. Steele, editor. Oliver; Boyd, Ltd., Edinburgh, Scotland.

Ogren, L., and H. Brusher. 1977. The distribution and abundance of fishes caught with a trawl in the st. Andrew bay system, florida. Gulf of Mexico Science 1(2).

Page, L., C. Bemis, T. Dowling, H. Espinosa-Pérez, L. Findley, C. Gilbert, K. Hartel, R. Lea, N. Mandrak, M. Neighbors, J. Schmitter-Soto, and H. Walker. 2023. Common and scientific names of fishes from the united states, canada, and mexico, 8th edition.

Paperno, R., and R. B. Brodie. 2004. Effects of environmental variables upon the spatial and temporal structure of a fish community in a small, freshwater tributary of the Indian River Lagoon, Florida. Estuarine, Coastal and Shelf Science 61(2):229–241.

Peters, K. M., and R. H. McMichael. 1987. Early life history of the Red Drum, *Sciaenops ocellatus* (Pisces: Sciaenidae), in Tampa Bay, Florida. Estuaries 10(2):92–107.

Purtlebaugh, C. H., C. W. Martin, and M. S. Allen. 2020. Poleward expansion of common snook *centropomus undecimalis* in the northeastern gulf of mexico and future research needs. PLoS one 15(6):e0234083. Public Library of Science San Francisco, CA USA.

R Core Team. 2022. R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria.

Reagan, R. E. 1985. Species profiles. Life histories and environmental requirements of coastal fishes and invertebrates (Gulf of Mexico). Red Drum.

Reyier, E. A., R. H. Lowers, D. M. Scheidt, and D. H. Adams. 2011. Movement patterns of adult Red Drum, *Sciaenops ocellatus*, in shallow Florida lagoons as inferred through autonomous acoustic telemetry. Environmental Biology of Fishes 90(4):343–360.

Rivas, L. R. 1980. Synopsis of knowledge on the taxonomy, biology, distribution, and fishery of the gulf of mexico mullets (pisces: mugilidae). Page 3453. Mississippi-Alabama State Grant Consortium, Ocean Springs, MS.

Rivas, L. R. 1986. Systematic review of the perciform fishes of the genus *centropomus*. Copeia 1986(3):579–611.

Roat, P. M., and C. McKeon. 2010. State of the Bay Report. Sarasota Bay Estuary program.

Rydene, D., and R. Matheson. 2003. Diurnal fish density in relation to seagrass and drift algae cover in tampa bay, florida. Gulf of Mexico Science 21(1).

Scharf, F. S., and K. K. Schlight. 2000. Feeding habits of Red Drum (*Sciaenops ocellatus*) in Galveston Bay, Texas: seasonal diet variation and predator-prey size relationships. Estuaries 23(1):128.

Schmidt, N., and M. E. Luther. 2002. ENSO impacts on salinity in Tampa Bay, Florida. Estuaries 25(5):976–984.

Schrandt, M. N., T. C. Macdonald, B. L. Winner, D. A. Blewett, R. Paperno, G. Onorato, D. A. Gandy, and T. S. Switzer. 2023. Sampling design modifications to a fishery-independent monitoring survey balance the maintenance of long-term data with emerging management needs and funding limitations. Frontiers in Marine Science 10:1199076. Frontiers.

Schrandt, M. N., C. P. Shea, B. N. Kurth, and T. S. Switzer. 2021. Amending survey design to improve statistical inferences: Monitoring recruitment of juvenile reef fish in the eastern gulf of mexico. Fisheries Research 241:106015. Elsevier.

Schrandt, M. N., T. S. Switzer, C. J. Stafford, K. E. Flaherty-Walia, R. Paperno, and R. E. Matheson Jr. 2018. Similar habitats, different communities: Fish and large invertebrate assemblages in eastern gulf of mexico polyhaline seagrasses relate more to estuary morphology than latitude. Estuarine, Coastal and Shelf Science 213:217–229. Elsevier.

Seyoum, S., M. D. Tringali, B. L. Barthel, V. Villanova, C. Puchulutegui, M. C. Davis, and A. C. Alvarez. 2014. Stock boundaries for Spotted Seatrout (*Cynoscion nebulosus*) in Florida based on population genetic structure.

Silliman, B. R., and M. D. Bertness. 2002. A trophic cascade regulates salt marsh primary production. Proceedings of the National Academy of Sciences 99(16):10500–10505.

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

Simmons, E. G., and J. P. Breuer. 1962. A study of redfish, *sciaenops ocellata* linnaeus and black drum, *pogonias cromis* linnaeus. Pages 184–211. University of Texas, University of Texas.

Sindermann, C. J. 1979. Pollution-associated diseases and abnormalities of fish and shellfish: A review. Fish. Bull.; (United States) 76:4.

Sokal, R. R., and F. J. Rohlf. 1969. Biometry : the principles and practice of statistics in biological research. W.H. Freeman, San Francisco.

Solomon, J. J., R. B. Brodie, and G. S. Ehlinger. 2006. Distribution and abundance of fish assemblages and select macroinvertebrates from the lower St. Marys River basin in northeast Florida. Florida Scientist 69(1):1–18.

St. Johns River Water Management District. 1993. Lower St. Johns River basin SWIM plan.

St. Johns River Water Management District. 2000. St. Marys River basin: overview issues and strategies. Florida Fish; Wildlife Research Institute.

Steele, P., and T. Bert. 1994. Population ecology of the blue crab, *callinectes sapidus* rathbun, in a subtropical estuary: Population structure, aspects of reproduction, and habitat partitioning:1–24.

Steele, P., and T. Bert. 1998. The florida blue crab fishery: History, status, and management. Journal of Shellfish Research 17:441–449.

Steward, J. S., R. W. Virnstein, M. A. Lasi, L. J. Morris, J. D. Miller, L. M. Hall, and W. A. Tweedale. 2006. The impacts of the 2004 hurricanes on hydrology, water quality, and seagrass in the central Indian River Lagoon, Florida. Estuaries and Coasts 29(6):954–965.

Stoner, A. W. 1980. Feeding ecology of *lagodon rhomboides* (pisces: Sparidae): Variation and functional responses. Fishery Bulletin 78(2):337.

Switzer, T. S., S. F. Keenan, P. W. Stevens, R. H. McMichael Jr., and T. C. MacDonald. 2015. Incorporating ecology into survey design: Monitoring the recruitment of age-0 gags in the eastern gulf of mexico. North American Journal of Fisheries Management 35(6):1132–1143. Taylor & Francis.

Switzer, T. S., T. C. MacDonald, R. H. McMichael Jr., and S. F. Keenan. 2012. Recruitment of juvenile gags in the eastern gulf of mexico and factors contributing to observed spatial and temporal patterns of estuarine occupancy. Transactions of the American Fisheries Society 141(3):707–719. Taylor & Francis.

Tabb, D. C. 1961. A contribution to the biology of the spotted seatrout, *cynoscion nebulosus* (cuvier), of east-central florida. Page 24. Florida Board of Conservation, Marine Research Laboratory Technical Series 35.

Taylor, R. G., H. J. Grier, and J. A. Whittington. 1998. Spawning rhythms of Common Snook in Florida. Journal of Fish Biology 53(3):502–520.

Taylor, R. G., J. A. Whittington, and H. J. Grier. 1993. Biology of common snook from the east and west coasts of florida. Study 3, sect. 1. Page 151 *in* R. E. Crabtree, T. M. Bert, and R. G. Taylor, editors. Florida Department of Natural Resources.

Taylor, R. G., J. A. Whittington, H. J. Grier, and R. E. Crabtree. 2000. Age, growth, maturation, and protandric sex reversal in common snook, *centropomus undecimalis*, from the east and west coasts of south florida. Fishery Bulletin 98(3):612–612.

Temporary modification of regulations for red drum and snook in southwest florida. 2010, September 15.

Temporary modification of regulations for red drum and snook in southwest florida. 2018, September 26.

Temporary modification of regulations for red drum, snook, and spotted seatrout in a portion of southwest florida. 2021, May 26.

Temporary modification of regulations for red drum, snook, and spotted seatrout in southwest florida. 2019, May 1.

Temporary modification of regulations for red drum, snook, and spotted seatrout in southwest florida. 2020, February 19.

Temporary modification of regulations for red drum, snook, and spotted seatrout in southwest florida. 2022, May 6.

Temporary modification of regulations for red drum, snook, and spotted seatrout in the tampa bay area. 2021, July 16.

Temporary modification of regulations for spotted seatrout in southwest florida. 2019, February 20.

Tringali, M. D., and T. M. Bert. 1996. The genetic stock structure of Common Snook (*Centropomus undecimalis*). Canadian Journal of Fisheries and Aquatic Sciences 53(5):974–984.

Tringali, M. D., S. Seyoum, E. Wallace, and M. Higham. 2004. The distribution of weakfish (*Cynoscion regalis*), sand seatrout (*C. arenarius*), and their hybrids in Florida Atlantic waters. A special report to the Florida Fish and Wildlife Conservation Commission. Florida Fish and Wildlife Research Institute, IHR2004-018.

Tuckey, T. D., and M. Dehaven. 2006. Fish assemblages found in tidal-creek and seagrass habitats in the Suwannee River estuary. Fishery Bulletin 104(1):102–117.

Ulltang, O. 1977. Methods of measuring stock abundance other than by the use of commercial catch and effort data. Documents Techniques FAO sur les Peches (FAO)-Documentos Tecnicos de la FAO sobre la Pesca (FAO).

Venables, W. N., and B. D. Ripley. 2002. Modern applied statistics with s, 4e edition. Springer, New York.

Walters, S., S. Lowerre-Barbieri, J. Bickford, L. Crabtree, and D. Mann. 2007. Preliminary results on seasonal and diel periodicities of a resident *cynoscion nebulosus* spawning aggregation in tampa bay, florida. Pages 295–296 Proceedings of the Gulf and Caribbean Fisheries Institute.

Weinstein, M. P., Jr. ,. K. L. Heck, P. E. Giebel, and J. E. Gates. 1982. The role of herbivory in pinfish (*lagodon rhomboides*): A preliminary investigation. Bulletin of Marine Science 32(3):791–795.

Wilber, D. H. 1994. The influence of Apalachicola River flows on Blue Crab, *Callinectes sapidus*, in north Florida. Fishery Bulletin 92:180–188.

Winner, B. L., D. A. Blewett, R. H. McMichael, and C. B. Guenther. 2010. Relative abundance and distribution of common snook along shoreline habitats of florida estuaries. Transactions of the American Fisheries Society 139(1):62–79.

Wolfe, D. A., M. A. Champ, D. A. Flemer, and A. J. Mearns. 1987. Long-term biological data sets: their role in research, monitoring, and management of estuarine and coastal marine systems. Estuaries 10(3):181–193.

Yarbro, L. A., and P. R. Carlson. 2016. Seagrass Integrated Mapping and Monitoring program Mapping and Monitoring Report No. 2. Florida Fish and Wildlife Conservation Commission Fish and Wildlife Research Institute.

Yokel, B. J. 1966. A contribution to the biology and distribution of the Red Drum, *Sciaenops ocellata*. Master's thesis, University of Miami, Coral Gables, FL.

Young, D. K., M. Buzas, and M. W. Young. 1976. Species densities of macrobenthos associated with seagrass: A field experimental study of predation. Journal of Marine Research 34.

Young, D. K., and M. W. Young. 1977. Ecology of marine benthos. Pages 359–381 *in* B. C. Coull, editor. University of South Carolina Press.

A Fisheries-Independent Monitoring Core Sampling Appendix Tables

A.1 Santa Rosa Sound

Table A.1: Monthly summary of taxa collected during Santa Rosa Sound stratified-random sampling, 2023.

Species	Month							Totals
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=4	E=4	E=4	E=4	E=4	E=4	E=4	E=28
Acanthostracion quadricornis	.	1	.	1	.	1	.	3
Albula sp.	.	1	.	.	.	.	.	1
Alectis ciliaris	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**1**
Archosargus probatocephalus	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**1**
Ariopsis felis	3	21	1	2	.	.	.	27
Bairdiella chrysoura	3	44	.	100	7	3	.	157
***Brevoortia* spp.**	**.**	**.**	**3**	**.**	**.**	**2**	**.**	**5**
Callinectes sapidus	**1**	**3**	**8**	**5**	**.**	**.**	**1**	**18**
Caranx bartholomaei	.	1	.	.	.	.	.	1
Chaetodipterus faber	.	.	2	.	.	.	.	2
Chilomycterus schoepfii	.	14	4	3	4	.	1	26
Cynoscion arenarius	**.**	**.**	**.**	**3**	**.**	**.**	**.**	**3**
Cynoscion nebulosus	**6**	**.**	**3**	**1**	**1**	**14**	**.**	**25**
Diplodus holbrookii	.	2	.	.	.	.	.	2
Dorosoma petenense	.	.	.	.	.	1	.	1
Elops saurus	**1**	**1**	**67**	**58**	**.**	**.**	**.**	**127**
Eucinostomus gula	14	.	4	15	3	.	.	36
Eucinostomus harengulus	1	2	9	20	30	4	7	73
Farfantepenaeus duorarum	**1**	**.**	**.**	**5**	**.**	**.**	**.**	**6**
Fundulus similis	1	.	1	3	.	.	.	5
Gymnura lessae	.	.	.	1	.	.	.	1
Harengula jaguana	.	.	.	2	1	11	.	14
Hypanus sabinus	13	4	24	.	.	6	.	47
Hypanus say	.	.	1	.	.	.	.	1
Hyporhamphus meeki	.	.	4	.	.	.	.	4

Species	Month							Totals
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=4	E=4	E=4	E=4	E=4	E=4	E=4	E=28
Lagodon rhomboides	446	389	723	1,520	328	404	12	3,822
Leiostomus xanthurus	**195**	**79**	**82**	**120**	**6**	**40**	**1**	**523**
Lutjanus griseus	**7**	**22**	**2**	**1**	**.**	**.**	**.**	**32**
Micropogonias undulatus	**.**	**.**	**13**	**57**	**.**	**.**	**2**	**72**
Mugil cephalus	**13**	**8**	**9**	**2**	**10**	**37**	**13**	**92**
Mugil curema	**1**	**1**	**3**	**6**	**26**	**1**	**14**	**52**
Oligoplites saurus	1	.	.	1	.	.	.	2
Opisthonema oglinum	.	4	.	.	.	.	.	4
Opsanus beta	.	8	10	5	3	.	.	26
Orthopristis chrysoptera	14	11	86	175	29	36	.	351
Paralichthys albigutta	**5**	**1**	**5**	**3**	**1**	**1**	**2**	**18**
Peprilus burti	.	.	.	.	.	1	.	1
Pogonias cromis	**.**	**1**	**.**	**.**	**1**	**1**	**.**	**3**
Prionotus scitulus	.	.	1	.	.	.	.	1
Sciaenops ocellatus	**5**	**1**	**6**	**37**	**3**	**18**	**5**	**75**
Scomberomorus maculatus	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**1**
Selene vomer	.	3	.	.	.	.	.	3
Sphoeroides nephelus	.	2	3	2	.	1	.	8
Sphyraena barracuda	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**2**
Strongylura marina	1	2	.	4	3	1	1	12
Synodus foetens	3	.	1	5	3	1	.	13
Totals	**735**	**626**	**1,076**	**2,158**	**459**	**584**	**62**	**5,700**

Effort, or total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.2: Summary by gear and stratum of taxa collected during Santa Rosa Sound stratified-random sampling, 2023.

Species	Gear and Strata		Totals
	183-m haul seine		
	Over	Nonover	
	E=6	E=22	E=28
Acanthostracion quadricornis	.	3	3
Albula sp.	.	1	1
Alectis ciliaris	**.**	**1**	**1**
Archosargus probatocephalus	**.**	**1**	**1**
Ariopsis felis	4	23	27
Bairdiella chrysoura	44	113	157
***Brevoortia* spp.**	**3**	**2**	**5**
Callinectes sapidus	**3**	**15**	**18**
Caranx bartholomaei	.	1	1
Chaetodipterus faber	.	2	2
Chilomycterus schoepfii	1	25	26
Cynoscion arenarius	**.**	**3**	**3**
Cynoscion nebulosus	**2**	**23**	**25**
Diplodus holbrookii	.	2	2
Dorosoma petenense	.	1	1
Elops saurus	**65**	**62**	**127**
Eucinostomus gula	10	26	36
Eucinostomus harengulus	28	45	73
Farfantepenaeus duorarum	**1**	**5**	**6**
Fundulus similis	1	4	5
Gymnura lessae	.	1	1
Harengula jaguana	.	14	14
Hypanus sabinus	3	44	47
Hypanus say	.	1	1
Hyporhamphus meeki	.	4	4
Lagodon rhomboides	1,126	2,696	3,822

Species	Gear and Strata		Totals
	183-m haul seine		
	Over	Nonover	
	E=6	E=22	E=28
Leiostomus xanthurus	**137**	**386**	**523**
Lutjanus griseus	**2**	**30**	**32**
Micropogonias undulatus	**14**	**58**	**72**
Mugil cephalus	**12**	**80**	**92**
Mugil curema	**13**	**39**	**52**
Oligoplites saurus	1	1	2
Opisthonema oglinum	.	4	4
Opsanus beta	.	26	26
Orthopristis chrysoptera	115	236	351
Paralichthys albigutta	**1**	**17**	**18**
Peprilus burti	.	1	1
Pogonias cromis	**.**	**3**	**3**
Prionotus scitulus	.	1	1
Sciaenops ocellatus	**20**	**55**	**75**
Scomberomorus maculatus	**.**	**1**	**1**
Selene vomer	.	3	3
Sphoeroides nephelus	1	7	8
Sphyraena barracuda	**2**	**.**	**2**
Strongylura marina	.	12	12
Synodus foetens	3	10	13
Totals	**1,612**	**4,088**	**5,700**

Sampling with 183-m haul seine was stratified by the presence or absence of overhanging vegetation (’Over’ or ’Nonover’). Effort, or the total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.3: Summary by zone of taxa collected during Santa Rosa Sound stratified-random sampling, 2023.

Species	Zone	Totals
	A	
	E=28	E=28
Acanthostracion quadricornis	3	3
Albula sp.	1	1
Alectis ciliaris	**1**	**1**
Archosargus probatocephalus	**1**	**1**
Ariopsis felis	27	27
Bairdiella chrysoura	157	157
***Brevoortia* spp.**	**5**	**5**
Callinectes sapidus	**18**	**18**
Caranx bartholomaei	1	1
Chaetodipterus faber	2	2
Chilomycterus schoepfii	26	26
Cynoscion arenarius	**3**	**3**
Cynoscion nebulosus	**25**	**25**
Diplodus holbrookii	2	2
Dorosoma petenense	1	1
Elops saurus	**127**	**127**
Eucinostomus gula	36	36
Eucinostomus harengulus	73	73
Farfantepenaeus duorarum	**6**	**6**
Fundulus similis	5	5
Gymnura lessae	1	1
Harengula jaguana	14	14
Hypanus sabinus	47	47
Hypanus say	1	1
Hyporhamphus meeki	4	4
Lagodon rhomboides	3,822	3,822
Leiostomus xanthurus	**523**	**523**

Species	Zone	Totals
	A	
	E=28	E=28
Lutjanus griseus	**32**	**32**
Micropogonias undulatus	**72**	**72**
Mugil cephalus	**92**	**92**
Mugil curema	**52**	**52**
Oligoplites saurus	2	2
Opisthonema oglinum	4	4
Opsanus beta	26	26
Orthopristis chrysoptera	351	351
Paralichthys albigutta	**18**	**18**
Peprilus burti	1	1
Pogonias cromis	**3**	**3**
Prionotus scitulus	1	1
Sciaenops ocellatus	**75**	**75**
Scomberomorus maculatus	**1**	**1**
Selene vomer	3	3
Sphoeroides nephelus	8	8
Sphyraena barracuda	**2**	**2**
Strongylura marina	12	12
Synodus foetens	13	13
Totals	**5,700**	**5,700**

Zone A was located in Santa Rosa Sound. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

A.2 Choctawhatchee Bay

Table A.4: Monthly summary of taxa collected during Choctawhatchee Bay stratified-random sampling, 2023.

Species	Month							Totals
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=5	E=5	E=5	E=5	E=5	E=5	E=5	E=35
Archosargus probatocephalus	**1**	**.**	**.**	**.**	**.**	**.**	**1**	**2**
Ariopsis felis	3	.	.	15	.	2	.	20
Bairdiella chrysoura	.	22	1	145	1	.	.	169
***Brevoortia* spp.**	**1**	**.**	**2**	**1**	**.**	**1**	**.**	**5**
Callinectes sapidus	**3**	**8**	**4**	**2**	**1**	**.**	**.**	**18**
Caranx hippos	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**1**
Caranx latus	.	.	.	.	1	.	.	1
Chilomycterus schoepfii	4	19	1	12	.	13	.	49
Citharichthys spilopterus	11	.	.	.	.	.	.	11
Cynoscion nebulosus	**2**	**.**	**2**	**6**	**.**	**2**	**.**	**12**
Diapterus auratus	.	.	.	1	.	.	.	1
Elops saurus	**1**	**.**	**2**	**2**	**.**	**.**	**.**	**5**
Eucinostomus gula	6	1	.	1	.	3	.	11
Eucinostomus harengulus	61	34	184	50	35	23	5	392
Farfantepenaeus duorarum	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**1**
Fundulus grandis	.	.	.	.	.	.	1	1
Harengula jaguana	.	617	.	25	.	4	.	646
Hypanus sabinus	7	6	57	16	13	3	.	102
Hypanus say	1	1	.	1	.	.	.	3
Hyporhamphus meeki	1	.	.	.	.	.	.	1
Lagodon rhomboides	380	452	1,970	958	429	54	6	4,249
Leiostomus xanthurus	**159**	**67**	**420**	**350**	**96**	**18**	**.**	**1,110**
Litopenaeus setiferus	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Lutjanus griseus	**3**	**1**	**5**	**4**	**1**	**.**	**1**	**15**
Menticirrhus americanus	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**1**

Species	Month							Totals
	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=5	E=5	E=5	E=5	E=5	E=5	E=5	E=35
Micropogonias undulatus	**51**	**19**	**293**	**282**	**.**	**.**	**.**	**645**
Mugil cephalus	**56**	**45**	**107**	**16**	**18**	**21**	**36**	**299**
Mugil curema	**4**	**3**	**56**	**17**	**101**	**24**	**25**	**230**
Mugil spp.	.	.	5	.	.	.	.	5
Mycteroperca microlepis	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**1**
Opisthonema oglinum	.	2	.	1	.	.	.	3
Opsanus beta	.	4	.	1	.	.	.	5
Orthopristis chrysoptera	7	22	124	40	6	.	.	199
Paralichthys albigutta	**13**	**10**	**1**	**3**	**.**	**3**	**2**	**32**
Paralichthys lethostigma	**2**	**.**	**.**	**.**	**.**	**.**	**.**	**2**
Pomatomus saltatrix	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**1**
Prionotus tribulus	.	2	.	.	.	.	.	2
Sciaenops ocellatus	**36**	**19**	**22**	**18**	**11**	**2**	**.**	**108**
Sphoeroides nephelus	.	6	.	3	.	1	.	10
Sphoeroides spengleri	.	.	.	.	.	.	1	1
Strongylura marina	.	.	.	.	4	.	1	5
Strongylura notata	.	.	.	1	.	4	.	5
Synodus foetens	5	2	3	4	.	.	.	14
Trachinotus carolinus	**.**	**.**	**.**	**1**	**1**	**.**	**.**	**2**
Trachinotus falcatus	**3**	**.**	**.**	**.**	**.**	**.**	**6**	**9**
Totals	**821**	**1,363**	**3,260**	**1,979**	**718**	**178**	**86**	**8,405**

Effort, or total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.5: Summary by gear and stratum of taxa collected during Choctawhatchee Bay stratified-random sampling, 2023.

Species	Gear and Strata		Totals
	183-m haul seine		
	Over	Nonover	
	E=11	E=24	E=35
Archosargus probatocephalus	**.**	**2**	**2**
Ariopsis felis	2	18	20
Bairdiella chrysoura	169	.	169
***Brevoortia* spp.**	**2**	**3**	**5**
Callinectes sapidus	**8**	**10**	**18**
Caranx hippos	**.**	**1**	**1**
Caranx latus	.	1	1
Chilomycterus schoepfii	18	31	49
Citharichthys spilopterus	11	.	11
Cynoscion nebulosus	**2**	**10**	**12**
Diapterus auratus	.	1	1
Elops saurus	**1**	**4**	**5**
Eucinostomus gula	4	7	11
Eucinostomus harengulus	29	363	392
Farfantepenaeus duorarum	**.**	**1**	**1**
Fundulus grandis	.	1	1
Harengula jaguana	25	621	646
Hypanus sabinus	53	49	102
Hypanus say	2	1	3
Hyporhamphus meeki	.	1	1
Lagodon rhomboides	956	3,293	4,249
Leiostomus xanthurus	**317**	**793**	**1,110**
Litopenaeus setiferus	**.**	**1**	**1**
Lutjanus griseus	**12**	**3**	**15**
Menticirrhus americanus	**.**	**1**	**1**
Micropogonias undulatus	**136**	**509**	**645**

Species	Gear and Strata		Totals
	183-m haul seine		
	Over	Nonover	
	E=11	E=24	E=35
Mugil cephalus	**127**	**172**	**299**
Mugil curema	**72**	**158**	**230**
Mugil spp.	.	5	5
Mycteroperca microlepis	**1**	**.**	**1**
Opisthonema oglinum	.	3	3
Opsanus beta	4	1	5
Orthopristis chrysoptera	43	156	199
Paralichthys albigutta	**8**	**24**	**32**
Paralichthys lethostigma	**2**	**.**	**2**
Pomatomus saltatrix	**.**	**1**	**1**
Prionotus tribulus	.	2	2
Sciaenops ocellatus	**53**	**55**	**108**
Sphoeroides nephelus	4	6	10
Sphoeroides spengleri	1	.	1
Strongylura marina	.	5	5
Strongylura notata	4	1	5
Synodus foetens	1	13	14
Trachinotus carolinus	**.**	**2**	**2**
Trachinotus falcatus	**9**	**.**	**9**
Totals	**2,076**	**6,329**	**8,405**

Sampling with 183-m haul seine was stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.6: Summary by zone of taxa collected during Choctawhatchee Bay stratified-random sampling, 2023.

Species	Zone		Totals
	B	C	
	E=21	E=14	E=35
Archosargus probatocephalus	**1**	**1**	**2**
Ariopsis felis	6	14	20
Bairdiella chrysoura	168	1	169
***Brevoortia* spp.**	**2**	**3**	**5**
Callinectes sapidus	**15**	**3**	**18**
Caranx hippos	**1**	**.**	**1**
Caranx latus	1	.	1
Chilomycterus schoepfii	46	3	49
Citharichthys spilopterus	11	.	11
Cynoscion nebulosus	**7**	**5**	**12**
Diapterus auratus	1	.	1
Elops saurus	**2**	**3**	**5**
Eucinostomus gula	8	3	11
Eucinostomus harengulus	286	106	392
Farfantepenaeus duorarum	**.**	**1**	**1**
Fundulus grandis	.	1	1
Harengula jaguana	646	.	646
Hypanus sabinus	31	71	102
Hypanus say	1	2	3
Hyporhamphus meeki	1	.	1
Lagodon rhomboides	2,956	1,293	4,249
Leiostomus xanthurus	**468**	**642**	**1,110**
Litopenaeus setiferus	**1**	**.**	**1**
Lutjanus griseus	**15**	**.**	**15**
Menticirrhus americanus	**.**	**1**	**1**
Micropogonias undulatus	**122**	**523**	**645**
Mugil cephalus	**137**	**162**	**299**

Species	Zone		Totals
	B	C	
	E=21	E=14	E=35
Mugil curema	**139**	**91**	**230**
Mugil spp.	.	5	5
Mycteroperca microlepis	**1**	**.**	**1**
Opisthonema oglinum	3	.	3
Opsanus beta	5	.	5
Orthopristis chrysoptera	178	21	199
Paralichthys albigutta	**28**	**4**	**32**
Paralichthys lethostigma	**2**	**.**	**2**
Pomatomus saltatrix	**.**	**1**	**1**
Prionotus tribulus	2	.	2
Sciaenops ocellatus	**81**	**27**	**108**
Sphoeroides nephelus	10	.	10
Sphoeroides spengleri	1	.	1
Strongylura marina	.	5	5
Strongylura notata	4	1	5
Synodus foetens	11	3	14
Trachinotus carolinus	**2**	**.**	**2**
Trachinotus falcatus	**9**	**.**	**9**
Totals	**5,409**	**2,996**	**8,405**

Zones B-C were located in Choctawhatchee Bay. Effort, or the total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

A.3 Apalachicola Bay

Table A.7: Monthly summary of taxa collected during Apalachicola Bay stratified-random sampling, 2023.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=43	E=45	E=49	E=57	E=49	E=45	E=61	E=45	E=49	E=57	E=49	E=45	E=594
Acanthostracion quadricornis	.	.	.	7	.	.	.	.	1	1	.	.	9
Achirus lineatus	.	.	.	.	.	.	.	.	.	.	6	.	6
Alburnops petersoni	21	29	93	19	34	69	444	121	146	223	.	21	1,220
Alburnops texanus	.	.	.	1	5	.	.	.	.	.	.	.	6
Alosa alabamae	.	.	.	.	.	.	.	87	1	.	.	1	89
Alosa chrysochloris	.	.	2	2	.	.	.	.	.	.	.	.	4
Ameiurus catus	.	.	.	.	1	3	4	.	.	.	1	.	9
Ameiurus spp.	.	.	.	.	.	.	2	.	.	.	.	.	2
Anarchopterus criniger	.	.	.	.	.	.	.	1	.	.	.	.	1
Anchoa cubana	.	.	.	.	.	.	1	.	.	.	.	.	1
Anchoa hepsetus	.	.	.	108	6	7	21	2	.	82	122	.	348
Anchoa lyolepis	.	.	.	.	.	.	.	.	.	12	25	.	37
Anchoa mitchilli	430	159	616	644	1,547	1,084	2,585	555	7,268	1,690	24,008	31	40,617
Anchoa spp.	.	.	.	35	.	.	2	.	.	2	.	.	39
Ancylopsetta quadrocellata	2	.	.	6	.	.	3	.	1	2	.	.	14
Archosargus probatocephalus	**.**	**4**	**15**	**8**	**11**	**11**	**8**	**9**	**14**	**12**	**7**	**8**	**107**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=43	E=45	E=49	E=57	E=49	E=45	E=61	E=45	E=49	E=57	E=49	E=45	E=594
Argopecten irradians	.	1	.	1	.	.	.	.	.	.	.	.	2
Ariopsis felis	4	.	4	157	20	184	173	88	131	277	2	.	1,040
Astroscopus y-graecum	.	.	1	1	.	.	.	.	.	.	.	.	2
Bagre marinus	.	.	.	2	3	7	1	.	11	6	.	.	30
Bairdiella chrysoura	4	113	64	125	34	1,414	676	419	685	293	68	47	3,942
Bathygobius soporator	.	.	.	.	.	.	.	.	.	1	.	.	1
***Brevoortia* spp.**	.	342	540	3,397	15	511	278	88	10	.	.	2	5,183
Calamus arctifrons	.	.	.	.	.	1	.	.	.	2	.	.	3
Callinectes sapidus	213	94	101	54	31	33	56	348	76	46	116	73	1,241
Callinectes similis	1	.	21	11	1	.	23	3	3	8	1	3	75
Caranx crysos	.	.	.	.	.	.	.	1	3	1	.	.	5
Caranx hippos	.	.	1	.	.	11	.	6	8	5	.	.	31
Caranx latus	.	.	.	.	.	.	.	.	11	19	5	1	36
Carcharhinus isodon	.	.	.	.	.	.	6	.	.	.	.	.	6
Carcharhinus leucas	.	.	.	.	.	.	.	1	.	.	.	.	1
Centropomus undecimalis	.	.	.	.	.	.	.	.	1	.	.	.	1
Centropristis philadelphica	.	.	.	.	.	.	.	.	.	4	.	.	4
Centropristis striata	.	.	.	7	.	1	.	.	1	10	3	.	22
Chaetodipterus faber	.	.	.	1	.	5	5	6	3	9	.	.	29
Chasmodes saburrae	.	2	.	1	.	.	.	5	1	.	3	.	12

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=43	E=45	E=49	E=57	E=49	E=45	E=61	E=45	E=49	E=57	E=49	E=45	E=594
Chilomycterus schoepfii	.	1	1	12	1	1	12	6	13	.	3	1	51
Chloroscombrus chrysurus	.	.	.	.	10	.	.	1	1	11	.	.	23
Citharichthys macrops	1	.	.	.	1	.	8	.	.	17	1	.	28
Citharichthys spilopterus	.	.	.	.	12	6	6	15	23	10	.	3	75
Citharichthys spp.	2	.	1	.	.	.	.	.	.	1	.	1	5
Clupeiformes spp.	1	.	.	.	.	.	.	.	.	.	.	1	2
Ctenogobius boleosoma	1	8	163	57	21	8	5	42	141	37	133	65	681
Ctenogobius stigmaticus	.	.	.	.	.	.	.	.	.	1	.	.	1
Cyclopsettidae spp.	.	.	.	.	.	.	5	.	.	.	.	.	5
Cynoscion arenarius	**.**	**.**	**.**	**36**	**148**	**93**	**379**	**59**	**617**	**94**	**23**	**.**	**1,449**
Cynoscion nebulosus	**2**	**10**	**10**	**10**	**12**	**20**	**58**	**73**	**299**	**87**	**33**	**50**	**664**
Cynoscion nothus	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**2**
Cyprinella venusta	.	.	1	.	.	.	.	.	.	.	.	.	1
Cyprinodon variegatus	1	1	.	1	9	.	.	3	.	.	2	.	17
Diapterus auratus	.	.	.	.	.	.	.	.	1	.	.	.	1
Diplectrum bivittatum	1	.	.	.	.	.	.	.	.	2	.	.	3
Diplectrum formosum	**.**	**.**	**.**	**.**	**.**	**.**	**3**	**.**	**.**	**5**	**.**	**.**	**8**
Diplectrum sp.	.	.	.	.	.	.	1	.	.	.	.	.	1
Dorosoma cepedianum	.	.	.	5	.	.	.	.	1	1	.	.	7
Dorosoma petenense	11	.	1	.	.	8	3	.	3	.	.	.	26

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=43	E=45	E=49	E=57	E=49	E=45	E=61	E=45	E=49	E=57	E=49	E=45	E=594
Echeneis neucratoides	.	.	.	.	.	.	1	1	.	1	.	.	3
Echeneis sp.	.	.	.	.	.	.	.	.	1	.	.	.	1
Elassoma zonatum	.	.	.	.	.	.	3	.	.	.	.	.	3
Elops saurus	**.**	**12**	**5**	**5**	**2**	**18**	**12**	**23**	**77**	**17**	**.**	**.**	**171**
Enneacanthus gloriosus	.	4	.	1	1	19	11	8	1	.	.	3	48
Esox niger	.	1	1	.	.	.	.	.	.	.	.	.	2
Etropus crossotus	18	.	1	35	.	78	212	64	49	209	56	28	750
Etropus cyclosquamus	.	.	.	2	.	.	9	.	.	28	.	.	39
Etropus sp.	.	.	.	.	.	.	.	.	.	1	.	.	1
Eucinostomus argenteus	.	.	.	.	.	.	3	.	.	3	2	.	8
Eucinostomus gula	3	.	.	2	1	.	21	14	5	55	27	7	135
Eucinostomus harengulus	.	2	.	1	.	5	48	33	23	30	67	32	241
Eucinostomus spp.	1	.	.	.	.	231	333	339	193	178	98	46	1,419
Farfantepenaeus aztecus	**.**	**.**	**.**	**2**	**9**	**4**	**22**	**.**	**7**	**11**	**2**	**.**	**57**
Farfantepenaeus duorarum	**10**	**1**	**4**	**64**	**4**	**8**	**25**	**.**	**1**	**9**	**2**	**1**	**129**
***Farfantepenaeus* spp.**	**60**	**45**	**131**	**255**	**55**	**52**	**230**	**108**	**136**	**43**	**332**	**94**	**1,541**
Fundulus chrysotus	.	3	1	1	.	1	11	8	1	1	1	2	30
Fundulus confluentus	.	.	.	.	.	.	.	.	.	.	9	1	10
Fundulus grandis	.	56	3	28	20	5	.	3	1	2	1	9	128
Fundulus similis	.	12	19	6	10	3	9	58	2	2	36	.	157

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=43	E=45	E=49	E=57	E=49	E=45	E=61	E=45	E=49	E=57	E=49	E=45	E=594
Gambusia holbrooki	.	11	8	.	.	5	1	.	1	.	22	1	49
Gerres cinereus	.	.	.	.	.	.	.	.	.	.	1	1	2
Gobionellus oceanicus	3	1	.	2	.	.	.	.	7	.	.	.	13
Gobiosoma bosc	16	54	25	6	4	1	3	7	4	7	7	7	141
Gobiosoma robustum	3	18	14	28	2	.	2	1	.	.	.	1	69
Gobiosoma spp.	12	18	4	.	.	1	7	3	4	2	5	5	61
Gymnura lessae	.	.	.	6	.	4	.	1	20	8	1	.	40
Halichoeres bivittatus	.	.	.	8	.	.	1	.	.	.	.	.	9
Harengula jaguana	.	.	2	.	.	.	1	61	37	2	16	6	125
Heterandria formosa	.	4	13	.	2	7	6	.	3	.	6	.	41
Hippocampus erectus	.	.	.	5	.	.	4	.	.	.	.	.	9
Hippocampus zosterae	1	4	1	.	.	.	.	3	.	.	.	1	10
Hypanus americanus	.	.	.	.	1	.	.	1	.	1	.	.	3
Hypanus sabinus	9	41	103	275	130	201	179	168	406	158	74	21	1,765
Hypanus say	.	.	1	34	20	13	14	6	53	14	.	.	155
Hypanus sp.	.	.	.	.	.	.	.	.	.	1	.	.	1
Hypleurochilus caudovittatus	1	.	.	.	.	.	.	.	.	.	.	.	1
Hyporhamphus meeki	.	.	.	.	.	21	15	7	.	.	1	.	44
Hyporhamphus spp.	.	.	.	.	.	66	13	.	.	.	.	.	79
Hypsoblennius hentz	3	.	.	.	.	.	.	.	.	.	1	.	4

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=43	E=45	E=49	E=57	E=49	E=45	E=61	E=45	E=49	E=57	E=49	E=45	E=594
Ictaluridae sp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Ictalurus furcatus	.	.	.	.	.	.	2	.	.	.	.	.	2
Ictalurus punctatus	4	.	.	.	.	1	34	.	.	.	.	.	39
Labidesthes vanhyningi	.	1	.	.	.	.	2	.	.	.	.	.	3
Lagodon rhomboides	69	2,758	1,209	4,325	2,597	1,374	1,193	2,728	1,144	1,328	1,210	157	20,092
Larimus fasciatus	.	.	.	.	.	1	1	.	.	.	.	.	2
Leiostomus xanthurus	**612**	**134**	**583**	**350**	**159**	**482**	**251**	**554**	**177**	**201**	**50**	**26**	**3,579**
Lepisosteus oculatus	.	.	1	.	.	3	.	.	.	.	.	.	4
Lepisosteus osseus	.	.	.	1	.	.	.	.	.	1	.	.	2
Lepomis macrochirus	.	9	3	.	1	3	4	.	1	.	.	1	22
Lepomis microlophus	6	12	17	.	4	11	11	16	11	17	13	21	139
Lepomis punctatus	.	11	17	.	3	28	25	9	10	10	14	12	139
Lepomis spp.	.	.	.	.	2	27	2	1	2	1	.	1	36
Leuciscidae sp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Limulus polyphemus	.	.	.	.	1	.	.	.	.	1	.	.	2
Litopenaeus setiferus	**20**	**1**	**.**	**22**	**11**	**240**	**57**	**712**	**1,155**	**2,006**	**1,693**	**66**	**5,983**
Lobotes surinamensis	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**1**	**.**	**.**	**.**	**2**
Lucania goodei	.	9	3	.	1	.	.	.	4	.	.	.	17
Lucania parva	1	56	720	80	298	328	1,976	641	14	9	112	48	4,283
Lutjanus campechanus	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**.**	**.**	**.**	**.**	**2**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=43	E=45	E=49	E=57	E=49	E=45	E=61	E=45	E=49	E=57	E=49	E=45	E=594
Lutjanus griseus	.	.	.	.	1	3	9	8	29	12	3	1	66
Lutjanus synagris	.	.	.	.	.	.	4	2	1	12	.	.	19
Membras martinica	.	.	29	21	22	12	134	6	24	1	1	.	250
Menidia spp.	227	111	75	104	71	288	551	210	443	181	292	39	2,592
***Menippe* spp.**	6	.	.	7	.	.	3	.	.	2	.	.	18
Menticirrhus americanus	1	2	1	11	54	67	49	57	164	112	13	9	540
Menticirrhus littoralis	.	.	1	.	.	.	.	.	4	4	.	.	9
Menticirrhus saxatilis	.	1	18	3	25	.	.	.	.	.	3	.	50
Menticirrhus spp.	.	.	.	1	.	.	1	.	.	.	.	.	2
Microgobius gulosus	8	11	27	60	24	54	40	13	2	1	8	15	263
Microgobius thalassinus	.	.	.	4	.	2	1	.	15	9	2	3	36
Micropogonias undulatus	114	52	1,478	544	203	461	231	270	313	76	255	98	4,095
Micropterus salmoides	1	6	1	271	81	80	16	10	2	4	9	6	487
Monacanthus ciliatus	.	.	.	1	.	.	2	.	.	1	.	2	6
Mugil cephalus	45	822	821	305	76	53	129	114	98	241	241	231	3,176
Mugil curema	2	514	70	6	14	118	21	48	17	50	55	115	1,030
Mullus auratus	.	.	.	1	.	.	.	.	.	.	.	.	1
Mycteroperca microlepis	.	.	.	.	.	.	1	6	2	1	1	.	11
Myrophis punctatus	.	.	.	.	.	.	1	.	.	.	.	.	1
Notemigonus crysoleucas	1	.	.	2	109	26	22	42	6	1	.	2	211

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=43	E=45	E=49	E=57	E=49	E=45	E=61	E=45	E=49	E=57	E=49	E=45	E=594
Ogcocephalus cubifrons	2	.	1	7	.	.	7	1	.	3	3	3	27
Oligoplites saurus	.	.	2	1	1	7	4	14	18	8	.	.	55
Opisthonema oglinum	.	.	2	.	.	.	.	.	11	4	.	.	17
Opsanus beta	.	.	.	3	1	2	.	3	2	.	4	.	15
Orthopristis chrysoptera	1	1	7	1,102	671	347	421	249	117	209	22	9	3,156
Paralichthys albigutta	**12**	**32**	**40**	**70**	**56**	**53**	**25**	**17**	**68**	**36**	**8**	**11**	**428**
Paralichthys lethostigma	**7**	**5**	**6**	**7**	**8**	**8**	**16**	**5**	**3**	**3**	**.**	**3**	**71**
Paralichthys squamilentus	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**
Pareques umbrosus	.	.	.	.	.	.	1	.	.	.	.	.	1
Penaeidae spp.	.	.	3	.	.	.	.	.	2	1	.	.	6
Peprilus burti	1	.	.	.	.	.	.	.	.	.	.	.	1
Peprilus paru	.	.	.	11	.	12	31	.	.	2	.	.	56
Peprilus sp.	1	.	.	.	.	.	.	.	.	.	.	.	1
Poecilia latipinna	.	.	.	.	.	.	.	.	.	.	2	.	2
Pogonias cromis	**.**	**37**	**19**	**61**	**52**	**191**	**11**	**11**	**17**	**27**	**9**	**11**	**446**
Pomatomus saltatrix	**.**	**.**	**.**	**1**	**.**	**2**	**.**	**.**	**2**	**.**	**.**	**.**	**5**
Pomoxis nigromaculatus	.	2	.	.	2	1	2	.	.	.	.	2	9
Porichthys plectrodon	.	.	.	.	.	.	1	.	.	.	.	.	1
Portunus spp.	4	.	.	12	.	1	67	1	.	33	.	1	119
Prionotus longispinosus	.	.	.	1	.	.	.	.	.	.	.	.	1

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=43	E=45	E=49	E=57	E=49	E=45	E=61	E=45	E=49	E=57	E=49	E=45	E=594
Prionotus rubio	.	.	.	.	.	.	3	.	.	2	.	.	5
Prionotus scitulus	14	.	.	9	.	1	35	.	1	9	.	2	71
Prionotus spp.	.	.	.	.	1	.	.	.	1	4	.	1	7
Prionotus tribulus	2	.	2	15	2	.	1	.	4	11	9	6	52
Rachycentron canadum	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**2**
Rhinoptera bonasus	.	.	2	.	3	.	3	.	2	.	.	.	10
Rimapenaeus constrictus	.	.	.	.	.	.	.	.	.	1	.	.	1
Rimapenaeus similis	5	.	.	.	.	.	1	.	.	.	.	.	6
Rimapenaeus spp.	7	1	.	.	.	.	17	.	.	15	4	5	49
Sciaenidae spp.	8	.	.	3	.	.	.	.	.	1	.	.	12
Sciaenops ocellatus	**14**	**47**	**68**	**54**	**71**	**90**	**42**	**52**	**51**	**152**	**185**	**74**	**900**
Scomberomorus maculatus	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**1**
Scorpaena brasiliensis	.	.	.	.	.	.	1	.	.	.	.	.	1
Selene setapinnis	.	.	.	.	.	.	1	.	.	1	.	.	2
Selene vomer	.	.	.	.	.	1	.	.	1	.	.	.	2
Serraniculus pumilio	4	.	.	.	.	.	2	.	.	4	.	.	10
Serranus subligarius	.	.	.	.	.	.	.	1	.	1	.	.	2
Sicyonia dorsalis	1	.	.	1	.	.	.	.	.	.	.	.	2
Sicyonia parri	.	.	.	.	.	.	1	.	.	.	.	.	1
Sicyonia typica	1	.	.	.	.	.	.	.	.	.	.	.	1

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=43	E=45	E=49	E=57	E=49	E=45	E=61	E=45	E=49	E=57	E=49	E=45	E=594
Sparidae sp.	.	.	1	.	.	.	.	.	.	.	.	.	1
Sphoeroides nephelus	1	.	1	2	3	1	3	4	2	1	6	2	26
Sphoeroides spp.	1	.	.	20	29	2	.	.	.	2	3	.	57
Sphyraena barracuda	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**2**	**.**	**3**
Sphyraena borealis	.	.	.	10	.	.	.	.	.	.	.	.	10
Sphyrna tiburo	**.**	**.**	**1**	**1**	**.**	**.**	**.**	**.**	**1**	**2**	**.**	**.**	**5**
Stellifer lanceolatus	.	.	.	.	.	.	29	.	8	24	.	.	61
Stephanolepis hispida	.	.	.	3	1	10	4	.	.	1	.	2	21
Stomolophus meleagris	.	.	.	.	.	869	.	1	12	.	1	.	883
Strongylura marina	.	3	.	1	3	4	2	1	2	.	11	8	35
Strongylura notata	.	.	3	3	.	3	4	3	.	8	3	.	27
Strongylura spp.	.	.	.	6	2	1	.	.	.	.	.	.	9
Strongylura timucu	.	.	.	.	.	.	1	.	.	.	2	.	3
Symphurus plagiusa	21	.	20	29	.	1	23	2	24	21	12	9	162
Syngnathus floridae	.	9	9	8	2	10	3	2	9	9	.	1	62
Syngnathus louisianae	.	.	.	.	1	.	14	6	.	7	1	.	29
Syngnathus scovelli	13	48	23	11	12	16	66	60	41	8	33	18	349
Synodus foetens	.	.	5	19	28	13	42	2	3	20	6	2	140
Trachinotus carolinus	**.**	**.**	**3**	**.**	**2**	**15**	**2**	**4**	**.**	**2**	**.**	**.**	**28**
Trachinotus falcatus	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**1**	**1**	**.**	**2**	**17**	**23**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=43	E=45	E=49	E=57	E=49	E=45	E=61	E=45	E=49	E=57	E=49	E=45	E=594
Trinectes maculatus	7	76	69	31	31	18	201	7	9	17	14	14	494
Urophycis floridana	4	.	1	4	.	.	.	.	.	.	.	.	9
Totals	**2,084**	**5,822**	**7,333**	**13,100**	**6,925**	**9,563**	**11,826**	**8,751**	**14,557**	**8,689**	**29,646**	**1,628**	**119,924**

Effort, or total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.8: Summary by gear and stratum of taxa collected during Apalachicola Bay stratified-random sampling, 2023.

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=72	E=60	E=108	E=84	E=198	E=72	E=594
Acanthostracion quadricornis	.	.	.	.	1	8	9
Achirus lineatus	.	.	6	.	.	.	6
Alburnops petersoni	.	.	.	1,218	.	2	1,220
Alburnops texanus	.	.	.	2	.	4	6
Alosa alabamae	87	.	1	.	1	.	89
Alosa chrysochloris	.	.	.	.	4	.	4
Ameiurus catus	.	.	.	9	.	.	9
Ameiurus spp.	.	.	.	2	.	.	2
Anarchopterus criniger	1	.	.	.	.	.	1
Anchoa cubana	.	.	.	.	.	1	1
Anchoa hepsetus	10	164	76	.	1	97	348
Anchoa lyolepis	8	25	4	.	.	.	37
Anchoa mitchilli	976	1,629	4,120	1,296	66	32,530	40,617
Anchoa spp.	.	.	.	.	.	39	39
Ancylopsetta quadrocellata	.	.	.	.	2	12	14
Archosargus probatocephalus	**3**	**.**	**6**	**.**	**97**	**1**	**107**
Argopecten irradians	**1**	**.**	**.**	**.**	**.**	**1**	**2**
Ariopsis felis	6	115	100	.	385	434	1,040
Astroscopus y-graecum	.	.	2	.	.	.	2
Bagre marinus	.	.	1	.	25	4	30
Bairdiella chrysoura	1,954	23	249	48	1,488	180	3,942
Bathygobius soporator	.	.	.	1	.	.	1
***Brevoortia* spp.**	**103**	**321**	**2,983**	**643**	**852**	**281**	**5,183**
Calamus arctifrons	**.**	**.**	**.**	**.**	**1**	**2**	**3**
Callinectes sapidus	**54**	**86**	**341**	**540**	**84**	**136**	**1,241**
Callinectes similis	1	1	32	.	.	41	75

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=72	E=60	E=108	E=84	E=198	E=72	E=594
Caranx crysos	**.**	**.**	**.**	**.**	**5**	**.**	**5**
Caranx hippos	**.**	**.**	**1**	**.**	**30**	**.**	**31**
Caranx latus	.	.	.	.	36	.	36
Carcharhinus isodon	**.**	**.**	**.**	**.**	**6**	**.**	**6**
Carcharhinus leucas	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Centropomus undecimalis	**.**	**.**	**.**	**1**	**.**	**.**	**1**
Centropristis philadelphica	**.**	**.**	**.**	**.**	**.**	**4**	**4**
Centropristis striata	**4**	**.**	**.**	**.**	**3**	**15**	**22**
Chaetodipterus faber	.	.	.	.	14	15	29
Chasmodes saburrae	8	.	3	.	1	.	12
Chilomycterus schoepfii	1	.	1	.	38	11	51
Chloroscombrus chrysurus	.	.	.	.	12	11	23
Citharichthys macrops	.	1	.	.	15	12	28
Citharichthys spilopterus	.	3	1	.	62	9	75
Citharichthys spp.	.	1	4	.	.	.	5
Clupeiformes spp.	.	1	1	.	.	.	2
Ctenogobius boleosoma	247	39	343	40	.	12	681
Ctenogobius stigmaticus	.	.	.	.	.	1	1
Cyclopsettidae spp.	.	.	.	.	.	5	5
Cynoscion arenarius	**26**	**183**	**255**	**.**	**12**	**973**	**1,449**
Cynoscion nebulosus	**217**	**4**	**114**	**8**	**307**	**14**	**664**
Cynoscion nothus	**.**	**.**	**.**	**.**	**.**	**2**	**2**
Cyprinella venusta	.	.	.	1	.	.	1
Cyprinodon variegatus	.	.	12	.	5	.	17
Diapterus auratus	.	.	.	.	1	.	1
Diplectrum bivittatum	.	.	.	.	.	3	3
Diplectrum formosum	**1**	**1**	**.**	**.**	**.**	**6**	**8**
Diplectrum sp.	.	.	.	.	.	1	1

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=72	E=60	E=108	E=84	E=198	E=72	E=594
Dorosoma cepedianum	.	.	.	.	7	.	7
Dorosoma petenense	5	.	1	.	8	12	26
Echeneis neucratoides	.	.	.	.	3	.	3
Echeneis sp.	.	.	.	.	1	.	1
Elassoma zonatum	.	.	.	3	.	.	3
Elops saurus	**.**	**1**	**.**	**.**	**168**	**2**	**171**
Enneacanthus gloriosus	.	.	.	48	.	.	48
Esox niger	.	.	.	2	.	.	2
Etropus crossotus	.	16	4	.	279	451	750
Etropus cyclosquamus	.	.	.	.	.	39	39
Etropus sp.	.	.	.	.	.	1	1
Eucinostomus argenteus	1	.	1	.	.	6	8
Eucinostomus gula	18	4	23	.	60	30	135
Eucinostomus harengulus	7	7	84	20	83	40	241
Eucinostomus spp.	473	61	674	116	2	93	1,419
Farfantepenaeus aztecus	**1**	**5**	**.**	**.**	**10**	**41**	**57**
Farfantepenaeus duorarum	**11**	**2**	**6**	**.**	**12**	**98**	**129**
***Farfantepenaeus* spp.**	**504**	**94**	**728**	**70**	**40**	**105**	**1,541**
Fundulus chrysotus	.	.	6	24	.	.	30
Fundulus confluentus	.	.	.	10	.	.	10
Fundulus grandis	1	.	37	.	90	.	128
Fundulus similis	.	.	94	.	63	.	157
Gambusia holbrooki	.	1	.	48	.	.	49
Gerres cinereus	.	.	.	.	2	.	2
Gobionellus oceanicus	.	7	.	1	.	5	13
Gobiosoma bosc	6	1	47	78	.	9	141
Gobiosoma robustum	52	4	9	1	.	3	69
Gobiosoma spp.	2	.	19	30	.	10	61

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=72	E=60	E=108	E=84	E=198	E=72	E=594
Gymnura lessae	.	.	4	.	32	4	40
Halichoeres bivittatus	.	.	.	.	.	9	9
Harengula jaguana	60	.	7	.	58	.	125
Heterandria formosa	.	.	.	41	.	.	41
Hippocampus erectus	.	1	.	.	.	8	9
Hippocampus zosterae	9	.	1	.	.	.	10
Hypanus americanus	.	.	.	.	3	.	3
Hypanus sabinus	7	13	18	.	1,679	48	1,765
Hypanus say	3	1	1	.	149	1	155
Hypanus sp.	.	.	1	.	.	.	1
Hypleurochilus caudovittatus	.	.	.	.	.	1	1
Hyporhamphus meeki	18	.	20	.	6	.	44
Hyporhamphus spp.	.	1	78	.	.	.	79
Hypsoblennius hentz	1	.	.	.	.	3	4
Ictaluridae sp.	.	.	.	.	.	1	1
Ictalurus furcatus	.	.	.	.	.	2	2
Ictalurus punctatus	.	.	.	1	.	38	39
Labidesthes vanhyningi	.	.	.	3	.	.	3
Lagodon rhomboides	7,861	584	1,320	49	9,900	378	20,092
Larimus fasciatus	.	1	.	.	.	1	2
Leiostomus xanthurus	**195**	**277**	**608**	**117**	**2,039**	**343**	**3,579**
Lepisosteus oculatus	.	.	.	3	1	.	4
Lepisosteus osseus	.	.	.	.	2	.	2
Lepomis macrochirus	.	.	.	22	.	.	22
Lepomis microlophus	.	.	1	120	.	18	139
Lepomis punctatus	.	.	.	139	.	.	139
Lepomis spp.	.	.	.	36	.	.	36
Leuciscidae sp.	.	.	.	.	.	1	1

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=72	E=60	E=108	E=84	E=198	E=72	E=594
Limulus polyphemus	.	.	1	.	1	.	2
Litopenaeus setiferus	**313**	**98**	**2,233**	**28**	**2,189**	**1,122**	**5,983**
Lobotes surinamensis	**.**	**.**	**.**	**.**	**2**	**.**	**2**
Lucania goodei	.	.	.	17	.	.	17
Lucania parva	2,168	1	1,625	488	.	1	4,283
Lutjanus campechanus	**.**	**.**	**.**	**.**	**.**	**2**	**2**
Lutjanus griseus	**33**	**3**	**14**	**8**	**4**	**4**	**66**
Lutjanus synagris	**4**	**.**	**2**	**.**	**.**	**13**	**19**
Membras martinica	25	118	107	.	.	.	250
Menidia spp.	399	204	1,651	326	12	.	2,592
***Menippe* spp.**	**.**	**.**	**.**	**.**	**2**	**16**	**18**
Menticirrhus americanus	**1**	**102**	**288**	**.**	**72**	**77**	**540**
Menticirrhus littoralis	**.**	**.**	**4**	**.**	**5**	**.**	**9**
Menticirrhus saxatilis	**.**	**4**	**46**	**.**	**.**	**.**	**50**
Menticirrhus spp.	.	.	1	.	.	1	2
Microgobius gulosus	98	9	136	15	3	2	263
Microgobius thalassinus	.	16	2	1	.	17	36
Micropogonias undulatus	**9**	**519**	**1,225**	**3**	**1,531**	**808**	**4,095**
Micropterus salmoides	14	.	13	460	.	.	487
Monacanthus ciliatus	2	2	1	.	.	1	6
Mugil cephalus	**4**	**3**	**1,167**	**1**	**2,001**	**.**	**3,176**
Mugil curema	**.**	**1**	**104**	**.**	**925**	**.**	**1,030**
Mullus auratus	**.**	**.**	**.**	**.**	**.**	**1**	**1**
Mycteroperca microlepis	**1**	**.**	**.**	**.**	**10**	**.**	**11**
Myrophis punctatus	1	.	.	.	.	.	1
Notemigonus crysoleucas	.	.	5	206	.	.	211
Ogcocephalus cubifrons	.	.	.	.	14	13	27
Oligoplites saurus	11	1	23	.	20	.	55

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=72	E=60	E=108	E=84	E=198	E=72	E=594
Opisthonema oglinum	.	.	3	.	14	.	17
Opsanus beta	3	1	1	.	8	2	15
Orthopristis chrysoptera	1,772	252	139	.	455	538	3,156
Paralichthys albigutta	**15**	**25**	**39**	**.**	**304**	**45**	**428**
Paralichthys lethostigma	**.**	**7**	**5**	**9**	**45**	**5**	**71**
Paralichthys squamilentus	**.**	**.**	**.**	**.**	**.**	**1**	**1**
Pareques umbrosus	.	.	.	.	.	1	1
Penaeidae spp.	1	1	4	.	.	.	6
Peprilus burti	.	.	.	.	.	1	1
Peprilus paru	.	.	.	.	43	13	56
Peprilus sp.	.	.	1	.	.	.	1
Poecilia latipinna	.	.	.	2	.	.	2
Pogonias cromis	**5**	**.**	**5**	**.**	**434**	**2**	**446**
Pomatomus saltatrix	**.**	**.**	**.**	**.**	**5**	**.**	**5**
Pomoxis nigromaculatus	.	.	.	8	.	1	9
Porichthys plectrodon	.	.	.	.	.	1	1
Portunus spp.	.	2	4	.	1	112	119
Prionotus longispinosus	.	.	.	.	.	1	1
Prionotus rubio	.	.	.	.	.	5	5
Prionotus scitulus	1	2	2	.	3	63	71
Prionotus spp.	1	.	3	.	.	3	7
Prionotus tribulus	1	8	18	.	4	21	52
Rachycentron canadum	**.**	**.**	**.**	**.**	**2**	**.**	**2**
Rhinoptera bonasus	.	.	.	.	10	.	10
Rimapenaeus constrictus	.	.	.	.	.	1	1
Rimapenaeus similis	.	.	.	.	.	6	6
Rimapenaeus spp.	1	5	6	.	.	37	49
Sciaenidae spp.	1	.	.	.	.	11	12

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=72	E=60	E=108	E=84	E=198	E=72	E=594
Sciaenops ocellatus	**48**	**35**	**130**	**.**	**684**	**3**	**900**
Scomberomorus maculatus	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Scorpaena brasiliensis	.	.	.	.	.	1	1
Selene setapinnis	.	.	.	.	1	1	2
Selene vomer	.	.	.	.	2	.	2
Serraniculus pumilio	.	.	.	.	.	10	10
Serranus subligarius	1	.	.	.	.	1	2
Sicyonia dorsalis	.	.	.	.	.	2	2
Sicyonia parri	.	.	.	.	.	1	1
Sicyonia typica	.	.	.	.	.	1	1
Sparidae sp.	1	.	.	.	.	.	1
Sphoeroides nephelus	8	1	5	.	11	1	26
Sphoeroides spp.	14	10	33	.	.	.	57
Sphyraena barracuda	**.**	**.**	**.**	**.**	**3**	**.**	**3**
Sphyraena borealis	.	.	.	.	.	10	10
Sphyrna tiburo	**.**	**.**	**.**	**.**	**5**	**.**	**5**
Stellifer lanceolatus	.	1	7	.	.	53	61
Stephanolepis hispida	12	1	2	.	1	5	21
Stomolophus meleagris	.	.	.	.	883	.	883
Strongylura marina	1	1	9	.	24	.	35
Strongylura notata	.	1	10	.	16	.	27
Strongylura spp.	1	.	6	2	.	.	9
Strongylura timucu	.	1	2	.	.	.	3
Symphurus plagiusa	1	19	57	1	2	82	162
Syngnathus floridae	52	.	4	.	.	6	62
Syngnathus louisianae	7	2	3	.	.	17	29
Syngnathus scovelli	230	11	25	65	2	16	349
Synodus foetens	9	32	32	.	20	47	140

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=72	E=60	E=108	E=84	E=198	E=72	E=594
Trachinotus carolinus	**.**	**1**	**6**	**.**	**21**	**.**	**28**
Trachinotus falcatus	**.**	**.**	**1**	**.**	**22**	**.**	**23**
Trinectes maculatus	.	2	2	213	31	246	494
Urophycis floridana	1	.	1	.	.	7	9
Totals	**18,213**	**5,180**	**21,661**	**6,644**	**28,100**	**40,126**	**119,924**

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, 183-m haul seine, and 6.1-m otter trawl was not stratified. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.9: Summary by zone of taxa collected during Apalachicola Bay stratified-random sampling, 2023.

Species	Zone			Totals
	A	B	C	
	E=243	E=243	E=108	E=594
Acanthostracion quadricornis	.	9	.	9
Achirus lineatus	.	6	.	6
Alburnops petersoni	.	.	1,220	1,220
Alburnops texanus	.	.	6	6
Alosa alabamae	1	88	.	89
Alosa chrysochloris	4	.	.	4
Ameiurus catus	.	.	9	9
Ameiurus spp.	.	.	2	2
Anarchopterus criniger	.	1	.	1
Anchoa cubana	.	1	.	1
Anchoa hepsetus	227	121	.	348
Anchoa lyolepis	26	11	.	37
Anchoa mitchilli	7,684	2,454	30,479	40,617
Anchoa spp.	2	37	.	39
Ancylopsetta quadrocellata	2	12	.	14
Archosargus probatocephalus	**55**	**51**	**1**	**107**
Argopecten irradians	**.**	**2**	**.**	**2**
Ariopsis felis	614	420	6	1,040
Astroscopus y-graecum	1	1	.	2
Bagre marinus	19	11	.	30
Bairdiella chrysoura	2,420	1,472	50	3,942
Bathygobius soporator	.	.	1	1
***Brevoortia* spp.**	**4,182**	**77**	**924**	**5,183**
Calamus arctifrons	**.**	**3**	**.**	**3**
Callinectes sapidus	**424**	**213**	**604**	**1,241**
Callinectes similis	27	48	.	75
Caranx crysos	**.**	**5**	**.**	**5**

Species	Zone			Totals
	A	B	C	
	E=243	E=243	E=108	E=594
Caranx hippos	**11**	**20**	**.**	**31**
Caranx latus	19	17	.	36
Carcharhinus isodon	**5**	**1**	**.**	**6**
Carcharhinus leucas	**1**	**.**	**.**	**1**
Centropomus undecimalis	**.**	**.**	**1**	**1**
Centropristis philadelphica	**1**	**3**	**.**	**4**
Centropristis striata	**.**	**22**	**.**	**22**
Chaetodipterus faber	16	13	.	29
Chasmodes saburrae	.	12	.	12
Chilomycterus schoepfii	1	50	.	51
Chloroscombrus chrysurus	11	12	.	23
Citharichthys macrops	.	28	.	28
Citharichthys spilopterus	71	3	1	75
Citharichthys spp.	5	.	.	5
Clupeiformes spp.	1	1	.	2
Ctenogobius boleosoma	444	190	47	681
Ctenogobius stigmaticus	1	.	.	1
Cyclopsettidae spp.	.	5	.	5
Cynoscion arenarius	**542**	**104**	**803**	**1,449**
Cynoscion nebulosus	**323**	**322**	**19**	**664**
Cynoscion nothus	**1**	**1**	**.**	**2**
Cyprinella venusta	.	.	1	1
Cyprinodon variegatus	12	5	.	17
Diapterus auratus	1	.	.	1
Diplectrum bivittatum	.	3	.	3
Diplectrum formosum	**.**	**8**	**.**	**8**
Diplectrum sp.	.	1	.	1
Dorosoma cepedianum	7	.	.	7
Dorosoma petenense	24	1	1	26

Species	Zone			Totals
	A	B	C	
	E=243	E=243	E=108	E=594
Echeneis neucratoides	.	3	.	3
Echeneis sp.	1	.	.	1
Elassoma zonatum	.	.	3	3
Elops saurus	**92**	**77**	**2**	**171**
Enneacanthus gloriosus	.	.	48	48
Esox niger	.	.	2	2
Etropus crossotus	468	282	.	750
Etropus cyclosquamus	1	38	.	39
Etropus sp.	1	.	.	1
Eucinostomus argenteus	.	8	.	8
Eucinostomus gula	21	107	7	135
Eucinostomus harengulus	71	114	56	241
Eucinostomus spp.	534	711	174	1,419
Farfantepenaeus aztecus	**44**	**5**	**8**	**57**
Farfantepenaeus duorarum	**72**	**55**	**2**	**129**
***Farfantepenaeus* spp.**	**742**	**698**	**101**	**1,541**
Fundulus chrysotus	6	.	24	30
Fundulus confluentus	.	.	10	10
Fundulus grandis	111	17	.	128
Fundulus similis	59	98	.	157
Gambusia holbrooki	1	.	48	49
Gerres cinereus	1	1	.	2
Gobionellus oceanicus	12	.	1	13
Gobiosoma bosc	52	2	87	141
Gobiosoma robustum	25	43	1	69
Gobiosoma spp.	16	5	40	61
Gymnura lessae	15	25	.	40
Halichoeres bivittatus	.	9	.	9
Harengula jaguana	9	116	.	125

Species	Zone			Totals
	A	B	C	
	E=243	E=243	E=108	E=594
Heterandria formosa	.	.	41	41
Hippocampus erectus	2	7	.	9
Hippocampus zosterae	.	10	.	10
Hypanus americanus	.	3	.	3
Hypanus sabinus	1,057	706	2	1,765
Hypanus say	33	122	.	155
Hypanus sp.	1	.	.	1
Hypleurochilus caudovittatus	.	1	.	1
Hyporhamphus meeki	.	44	.	44
Hyporhamphus spp.	13	66	.	79
Hypsoblennius hentz	.	4	.	4
Ictaluridae sp.	.	.	1	1
Ictalurus furcatus	.	.	2	2
Ictalurus punctatus	.	.	39	39
Labidesthes vanhyningi	.	.	3	3
Lagodon rhomboides	8,238	11,795	59	20,092
Larimus fasciatus	1	1	.	2
Leiostomus xanthurus	**1,971**	**1,447**	**161**	**3,579**
Lepisosteus oculatus	1	.	3	4
Lepisosteus osseus	1	1	.	2
Lepomis macrochirus	.	.	22	22
Lepomis microlophus	1	.	138	139
Lepomis punctatus	.	.	139	139
Lepomis spp.	.	.	36	36
Leuciscidae sp.	.	.	1	1
Limulus polyphemus	.	2	.	2
Litopenaeus setiferus	**4,656**	**952**	**375**	**5,983**
Lobotes surinamensis	**2**	**.**	**.**	**2**
Lucania goodei	.	.	17	17

Species	Zone			Totals
	A	B	C	
	E=243	E=243	E=108	E=594
Lucania parva	3,771	23	489	4,283
Lutjanus campechanus	**.**	**2**	**.**	**2**
Lutjanus griseus	**27**	**27**	**12**	**66**
Lutjanus synagris	**1**	**18**	**.**	**19**
Membras martinica	172	78	.	250
Menidia spp.	1,630	636	326	2,592
***Menippe* spp.**	**4**	**14**	**.**	**18**
Menticirrhus americanus	**299**	**235**	**6**	**540**
Menticirrhus littoralis	**1**	**8**	**.**	**9**
Menticirrhus saxatilis	**28**	**22**	**.**	**50**
Menticirrhus spp.	2	.	.	2
Microgobius gulosus	158	88	17	263
Microgobius thalassinus	30	2	4	36
Micropogonias undulatus	**3,445**	**177**	**473**	**4,095**
Micropterus salmoides	27	.	460	487
Monacanthus ciliatus	.	6	.	6
Mugil cephalus	**2,467**	**708**	**1**	**3,176**
Mugil curema	**627**	**403**	**.**	**1,030**
Mullus auratus	**.**	**1**	**.**	**1**
Mycteroperca microlepis	**4**	**7**	**.**	**11**
Myrophis punctatus	1	.	.	1
Notemigonus crysoleucas	5	.	206	211
Ogcocephalus cubifrons	1	26	.	27
Oligoplites saurus	23	32	.	55
Opisthonema oglinum	6	11	.	17
Opsanus beta	3	12	.	15
Orthopristis chrysoptera	795	2,361	.	3,156
Paralichthys albigutta	**187**	**241**	**.**	**428**
Paralichthys lethostigma	**57**	**3**	**11**	**71**

Species	Zone			Totals
	A	B	C	
	E=243	E=243	E=108	E=594
Paralichthys squamilentus	**.**	**1**	**.**	**1**
Pareques umbrosus	.	1	.	1
Penaeidae spp.	3	3	.	6
Peprilus burti	.	1	.	1
Peprilus paru	6	50	.	56
Peprilus sp.	1	.	.	1
Poecilia latipinna	.	.	2	2
Pogonias cromis	**394**	**50**	**2**	**446**
Pomatomus saltatrix	**.**	**5**	**.**	**5**
Pomoxis nigromaculatus	.	.	9	9
Porichthys plectrodon	1	.	.	1
Portunus spp.	45	74	.	119
Prionotus longispinosus	.	1	.	1
Prionotus rubio	2	3	.	5
Prionotus scitulus	5	66	.	71
Prionotus spp.	7	.	.	7
Prionotus tribulus	34	14	4	52
Rachycentron canadum	**.**	**2**	**.**	**2**
Rhinoptera bonasus	5	5	.	10
Rimapenaeus constrictus	1	.	.	1
Rimapenaeus similis	1	5	.	6
Rimapenaeus spp.	29	19	1	49
Sciaenidae spp.	5	2	5	12
Sciaenops ocellatus	**520**	**377**	**3**	**900**
Scomberomorus maculatus	**.**	**1**	**.**	**1**
Scorpaena brasiliensis	.	1	.	1
Selene setapinnis	2	.	.	2
Selene vomer	1	1	.	2
Serraniculus pumilio	.	10	.	10

Species	Zone			Totals
	A	B	C	
	E=243	E=243	E=108	E=594
Serranus subligarius	.	2	.	2
Sicyonia dorsalis	.	2	.	2
Sicyonia parri	.	1	.	1
Sicyonia typica	.	1	.	1
Sparidae sp.	1	.	.	1
Sphoeroides nephelus	5	21	.	26
Sphoeroides spp.	12	45	.	57
Sphyraena barracuda	**.**	**3**	**.**	**3**
Sphyraena borealis	.	10	.	10
Sphyrna tiburo	**.**	**5**	**.**	**5**
Stellifer lanceolatus	24	37	.	61
Stephanolepis hispida	11	10	.	21
Stomolophus meleagris	.	883	.	883
Strongylura marina	12	23	.	35
Strongylura notata	14	13	.	27
Strongylura spp.	2	5	2	9
Strongylura timucu	3	.	.	3
Symphurus plagiusa	78	72	12	162
Syngnathus floridae	2	60	.	62
Syngnathus louisianae	5	24	.	29
Syngnathus scovelli	146	128	75	349
Synodus foetens	33	107	.	140
Trachinotus carolinus	**4**	**24**	**.**	**28**
Trachinotus falcatus	**2**	**21**	**.**	**23**
Trinectes maculatus	61	40	393	494
Urophycis floridana	.	9	.	9
Totals	**50,764**	**30,819**	**38,341**	**119,924**

Species	Zone			Totals
	A	B	C	
	E=243	E=243	E=108	E=594

Zones A and B were located in Apalachicola Bay, and Zone C encompassed the lower Apalachicola River. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

A.4 Cedar Key

Table A.10: Monthly summary of taxa collected during Cedar Key stratified-random sampling, 2023.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=652
Acanthostracion quadricornis	1	.	.	.	.	.	1	.	.	.	.	.	2
Achirus lineatus	40	.	.	1	.	11	33	9	.	1	.	.	95
Alburnops petersoni	.	.	.	.	.	61	.	.	.	2	.	.	63
Alburnops spp.	.	.	.	3	.	.	.	.	.	.	.	.	3
Alosa alabamae	.	1	.	.	.	.	.	.	.	.	.	.	1
Aluterus schoepfii	.	.	.	.	.	.	2	.	.	.	.	.	2
Ameiurus catus	2	.	2	.	.	.	.	.	.	.	.	.	4
Anchoa cubana	.	.	.	1	.	.	.	.	.	.	.	.	1
Anchoa hepsetus	2	2	.	6	27	5	3	28	2	22	236	.	333
Anchoa mitchilli	122	230	429	452	761	3,096	4,646	1,288	6,864	8,307	2,763	978	29,936
Ancylopsetta quadrocellata	.	1	.	5	1	.	1	.	.	.	.	.	8
Archosargus probatocephalus	**.**	**1**	**2**	**4**	**9**	**4**	**1**	**9**	**24**	**9**	**2**	**5**	**70**
Argopecten irradians	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**2**
Ariopsis felis	19	34	60	91	57	286	136	475	81	450	18	.	1,707
Astroscopus y-graecum	.	1	1	.	.	.	.	.	.	.	.	.	2
Bagre marinus	.	.	1	7	.	22	16	32	22	63	5	.	168

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=652
Bairdiella chrysoura	251	199	151	92	315	256	243	910	106	127	31	.	2,681
Bathygobius soporator	.	.	.	.	.	.	.	9	.	.	3	1	13
***Brevoortia* spp.**	**1**	**77**	**1,317**	**418**	**436**	**46**	**29**	**78**	**22**	**5**	**.**	**.**	**2,429**
Calamus arctifrons	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**1**
Callinectes sapidus	**55**	**68**	**29**	**54**	**12**	**23**	**24**	**48**	**41**	**39**	**171**	**60**	**624**
Callinectes similis	.	.	.	.	.	.	.	1	.	.	.	.	1
Callinectes sp.	.	.	.	.	.	1	.	.	.	.	.	.	1
Caranx hippos	**.**	**.**	**.**	**.**	**.**	**1**	**1**	**1**	**1**	**5**	**.**	**.**	**9**
Caranx latus	.	.	.	.	.	.	.	.	.	2	.	1	3
Carcharhinus leucas	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**.**	**.**	**1**	**3**
Carcharhinus limbatus	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**1**
Centropomus undecimalis	**58**	**10**	**8**	**18**	**31**	**11**	**11**	**15**	**47**	**54**	**13**	**9**	**285**
Centropristis striata	**.**	**.**	**.**	**3**	**.**	**3**	**1**	**2**	**.**	**3**	**.**	**.**	**12**
Chaetodipterus faber	.	.	1	5	2	22	55	43	20	8	1	.	157
Chasmodes saburrae	.	.	.	.	.	.	.	2	1	.	.	1	4
Chilomycterus schoepfii	5	2	1	4	2	2	5	2	1	4	.	1	29
Chloroscombrus chrysurus	.	.	.	.	.	8	2	2	2	7	.	.	21
Citharichthys macrops	4	.	.	5	.	1	3	.	6	.	.	.	19
Ctenogobius boleosoma	.	.	1	.	1	1	.	.	2	.	.	.	5
Ctenogobius smaragdus	.	.	.	1	1	.	.	.	.	.	1	4	7

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=652
Cynoscion arenarius	**1**	**.**	**.**	**10**	**8**	**9**	**842**	**41**	**49**	**115**	**6**	**1**	**1,082**
Cynoscion nebulosus	**9**	**33**	**8**	**1**	**2**	**10**	**6**	**12**	**17**	**27**	**7**	**16**	**148**
Cyprinodon variegatus	17	.	.	.	.	.	.	.	.	.	.	17	34
Decapterus punctatus	.	.	.	1	.	.	.	.	.	.	.	.	1
Diplectrum formosum	**.**	**.**	**.**	**1**	**.**	**.**	**1**	**.**	**.**	**4**	**.**	**.**	**6**
Diplodus holbrookii	.	.	.	.	.	.	.	.	.	.	1	.	1
Dorosoma cepedianum	4	12	16	.	4	5	1	1	1	4	1	9	58
Dorosoma petenense	.	1	7	1	.	1	.	.	.	.	.	.	10
Echeneis neucratoides	1	.	.	2	1	.	3	.	2	1	.	.	10
Elops saurus	**7**	**.**	**19**	**28**	**22**	**31**	**8**	**22**	**42**	**76**	**8**	**3**	**266**
Etropus crossotus	35	29	32	74	.	11	50	34	19	188	29	10	511
Eucinostomus gula	94	3	.	1	.	.	30	50	13	122	124	49	486
Eucinostomus harengulus	3	20	32	10	6	1	126	133	55	60	88	109	643
Eucinostomus spp.	33	32	7	22	.	169	120	269	68	269	235	518	1,742
Farfantepenaeus duorarum	**3**	**.**	**9**	**3**	**11**	**.**	**19**	**.**	**1**	**10**	**3**	**1**	**60**
***Farfantepenaeus* spp.**	**9**	**9**	**14**	**.**	**.**	**3**	**142**	**63**	**39**	**32**	**32**	**17**	**360**
Floridichthys carpio	.	.	.	.	.	.	.	8	2	.	.	.	10
Fundulus confluentus	.	.	.	.	.	.	.	.	.	.	96	1	97
Fundulus grandis	25	33	19	2	.	.	3	19	1	1	70	46	219
Fundulus seminolis	43	13	.	.	1	104	2	3	1	3	186	4	360

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=652
Fundulus similis	32	40	6	5	21	2	41	7	8	5	19	35	221
Fundulus xenicus	.	6	.	1	3	.	2	3	2	.	2	14	33
Gambusia holbrooki	80	1	3	12	.	.	2	11	1	2	799	16	927
Gobiesox strumosus	.	.	1	1	2	.	.	.	.	.	.	.	4
Gobiosoma bosc	22	2	5	7	1	11	4	3	3	1	6	1	66
Gobiosoma robustum	.	.	3	.	.	.	.	2	.	.	1	2	8
Gobiosoma spp.	2	.	.	.	.	8	21	4	2	2	7	.	46
Gymnura lessae	.	.	1	3	.	4	4	6	12	16	.	.	46
Haemulon plumierii	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**2**	**.**	**.**	**3**
Harengula jaguana	.	1	2	4	8	7	456	136	61	756	.	.	1,431
Hemicaranx amblyrhynchus	.	.	.	.	.	.	.	.	.	1	.	.	1
Heterandria formosa	2	.	.	.	.	.	.	.	.	.	8	.	10
Hippocampus erectus	2	.	.	.	.	.	1	.	.	.	.	.	3
Hippocampus zosterae	.	.	.	.	.	.	.	1	.	.	.	1	2
Hypanus americanus	.	.	.	9	.	17	1	2	1	.	.	.	30
Hypanus sabinus	135	149	145	211	66	197	130	296	128	139	74	30	1,700
Hypanus say	.	.	33	260	28	17	1	40	42	43	16	.	480
Hyporhamphus meeki	.	.	.	.	.	.	.	.	1	.	.	.	1
Hyporhamphus spp.	.	.	.	6	3	.	1	.	.	.	.	.	10
Hypsoblennius hentz	.	.	.	.	.	1	.	.	.	.	.	.	1

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=652
Labidesthes vanhyningi	.	.	.	1	1	1	.	6	1	8	1	3	22
Lagocephalus laevigatus	.	.	.	.	.	.	1	.	.	.	.	.	1
Lagodon rhomboides	130	1,242	694	893	343	448	418	390	332	736	274	54	5,954
Leiostomus xanthurus	**229**	**1,278**	**2,029**	**252**	**245**	**134**	**91**	**121**	**78**	**95**	**5**	**1**	**4,558**
Lepisosteus osseus	1	.	1	2	1	1	2	1	8	2	1	3	23
Lepisosteus platyrhincus	.	.	.	.	.	.	1	.	.	1	.	.	2
Lepomis auritus	.	.	.	.	.	1	.	.	.	.	.	.	1
Lepomis macrochirus	.	.	3	1	3	1	.	1	.	1	.	.	10
Lepomis microlophus	.	2	.	.	1	.	.	.	.	.	2	.	5
Lepomis punctatus	16	1	.	1	.	.	.	.	.	.	10	.	28
Lepomis spp.	.	.	.	.	.	.	.	.	.	.	7	.	7
Limulus polyphemus	.	.	10	1	2	.	1	2	1	3	1	1	22
Litopenaeus setiferus	**4**	**15**	**.**	**5**	**.**	**.**	**3**	**66**	**36**	**7**	**19**	**1**	**156**
Lobotes surinamensis	**.**	**.**	**.**	**.**	**1**	**5**	**.**	**.**	**.**	**1**	**.**	**.**	**7**
Lucania goodei	4	1	.	.	.	15	.	.	.	.	14	31	65
Lucania parva	33	19	2	2	2	60	.	.	.	.	142	52	312
Lutjanus griseus	**.**	**.**	**.**	**.**	**1**	**4**	**1**	**6**	**3**	**24**	**5**	**1**	**45**
Lutjanus synagris	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**14**	**.**	**.**	**16**
Membras martinica	.	4	2	7	25	232	59	34	167	13	4	.	547
Menidia spp.	245	192	191	172	275	655	361	228	734	307	611	373	4,344

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=652
***Menippe* spp.**	**1**	**.**	**.**	**8**	**.**	**.**	**1**	**.**	**.**	**3**	**.**	**2**	**15**
Menticirrhus americanus	**1**	**5**	**7**	**12**	**11**	**69**	**261**	**104**	**31**	**195**	**26**	**.**	**722**
Menticirrhus saxatilis	**1**	**.**	**.**	**6**	**11**	**2**	**1**	**.**	**.**	**.**	**1**	**5**	**27**
Microgobius gulosus	.	.	6	.	.	2	8	5	.	.	5	.	26
Microgobius thalassinus	3	.	3	1	.	.	3	.	2	2	2	.	16
Micropogonias undulatus	**1**	**2**	**.**	**28**	**4**	**34**	**8**	**58**	**6**	**21**	**.**	**.**	**162**
Micropterus salmoides	.	.	1	4	1	17	1	1	.	.	.	1	26
Monacanthus ciliatus	.	.	.	.	.	.	1	.	.	.	.	.	1
Mugil cephalus	**294**	**110**	**109**	**70**	**197**	**74**	**83**	**248**	**174**	**60**	**159**	**468**	**2,046**
Mugil curema	**13**	**7**	**4**	**1**	**10**	**5**	**3**	**13**	**14**	**15**	**1**	**55**	**141**
Mugil trichodon	**1**	**.**	**2**	**15**	**32**	**83**	**3**	**.**	**3**	**5**	**3**	**64**	**211**
Notropis maculatus	1	.	.	.	.	.	1	.	.	.	.	.	2
Ogcocephalus cubifrons	16	63	89	89	27	37	29	5	26	31	54	26	492
Oligoplites saurus	.	.	.	3	4	10	27	21	32	33	25	2	157
Opisthonema oglinum	.	.	.	3	5	1	4	.	3	2	.	.	18
Opsanus beta	.	1	2	2	4	.	5	.	.	1	.	.	15
Orthopristis chrysoptera	1	.	27	49	57	60	682	20	11	111	5	1	1,024
Parablennius marmoreus	.	.	.	.	.	2	.	.	.	.	.	.	2
Paralichthys albigutta	**6**	**17**	**29**	**33**	**18**	**19**	**11**	**15**	**12**	**16**	**6**	**3**	**185**
Paralichthys lethostigma	**.**	**.**	**.**	**3**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**4**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=652
Peprilus paru	.	.	.	4	.	5	1	5	.	.	.	.	15
Poecilia latipinna	.	.	1	.	.	.	4	.	.	.	6	.	11
Pogonias cromis	**5**	**18**	**31**	**39**	**10**	**18**	**31**	**70**	**50**	**63**	**25**	**2**	**362**
Pomatomus saltatrix	**.**	**.**	**.**	**8**	**2**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**10**
Portunus spp.	10	4	.	10	5	3	8	1	9	23	2	1	76
Prionotus martis	.	.	.	1	.	.	.	.	.	.	.	1	2
Prionotus scitulus	20	.	3	22	4	11	5	.	9	42	1	1	118
Prionotus tribulus	6	20	5	16	12	5	6	.	1	6	25	3	105
Rachycentron canadum	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Rhinoptera bonasus	1	.	4	16	3	4	7	39	4	1	.	1	80
Rostroraja texana	.	.	.	.	.	.	.	.	.	2	.	.	2
Sciaenops ocellatus	**16**	**34**	**52**	**50**	**54**	**28**	**21**	**24**	**55**	**24**	**98**	**30**	**486**
Selene vomer	.	.	.	.	1	2	.	4	.	8	.	.	15
Sicyonia typica	.	.	.	.	.	.	.	.	1	.	.	.	1
Sphoeroides nephelus	3	3	5	13	52	12	3	.	.	3	14	3	111
Sphoeroides spengleri	.	.	.	.	.	.	.	.	.	.	.	1	1
Sphyraena barracuda	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Sphyrna tiburo	**.**	**1**	**.**	**.**	**1**	**2**	**.**	**2**	**.**	**3**	**2**	**.**	**11**
Stephanolepis hispida	.	.	.	.	16	.	9	.	.	.	.	.	25
Strongylura marina	1	1	.	1	3	6	2	.	3	4	5	2	28

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=61	E=51	E=51	E=652
Strongylura notata	.	.	.	1	.	.	1	.	3	1	1	3	10
Strongylura spp.	.	.	.	4	4	1	2	1	1	.	.	.	13
Strongylura timucu	.	1	.	.	1	.	.	1	2	1	2	.	8
Symphurus plagiusa	5	5	3	30	2	1	25	5	6	49	22	5	158
Syngnathus floridae	.	.	.	1	.	.	9	14	.	.	2	.	26
Syngnathus louisianae	.	.	.	.	.	.	1	.	.	4	.	.	5
Syngnathus scovelli	9	.	2	1	2	4	1	11	3	1	5	4	43
Synodus foetens	1	.	3	5	17	11	11	1	2	8	4	1	64
Trachinotus carolinus	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**2**
Trachinotus falcatus	**2**	**1**	**.**	**1**	**.**	**.**	**20**	**1**	**52**	**1**	**4**	**9**	**91**
Trinectes maculatus	6	.	.	62	2	3	2	5	23	17	8	1	129
Urophycis floridana	1	.	.	.	.	.	.	.	.	.	.	.	1
Totals	**2,206**	**4,057**	**5,685**	**3,795**	**3,315**	**6,557**	**9,471**	**5,654**	**9,712**	**12,956**	**6,672**	**3,177**	**73,257**

Effort, or total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.11: Summary by gear and stratum of taxa collected during Cedar Key stratified-random sampling, 2023.

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=19	E=126	E=107	E=168	E=192	E=40	E=652
Acanthostracion quadricornis	.	.	.	.	.	2	2
Achirus lineatus	.	1	9	85	.	.	95
Alburnops petersoni	.	.	.	63	.	.	63
Alburnops spp.	.	.	.	3	.	.	3
Alosa alabamae	.	.	.	.	1	.	1
Aluterus schoepfii	1	.	.	.	.	1	2
Ameiurus catus	.	.	.	.	4	.	4
Anchoa cubana	.	.	.	.	.	1	1
Anchoa hepsetus	236	18	51	26	.	2	333
Anchoa mitchilli	18	4,992	7,905	13,602	.	3,419	29,936
Ancylopsetta quadrocellata	.	.	.	.	2	6	8
Archosargus probatocephalus	**.**	**.**	**.**	**1**	**69**	**.**	**70**
Argopecten irradians	**.**	**.**	**.**	**.**	**1**	**1**	**2**
Ariopsis felis	1	402	10	5	894	395	1,707
Astroscopus y-graecum	.	.	2	.	.	.	2
Bagre marinus	.	25	8	.	121	14	168
Bairdiella chrysoura	26	119	56	1,171	1,073	236	2,681
Bathygobius soporator	.	.	.	13	.	.	13
***Brevoortia* spp.**	**.**	**145**	**598**	**1,547**	**139**	**.**	**2,429**
Calamus arctifrons	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Callinectes sapidus	**5**	**106**	**61**	**307**	**135**	**10**	**624**
Callinectes similis	1	.	.	.	.	.	1
Callinectes sp.	.	1	.	.	.	.	1
Caranx hippos	**.**	**.**	**.**	**.**	**9**	**.**	**9**
Caranx latus	.	.	.	.	3	.	3
Carcharhinus leucas	**.**	**.**	**.**	**.**	**3**	**.**	**3**

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=19	E=126	E=107	E=168	E=192	E=40	E=652
Carcharhinus limbatus	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Centropomus undecimalis	**.**	**.**	**1**	**1**	**283**	**.**	**285**
Centropristis striata	**5**	**.**	**1**	**.**	**1**	**5**	**12**
Chaetodipterus faber	.	5	22	.	108	22	157
Chasmodes saburrae	2	.	2	.	.	.	4
Chilomycterus schoepfii	1	4	2	.	13	9	29
Chloroscombrus chrysurus	.	3	1	.	10	7	21
Citharichthys macrops	.	1	.	.	6	12	19
Ctenogobius boleosoma	.	.	1	4	.	.	5
Ctenogobius smaragdus	.	1	1	5	.	.	7
Cynoscion arenarius	**.**	**58**	**162**	**97**	**4**	**761**	**1,082**
Cynoscion nebulosus	**1**	**.**	**19**	**15**	**108**	**5**	**148**
Cyprinodon variegatus	.	.	21	13	.	.	34
Decapterus punctatus	.	.	.	.	.	1	1
Diplectrum formosum	**.**	**1**	**.**	**.**	**.**	**5**	**6**
Diplodus holbrookii	.	.	.	.	1	.	1
Dorosoma cepedianum	.	.	.	.	58	.	58
Dorosoma petenense	.	.	.	.	10	.	10
Echeneis neucratoides	.	.	.	.	7	3	10
Elops saurus	**.**	**.**	**.**	**.**	**266**	**.**	**266**
Etropus crossotus	1	15	5	1	212	277	511
Eucinostomus gula	6	7	157	93	167	56	486
Eucinostomus harengulus	4	37	267	243	82	10	643
Eucinostomus spp.	72	33	421	1,214	1	1	1,742
Farfantepenaeus duorarum	**.**	**6**	**2**	**.**	**22**	**30**	**60**
***Farfantepenaeus* spp.**	**22**	**73**	**96**	**46**	**4**	**119**	**360**
Floridichthys carpio	.	.	10	.	.	.	10
Fundulus confluentus	.	.	.	97	.	.	97

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=19	E=126	E=107	E=168	E=192	E=40	E=652
Fundulus grandis	.	1	81	131	6	.	219
Fundulus seminolis	.	.	.	360	.	.	360
Fundulus similis	.	2	147	56	16	.	221
Fundulus xenicus	.	.	1	32	.	.	33
Gambusia holbrooki	.	.	.	927	.	.	927
Gobiesox strumosus	.	1	1	2	.	.	4
Gobiosoma bosc	.	3	2	61	.	.	66
Gobiosoma robustum	1	1	4	2	.	.	8
Gobiosoma spp.	.	4	1	41	.	.	46
Gymnura lessae	.	1	.	.	43	2	46
Haemulon plumierii	**1**	**2**	**.**	**.**	**.**	**.**	**3**
Harengula jaguana	.	474	829	14	107	7	1,431
Hemicaranx amblyrhynchus	.	.	.	.	.	1	1
Heterandria formosa	.	.	.	10	.	.	10
Hippocampus erectus	.	.	.	.	.	3	3
Hippocampus zosterae	1	1	.	.	.	.	2
Hypanus americanus	.	.	1	.	29	.	30
Hypanus sabinus	.	31	22	1	1,552	94	1,700
Hypanus say	.	.	1	.	476	3	480
Hyporhamphus meeki	.	.	.	.	1	.	1
Hyporhamphus spp.	.	8	2	.	.	.	10
Hypsoblennius hentz	.	1	.	.	.	.	1
Labidesthes vanhyningi	.	.	.	22	.	.	22
Lagocephalus laevigatus	.	.	.	.	.	1	1
Lagodon rhomboides	343	674	480	1,401	2,820	236	5,954
Leiostomus xanthurus	**1**	**595**	**1,353**	**1,938**	**647**	**24**	**4,558**
Lepisosteus osseus	.	.	.	1	21	1	23
Lepisosteus platyrhincus	.	.	.	1	1	.	2

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=19	E=126	E=107	E=168	E=192	E=40	E=652
Lepomis auritus	.	.	.	1	.	.	1
Lepomis macrochirus	.	.	.	10	.	.	10
Lepomis microlophus	.	.	.	5	.	.	5
Lepomis punctatus	.	.	.	28	.	.	28
Lepomis spp.	.	.	.	7	.	.	7
Limulus polyphemus	.	3	1	.	18	.	22
Litopenaeus setiferus	**.**	**5**	**34**	**62**	**54**	**1**	**156**
Lobotes surinamensis	**.**	**.**	**.**	**.**	**7**	**.**	**7**
Lucania goodei	.	.	.	65	.	.	65
Lucania parva	.	1	.	311	.	.	312
Lutjanus griseus	**.**	**5**	**4**	**5**	**31**	**.**	**45**
Lutjanus synagris	**2**	**3**	**.**	**.**	**2**	**9**	**16**
Membras martinica	3	407	74	63	.	.	547
Menidia spp.	3	148	2,490	1,703	.	.	4,344
***Menippe* spp.**	**.**	**4**	**.**	**.**	**.**	**11**	**15**
Menticirrhus americanus	**.**	**77**	**421**	**10**	**59**	**155**	**722**
Menticirrhus saxatilis	**.**	**10**	**15**	**1**	**1**	**.**	**27**
Microgobius gulosus	2	5	3	16	.	.	26
Microgobius thalassinus	.	12	4	.	.	.	16
Micropogonias undulatus	**.**	**4**	**27**	**.**	**124**	**7**	**162**
Micropterus salmoides	.	.	.	26	.	.	26
Monacanthus ciliatus	1	.	.	.	.	.	1
Mugil cephalus	**.**	**1**	**45**	**83**	**1,917**	**.**	**2,046**
Mugil curema	**.**	**.**	**9**	**2**	**130**	**.**	**141**
Mugil trichodon	**.**	**1**	**80**	**1**	**129**	**.**	**211**
Notropis maculatus	.	.	.	2	.	.	2
Ogcocephalus cubifrons	1	6	8	.	449	28	492
Oligoplites saurus	6	22	57	46	26	.	157

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=19	E=126	E=107	E=168	E=192	E=40	E=652
Opisthonema oglinum	.	3	.	.	13	2	18
Opsanus beta	.	3	.	.	6	6	15
Orthopristis chrysoptera	59	27	89	16	133	700	1,024
Parablennius marmoreus	2	.	.	.	.	.	2
Paralichthys albigutta	**3**	**28**	**14**	**10**	**121**	**9**	**185**
Paralichthys lethostigma	**.**	**.**	**.**	**4**	**.**	**.**	**4**
Peprilus paru	.	.	.	.	15	.	15
Poecilia latipinna	.	.	.	11	.	.	11
Pogonias cromis	**.**	**2**	**14**	**5**	**341**	**.**	**362**
Pomatomus saltatrix	**.**	**.**	**7**	**3**	**.**	**.**	**10**
Portunus spp.	1	31	16	1	.	27	76
Prionotus martis	.	.	1	.	.	1	2
Prionotus scitulus	2	37	10	1	.	68	118
Prionotus tribulus	1	16	20	5	49	14	105
Rachycentron canadum	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Rhinoptera bonasus	.	.	.	.	79	1	80
Rostroraja texana	.	.	.	.	.	2	2
Sciaenops ocellatus	**.**	**8**	**94**	**38**	**346**	**.**	**486**
Selene vomer	.	.	.	.	15	.	15
Sicyonia typica	.	1	.	.	.	.	1
Sphoeroides nephelus	12	20	52	12	11	4	111
Sphoeroides spengleri	.	1	.	.	.	.	1
Sphyraena barracuda	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Sphyrna tiburo	**.**	**.**	**.**	**.**	**11**	**.**	**11**
Stephanolepis hispida	5	3	13	.	.	4	25
Strongylura marina	.	1	5	7	15	.	28
Strongylura notata	.	.	3	3	4	.	10
Strongylura spp.	.	.	4	9	.	.	13

Species	Gear and Strata						Totals
	21.3-m bay seine			21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	Veg	Unveg	Shore				
	E=19	E=126	E=107	E=168	E=192	E=40	E=652
Strongylura timucu	.	1	1	.	6	.	8
Symphurus plagiusa	.	46	41	6	.	65	158
Syngnathus floridae	25	.	.	.	.	1	26
Syngnathus louisianae	.	.	1	1	.	3	5
Syngnathus scovelli	19	7	3	11	.	3	43
Synodus foetens	2	17	29	3	2	11	64
Trachinotus carolinus	**.**	**.**	**1**	**.**	**1**	**.**	**2**
Trachinotus falcatus	**.**	**.**	**24**	**.**	**67**	**.**	**91**
Trinectes maculatus	.	1	.	119	1	8	129
Urophycis floridana	.	.	.	.	.	1	1
Totals	**899**	**8,819**	**16,530**	**26,364**	**13,722**	**6,923**	**73,257**

Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or offshore) within 5-m. Sampling with 21.3-m river seine, 183-m haul seine, and 6.1-m otter trawl was not stratified. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.12: Summary by zone of taxa collected during Cedar Key stratified-random sampling, 2023.

Species	Zone			Totals
	B	C	F	
	E=344	E=248	E=60	E=652
Acanthostracion quadricornis	1	1	.	2
Achirus lineatus	15	1	79	95
Alburnops petersoni	.	.	63	63
Alburnops spp.	.	.	3	3
Alosa alabamae	1	.	.	1
Aluterus schoepfii	.	2	.	2
Ameiurus catus	4	.	.	4
Anchoa cubana	1	.	.	1
Anchoa hepsetus	46	287	.	333
Anchoa mitchilli	19,241	6,797	3,898	29,936
Ancylopsetta quadrocellata	.	8	.	8
Archosargus probatocephalus	**28**	**42**	**.**	**70**
Argopecten irradians	**.**	**2**	**.**	**2**
Ariopsis felis	611	1,096	.	1,707
Astroscopus y-graecum	1	1	.	2
Bagre marinus	69	99	.	168
Bairdiella chrysoura	1,014	766	901	2,681
Bathygobius soporator	12	.	1	13
***Brevoortia* spp.**	**2,322**	**107**	**.**	**2,429**
Calamus arctifrons	**.**	**1**	**.**	**1**
Callinectes sapidus	**335**	**67**	**222**	**624**
Callinectes similis	.	1	.	1
Callinectes sp.	.	1	.	1
Caranx hippos	**.**	**9**	**.**	**9**
Caranx latus	1	2	.	3
Carcharhinus leucas	**3**	**.**	**.**	**3**
Carcharhinus limbatus	**.**	**1**	**.**	**1**

Species	Zone			Totals
	B	C	F	
	E=344	E=248	E=60	E=652
Centropomus undecimalis	**181**	**104**	**.**	**285**
Centropristis striata	**1**	**11**	**.**	**12**
Chaetodipterus faber	66	91	.	157
Chasmodes saburrae	.	4	.	4
Chilomycterus schoepfii	4	25	.	29
Chloroscombrus chrysurus	5	16	.	21
Citharichthys macrops	3	16	.	19
Ctenogobius boleosoma	3	.	2	5
Ctenogobius smaragdus	6	1	.	7
Cynoscion arenarius	**956**	**106**	**20**	**1,082**
Cynoscion nebulosus	**94**	**51**	**3**	**148**
Cyprinodon variegatus	28	6	.	34
Decapterus punctatus	1	.	.	1
Diplectrum formosum	**1**	**5**	**.**	**6**
Diplodus holbrookii	.	1	.	1
Dorosoma cepedianum	39	19	.	58
Dorosoma petenense	8	2	.	10
Echeneis neucratoides	2	8	.	10
Elops saurus	**173**	**93**	**.**	**266**
Etropus crossotus	187	324	.	511
Eucinostomus gula	191	284	11	486
Eucinostomus harengulus	330	215	98	643
Eucinostomus spp.	1,012	337	393	1,742
Farfantepenaeus duorarum	**29**	**31**	**.**	**60**
***Farfantepenaeus* spp.**	**250**	**106**	**4**	**360**
Floridichthys carpio	.	10	.	10
Fundulus confluentus	2	.	95	97
Fundulus grandis	148	53	18	219
Fundulus seminolis	5	.	355	360

Species	Zone			Totals
	B	C	F	
	E=344	**E=248**	**E=60**	**E=652**
Fundulus similis	119	102	.	221
Fundulus xenicus	33	.	.	33
Gambusia holbrooki	20	.	907	927
Gobiesox strumosus	3	1	.	4
Gobiosoma bosc	14	2	50	66
Gobiosoma robustum	3	4	1	8
Gobiosoma spp.	8	1	37	46
Gymnura lessae	.	46	.	46
Haemulon plumierii	**.**	**3**	**.**	**3**
Harengula jaguana	529	899	3	1,431
Hemicaranx amblyrhynchus	1	.	.	1
Heterandria formosa	.	.	10	10
Hippocampus erectus	1	2	.	3
Hippocampus zosterae	.	2	.	2
Hypanus americanus	3	27	.	30
Hypanus sabinus	613	1,087	.	1,700
Hypanus say	89	391	.	480
Hyporhamphus meeki	.	1	.	1
Hyporhamphus spp.	.	10	.	10
Hypsoblennius hentz	1	.	.	1
Labidesthes vanhyningi	.	.	22	22
Lagocephalus laevigatus	1	.	.	1
Lagodon rhomboides	2,063	3,512	379	5,954
Leiostomus xanthurus	**3,210**	**1,209**	**139**	**4,558**
Lepisosteus osseus	19	3	1	23
Lepisosteus platyrhincus	1	.	1	2
Lepomis auritus	.	.	1	1
Lepomis macrochirus	.	.	10	10
Lepomis microlophus	.	.	5	5

Species	Zone			Totals
	B	C	F	
	E=344	E=248	E=60	E=652
Lepomis punctatus	.	.	28	28
Lepomis spp.	.	.	7	7
Limulus polyphemus	13	9	.	22
Litopenaeus setiferus	**129**	**21**	**6**	**156**
Lobotes surinamensis	**1**	**6**	**.**	**7**
Lucania goodei	.	.	65	65
Lucania parva	6	.	306	312
Lutjanus griseus	**37**	**6**	**2**	**45**
Lutjanus synagris	**3**	**13**	**.**	**16**
Membras martinica	321	222	4	547
Menidia spp.	2,226	1,821	297	4,344
***Menippe* spp.**	**3**	**12**	**.**	**15**
Menticirrhus americanus	**409**	**313**	**.**	**722**
Menticirrhus saxatilis	**12**	**15**	**.**	**27**
Microgobius gulosus	12	4	10	26
Microgobius thalassinus	7	9	.	16
Micropogonias undulatus	**82**	**80**	**.**	**162**
Micropterus salmoides	1	.	25	26
Monacanthus ciliatus	.	1	.	1
Mugil cephalus	**1,450**	**595**	**1**	**2,046**
Mugil curema	**31**	**110**	**.**	**141**
Mugil trichodon	**53**	**158**	**.**	**211**
Notropis maculatus	.	.	2	2
Ogcocephalus cubifrons	32	460	.	492
Oligoplites saurus	88	62	7	157
Opisthonema oglinum	7	11	.	18
Opsanus beta	2	13	.	15
Orthopristis chrysoptera	67	957	.	1,024
Parablennius marmoreus	.	2	.	2

Species	Zone			Totals
	B	C	F	
	E=344	E=248	E=60	E=652
Paralichthys albigutta	**80**	**101**	**4**	**185**
Paralichthys lethostigma	**.**	**.**	**4**	**4**
Peprilus paru	5	10	.	15
Poecilia latipinna	6	.	5	11
Pogonias cromis	**222**	**140**	**.**	**362**
Pomatomus saltatrix	**10**	**.**	**.**	**10**
Portunus spp.	10	66	.	76
Prionotus martis	1	1	.	2
Prionotus scitulus	49	69	.	118
Prionotus tribulus	47	58	.	105
Rachycentron canadum	**.**	**1**	**.**	**1**
Rhinoptera bonasus	18	62	.	80
Rostroraja texana	2	.	.	2
Sciaenops ocellatus	**299**	**169**	**18**	**486**
Selene vomer	1	14	.	15
Sicyonia typica	.	1	.	1
Sphoeroides nephelus	52	59	.	111
Sphoeroides spengleri	.	1	.	1
Sphyraena barracuda	**.**	**1**	**.**	**1**
Sphyrna tiburo	**1**	**10**	**.**	**11**
Stephanolepis hispida	1	24	.	25
Strongylura marina	19	8	1	28
Strongylura notata	4	6	.	10
Strongylura spp.	8	2	3	13
Strongylura timucu	2	6	.	8
Symphurus plagiusa	113	44	1	158
Syngnathus floridae	.	26	.	26
Syngnathus louisianae	2	3	.	5
Syngnathus scovelli	6	28	9	43

Species	Zone			Totals
	B	C	F	
	E=344	E=248	E=60	E=652
Synodus foetens	20	44	.	64
Trachinotus carolinus	**1**	**1**	**.**	**2**
Trachinotus falcatus	**43**	**48**	**.**	**91**
Trinectes maculatus	6	6	117	129
Urophycis floridana	1	.	.	1
Totals	**40,182**	**24,421**	**8,654**	**73,257**

Zone B encompassed the northern portion of the universe and included all tidal creeks; Zone C encompassed the southern portion of the universe; Zone F encompassed the lower Suwanee River. Effort, or the total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

A.5 Tampa Bay

Table A.13: Monthly summary of taxa collected during Tampa Bay stratified-random sampling, 2023.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=119	E=90	E=68	E=105	E=68	E=90	E=83	E=90	E=104	E=105	E=104	E=90	E=1,116
Acanthostracion quadricornis	24	6	8	11	20	27	5	4	6	18	3	48	180
Achirus lineatus	23	12	10	17	5	16	43	38	40	27	21	10	262
Alburnops petersoni	.	.	.	.	.	21	.	.	25	.	.	1	47
Aluterus schoepfii	.	.	.	2	.	10	3	1	.	1	.	.	17
Anchoa cubana	.	.	.	.	.	.	2	644	.	.	.	1	647
Anchoa hepsetus	.	.	.	3	1	3	1	11	3	1	.	.	23
Anchoa mitchilli	11,547	8,775	941	29,669	175	8,550	15,907	76,209	19,331	16,994	61,402	12,712	262,212
Archosargus probatocephalus	**93**	**67**	**33**	**41**	**54**	**52**	**14**	**44**	**40**	**51**	**32**	**43**	**564**
Argopecten gibbus	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**
Argopecten irradians	**.**	**.**	**.**	**4**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**5**
Ariopsis felis	54	47	52	311	124	149	126	184	187	150	96	22	1,502
Atherina harringtonensis	.	1	.	.	.	.	.	.	.	.	.	.	1
Atherinopsidae sp.	.	.	.	.	.	1	.	.	.	.	.	.	1
Bagre marinus	.	1	.	.	1	1	1	.	.	3	.	.	7
Bairdiella chrysoura	6	87	5	258	25	736	282	2,743	182	91	75	30	4,520
Bathygobius soporator	68	14	1	8	1	.	.	2	2	1	6	11	114

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=119	E=90	E=68	E=105	E=68	E=90	E=83	E=90	E=104	E=105	E=104	E=90	E=1,116
Belonesox belizanus	16	4	.	1	.	.	.	.	1	.	.	1	23
***Brevoortia* spp.**	**.**	**5**	**79**	**4**	**.**	**6**	**.**	**.**	**.**	**.**	**12**	**.**	**106**
Calamus penna	**.**	**1**	**.**	**.**	**2**	**3**	**3**	**.**	**4**	**.**	**1**	**2**	**16**
***Calamus* spp.**	**1**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**4**
Callinectes ornatus	.	1	5	1	5	1	.	.	3	.	1	.	17
Callinectes sapidus	**56**	**49**	**139**	**46**	**43**	**12**	**39**	**10**	**21**	**16**	**33**	**43**	**507**
Callinectes spp.	.	.	1	.	.	.	.	.	.	.	1	.	2
Caranx hippos	**5**	**.**	**.**	**.**	**.**	**1**	**.**	**6**	**.**	**1**	**.**	**1**	**14**
Caranx latus	.	.	.	.	.	.	.	.	1	1	10	1	13
Carcharhinus leucas	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**1**
Carcharhinus sp.	.	.	.	.	.	.	.	.	1	.	.	.	1
Centropomus undecimalis	**117**	**74**	**23**	**114**	**118**	**77**	**173**	**62**	**70**	**109**	**45**	**159**	**1,141**
Chaetodipterus faber	1	.	.	22	13	23	49	96	33	40	3	3	283
Chasmodes saburrae	15	2	2	.	4	8	22	14	1	5	6	4	83
Chilomycterus schoepfii	37	10	8	14	20	21	65	10	27	57	17	24	310
Chloroscombrus chrysurus	.	.	.	.	.	.	7	.	4	3	3	.	17
Citharichthys macrops	.	.	.	.	.	.	.	.	.	1	.	.	1
Clarias batrachus	.	.	.	.	.	1	.	.	.	.	.	.	1
Ctenogobius smaragdus	1	.	.	.	.	.	.	.	.	.	.	.	1
Cynoscion arenarius	**.**	**.**	**.**	**10**	**2**	**9**	**195**	**1**	**14**	**9**	**2**	**4**	**246**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=119	E=90	E=68	E=105	E=68	E=90	E=83	E=90	E=104	E=105	E=104	E=90	E=1,116
Cynoscion nebulosus	**100**	**14**	**1**	**8**	**5**	**87**	**119**	**131**	**176**	**96**	**32**	**20**	**789**
Cyprinodon variegatus	7	173	2	9	13	4	.	1	19	2	5	19	254
Dactyloscopus moorei	3	.	.	.	.	.	2	.	.	.	.	1	6
Diapterus auratus	7	16	.	1	.	2	29	6	10	20	2	.	93
Diodon holocanthus	.	1	.	.	.	.	.	.	.	.	.	.	1
Diplectrum formosum	**1**	**.**	**.**	**3**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**5**
Diplodus holbrookii	.	.	.	4	7	20	10	5	9	.	2	2	59
Dorosoma cepedianum	.	.	.	.	.	1	.	.	.	.	.	.	1
Dorosoma petenense	.	.	.	.	.	1	.	.	.	.	.	.	1
Echeneis neucratoides	.	.	.	.	.	.	.	.	.	.	.	1	1
Elops saurus	**781**	**589**	**19**	**24**	**27**	**34**	**11**	**21**	**21**	**19**	**21**	**48**	**1,615**
Epinephelus morio	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Eucinostomus argenteus	.	.	.	.	.	.	.	.	.	1	.	.	1
Eucinostomus gula	932	788	1,147	891	392	692	858	1,435	1,596	3,104	3,074	2,887	17,796
Eucinostomus harengulus	560	925	80	984	414	604	948	729	901	702	1,075	1,115	9,037
Eucinostomus spp.	3,889	2,875	374	679	586	2,574	5,674	2,674	2,796	4,301	7,110	6,737	40,269
Eugerres plumieri	216	37	.	68	2	446	11	294	148	121	92	117	1,552
Farfantepenaeus duorarum	**113**	**31**	**35**	**36**	**24**	**90**	**511**	**125**	**722**	**242**	**281**	**100**	**2,310**
Floridichthys carpio	225	27	815	20	204	282	19	217	84	2,242	185	328	4,648
Fundulus confluentus	.	1	.	.	.	.	.	.	.	.	.	.	1

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=119	**E=90**	**E=68**	**E=105**	**E=68**	**E=90**	**E=83**	**E=90**	**E=104**	**E=105**	**E=104**	**E=90**	**E=1,116**
Fundulus grandis	51	42	18	180	77	12	.	16	3	17	62	19	497
Fundulus seminolis	3	.	.	.	.	1	.	11	.	.	.	1	16
Fundulus similis	249	9	45	1	15	52	.	80	.	8	.	.	459
Fundulus xenicus	.	.	.	.	2	.	.	.	.	.	.	.	2
Gambusia holbrooki	47	14	.	.	.	2	.	12	.	.	3	3	81
Gerres cinereus	.	.	.	.	11	.	.	.	.	.	.	.	11
Gobiesox strumosus	1	.	.	.	1	.	.	.	.	.	.	.	2
Gobiosoma bosc	125	33	5	30	1	5	.	18	85	23	9	63	397
Gobiosoma longipala	6	1	.	.	.	.	.	.	.	1	.	.	8
Gobiosoma robustum	92	23	131	59	57	18	45	41	17	9	12	19	523
Gobiosoma spp.	27	6	8	6	7	16	142	24	112	35	74	11	468
Gymnura lessae	.	.	.	.	.	.	.	.	.	.	2	.	2
Haemulon aurolineatum	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**5**	**.**	**.**	**5**
Haemulon plumierii	**.**	**7**	**.**	**.**	**1**	**.**	**10**	**1**	**.**	**48**	**7**	**13**	**87**
Harengula jaguana	2	134	187	3	33	25	1,463	805	861	308	89	18	3,928
Hemichromis letourneuxi	.	.	.	.	.	.	.	1	.	.	.	1	2
Hippocampus erectus	8	.	1	5	.	2	5	.	.	2	1	.	24
Hippocampus zosterae	3	8	5	3	.	10	13	7	13	1	5	11	79
Hypanus americanus	.	1	.	.	1	1	.	.	2	.	.	.	5
Hypanus sabinus	33	39	41	32	24	43	64	19	40	59	31	29	454

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=119	E=90	E=68	E=105	E=68	E=90	E=83	E=90	E=104	E=105	E=104	E=90	E=1,116
Hypanus say	.	.	1	2	2	1	3	4	13	2	.	.	28
Hyporhamphus meeki	.	1	.	.	.	.	.	.	.	.	.	.	1
Hyporhamphus spp.	.	.	.	1	3	.	2	.	.	1	.	.	7
Hypsoblennius hentz	.	.	.	.	.	.	.	1	.	.	.	.	1
Labidesthes vanhyningi	.	.	.	1	.	.	.	.	.	.	.	.	1
Lagodon rhomboides	276	1,521	3,735	4,651	2,895	2,795	4,350	4,424	4,364	7,404	4,234	1,183	41,832
Leiostomus xanthurus	**.**	**65**	**7**	**34**	**47**	**29**	**24**	**21**	**69**	**.**	**.**	**.**	**296**
Lepisosteus osseus	1	.	.	.	.	.	.	.	.	.	2	.	3
Lepomis macrochirus	1	3	.	1	.	1	.	.	35	.	1	.	42
Lepomis punctatus	.	.	.	2	.	.	.	.	1	.	.	.	3
Lepomis spp.	.	.	.	.	.	1	.	.	17	.	.	.	18
Limulus polyphemus	9	.	4	3	.	1	1	.	.	3	1	.	22
Lobotes surinamensis	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**.**	**2**
Lophogobius cyprinoides	56	5	6	30	6	1	12	26	45	19	18	19	243
Lucania parva	570	520	376	126	1,363	648	854	1,242	2,456	196	1,515	1,036	10,902
Lupinoblennius nicholsi	2	.	.	.	.	.	.	.	.	.	.	.	2
Lutjanus griseus	**.**	**.**	**3**	**1**	**2**	**19**	**23**	**13**	**10**	**3**	**1**	**2**	**77**
Lutjanus synagris	**8**	**.**	**.**	**.**	**.**	**.**	**5**	**.**	**3**	**141**	**1**	**.**	**158**
Mayaheros urophthalmus	.	1	.	.	.	1	.	.	.	1	33	24	60
Membras martinica	1	2	2	.	3	4	.	503	1	46	.	.	562

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=119	E=90	E=68	E=105	E=68	E=90	E=83	E=90	E=104	E=105	E=104	E=90	E=1,116
Menidia spp.	1,807	1,037	573	3,659	589	2,896	1,257	1,837	1,960	1,426	3,102	1,941	22,084
***Menippe* spp.**	**14**	**.**	**1**	**4**	**.**	**.**	**5**	**.**	**.**	**2**	**.**	**.**	**26**
Menticirrhus americanus	**3**	**.**	**16**	**12**	**14**	**4**	**102**	**3**	**117**	**15**	**6**	**.**	**292**
Menticirrhus littoralis	**.**	**.**	**.**	**.**	**12**	**9**	**1**	**.**	**.**	**.**	**.**	**.**	**22**
Menticirrhus saxatilis	**3**	**4**	**.**	**2**	**6**	**.**	**3**	**.**	**.**	**.**	**1**	**3**	**22**
Microgobius gulosus	379	227	135	241	624	1,140	585	321	481	328	407	180	5,048
Microgobius thalassinus	3	.	1	2	1	.	18	.	1	.	1	.	27
Micropterus salmoides	.	.	.	12	.	5	.	.	.	.	.	.	17
Monacanthus ciliatus	.	2	.	.	.	.	.	.	.	4	.	.	6
Mugil cephalus	**52**	**105**	**18**	**42**	**21**	**23**	**3**	**9**	**4**	**20**	**6**	**76**	**379**
Mugil curema	**20**	**1**	**15**	**6**	**25**	**24**	**6**	**4**	**1**	**4**	**3**	**5**	**114**
Mugil sp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Mugil trichodon	**79**	**84**	**13**	**23**	**18**	**15**	**35**	**9**	**6**	**25**	**76**	**257**	**640**
Mycteroperca microlepis	**.**	**.**	**.**	**.**	**.**	**2**	**17**	**11**	**6**	**6**	**4**	**1**	**47**
Nicholsina usta	.	1	.	.	.	.	1	.	.	7	.	1	10
Notropis maculatus	.	.	.	.	.	.	.	.	.	57	.	.	57
Oligoplites saurus	6	6	.	12	6	36	57	57	74	76	48	13	391
Ophidion holbrookii	.	1	.	.	.	.	.	.	.	.	.	.	1
Opisthonema oglinum	.	13	530	24	5	60	302	179	32	158	97	1	1,401
Opsanus beta	17	6	1	28	7	18	29	9	11	4	7	7	144

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=119	E=90	E=68	E=105	E=68	E=90	E=83	E=90	E=104	E=105	E=104	E=90	E=1,116
Oreochromis niloticus	2	.	.	.	.	.	.	.	.	.	.	.	2
Sarotherodon spp.	3	.	.	5	.	94	1	1	2	1	.	.	107
Orthopristis chrysoptera	6	206	343	93	71	134	137	12	45	9	12	2	1,070
Paraclinus marmoratus	.	.	.	.	.	1	.	.	.	.	.	.	1
Paralichthys albigutta	**7**	**7**	**6**	**14**	**4**	**10**	**10**	**3**	**11**	**7**	**3**	**1**	**83**
Poecilia latipinna	89	57	.	31	6	.	.	.	7	.	3	207	400
Pogonias cromis	**3**	**.**	**.**	**.**	**1**	**1**	**1**	**.**	**4**	**4**	**3**	**.**	**17**
Pomatomus saltatrix	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**1**
Portunus spp.	39	10	2	154	.	3	423	.	3	8	4	4	650
Prionotus scitulus	63	13	16	90	3	9	172	3	6	50	25	10	460
Prionotus tribulus	26	4	4	3	.	.	1	.	.	6	7	1	52
Pseudobatos lentiginosus	.	.	.	.	.	.	1	.	.	.	.	.	1
Pterygoplichthys disjunctivus	1	.	.	.	.	.	.	.	.	.	.	.	1
Rachycentron canadum	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**2**
Rhinoptera bonasus	.	26	13	25	4	1	.	5	25	.	2	.	101
Rimapenaeus sp.	.	.	.	.	.	.	.	.	.	.	1	.	1
Sarotherodon melanotheron	16	.	.	.	.	.	.	1	5	1	2	7	32
Sciaenops ocellatus	**155**	**46**	**7**	**18**	**4**	**21**	**3**	**7**	**15**	**20**	**75**	**48**	**419**
Scorpaena brasiliensis	.	.	.	.	.	.	1	.	.	.	.	.	1
Selene vomer	.	.	.	.	9	3	2	.	.	2	1	.	17

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=119	E=90	E=68	E=105	E=68	E=90	E=83	E=90	E=104	E=105	E=104	E=90	E=1,116
Serraniculus pumilio	2	.	.	.	.	.	.	.	.	.	.	.	2
Sicyonia laevigata	.	1	.	2	.	.	.	.	.	.	.	.	3
Sicyonia typica	4	.	.	33	.	.	.	.	.	.	.	.	37
Sphoeroides nephelus	22	13	17	35	20	12	30	10	8	18	30	21	236
Sphoeroides spengleri	4	.	1	.	.	.	1	.	.	3	.	1	10
Sphyraena barracuda	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**4**	**2**	**5**	**3**	**14**
Sphyraena borealis	.	.	.	.	1	.	.	.	.	.	.	.	1
Sphyrna tiburo	**.**	**2**	**1**	**2**	**2**	**.**	**1**	**11**	**3**	**6**	**3**	**7**	**38**
Stephanolepis hispida	.	1	1	20	24	7	20	.	.	.	2	7	82
Strongylura marina	.	.	1	2	10	6	1	2	2	7	8	12	51
Strongylura notata	7	7	10	19	22	89	37	67	118	75	97	72	620
Strongylura spp.	.	1	2	5	.	.	.	.	.	.	.	1	9
Strongylura timucu	3	.	1	3	2	3	.	7	.	1	3	2	25
Symphurus plagiusa	20	2	3	8	2	.	24	2	5	48	6	1	121
Syngnathus floridae	3	5	1	4	8	1	18	9	2	6	4	12	73
Syngnathus louisianae	6	1	2	4	4	3	9	6	7	6	14	10	72
Syngnathus scovelli	49	19	61	85	38	64	77	70	55	11	21	40	590
Syngnathus sp.	.	.	1	.	.	.	.	.	.	.	.	.	1
Synodus foetens	38	25	9	38	25	26	25	4	15	21	12	11	249
Trachinotus carolinus	**1**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**4**	**6**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=119	E=90	E=68	E=105	E=68	E=90	E=83	E=90	E=104	E=105	E=104	E=90	E=1,116
Trachinotus falcatus	**.**	**.**	**16**	**.**	**.**	**.**	**8**	**11**	**6**	**7**	**1**	**1**	**50**
Trinectes maculatus	288	114	35	49	8	11	54	22	62	37	86	172	938
Tylosurus crocodilus	.	.	.	.	.	.	.	.	2	.	.	2	4
Urophycis floridana	1	.	.	.	.	.	.	.	.	.	.	.	1
Totals	**23,711**	**19,115**	**10,212**	**43,244**	**8,436**	**22,984**	**35,624**	**95,679**	**37,730**	**39,252**	**83,940**	**30,093**	**450,020**

Effort, or total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.14: Summary by gear and stratum of taxa collected during Tampa Bay stratified-random sampling, 2023.

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=120		E=168	E=171	E=153	E=185	E=55	E=144	E=1,116
Acanthostracion quadricornis	8	2	.	.	.	59	82	29	180
Achirus lineatus	18	12	80	40	37	17	2	56	262
Alburnops petersoni	.	.	.	35	12	.	.	.	47
Aluterus schoepfii	2	.	.	.	.	10	3	2	17
Anchoa cubana	1	.	646	.	.	.	.	.	647
Anchoa hepsetus	.	.	14	1	6	.	.	2	23
Anchoa mitchilli	1,436	1,001	71,858	67,652	115,785	.	.	4,480	262,212
Archosargus probatocephalus	**13**	**1**	**21**	**16**	**32**	**365**	**105**	**11**	**564**
Argopecten gibbus	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**1**
Argopecten irradians	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**4**	**5**
Ariopsis felis	46	66	13	6	5	1,096	183	87	1,502
Atherina harringtonensis	.	1	.	.	.	.	.	.	1
Atherinopsidae sp.	.	.	.	1	.	.	.	.	1
Bagre marinus	.	.	.	.	.	5	.	2	7
Bairdiella chrysoura	364	66	1,343	32	2,312	169	105	129	4,520
Bathygobius soporator	.	.	3	41	67	.	.	3	114
Belonesox belizanus	.	.	.	20	3	.	.	.	23
***Brevoortia* spp.**	**.**	**.**	**.**	**1**	**7**	**97**	**1**	**.**	**106**
Calamus penna	**3**	**.**	**.**	**.**	**.**	**10**	**3**	**.**	**16**
***Calamus* spp.**	**2**	**.**	**2**	**.**	**.**	**.**	**.**	**.**	**4**
Callinectes ornatus	.	6	2	.	.	4	3	2	17
Callinectes sapidus	**12**	**10**	**32**	**32**	**41**	**122**	**45**	**213**	**507**
Callinectes spp.	.	.	1	.	.	.	.	1	2
Caranx hippos	**.**	**.**	**.**	**.**	**.**	**14**	**.**	**.**	**14**
Caranx latus	.	.	.	1	1	4	7	.	13
Carcharhinus leucas	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**1**

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=120		E=168	E=171	E=153	E=185	E=55	E=144	E=1,116
Carcharhinus sp.	.	.	.	.	.	1	.	.	1
Centropomus undecimalis	**.**	**.**	**4**	**56**	**52**	**862**	**167**	**.**	**1,141**
Chaetodipterus faber	11	6	11	.	.	172	46	37	283
Chasmodes saburrae	19	1	55	3	1	2	1	1	83
Chilomycterus schoepfii	27	9	20	1	1	127	27	98	310
Chloroscombrus chrysurus	3	.	.	.	.	1	4	9	17
Citharichthys macrops	.	.	.	.	.	.	.	1	1
Clarias batrachus	.	.	.	1	.	.	.	.	1
Ctenogobius smaragdus	.	.	.	.	1	.	.	.	1
Cynoscion arenarius	**4**	**.**	**5**	**10**	**18**	**.**	**.**	**209**	**246**
Cynoscion nebulosus	**152**	**11**	**309**	**50**	**42**	**191**	**8**	**26**	**789**
Cyprinodon variegatus	.	.	170	27	57	.	.	.	254
Dactyloscopus moorei	2	3	1	.	.	.	.	.	6
Diapterus auratus	.	.	.	22	11	60	.	.	93
Diodon holocanthus	.	.	.	.	.	.	1	.	1
Diplectrum formosum	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**5**	**5**
Diplodus holbrookii	4	.	.	.	.	50	2	3	59
Dorosoma cepedianum	.	.	.	.	.	1	.	.	1
Dorosoma petenense	.	.	.	1	.	.	.	.	1
Echeneis neucratoides	1	.	.	.	.	.	.	.	1
Elops saurus	**1**	**1**	**.**	**3**	**30**	**1,455**	**124**	**1**	**1,615**
Epinephelus morio	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**1**
Eucinostomus argenteus	.	.	1	.	.	.	.	.	1
Eucinostomus gula	1,497	605	4,620	1,777	710	6,639	1,154	794	17,796
Eucinostomus harengulus	136	460	1,437	2,921	2,107	1,509	241	226	9,037
Eucinostomus spp.	5,804	2,218	13,494	10,276	7,402	8	1	1,066	40,269
Eugerres plumieri	1	17	80	573	792	66	15	8	1,552
Farfantepenaeus duorarum	**596**	**37**	**866**	**199**	**108**	**54**	**14**	**436**	**2,310**

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=120		E=168	E=171	E=153	E=185	E=55	E=144	E=1,116
Floridichthys carpio	32	6	4,539	40	19	12	.	.	4,648
Fundulus confluentus	.	.	.	1	.	.	.	.	1
Fundulus grandis	.	.	215	190	91	1	.	.	497
Fundulus seminolis	.	.	.	14	2	.	.	.	16
Fundulus similis	.	.	144	2	312	1	.	.	459
Fundulus xenicus	.	.	2	.	.	.	.	.	2
Gambusia holbrooki	.	.	.	63	18	.	.	.	81
Gerres cinereus	.	.	.	.	.	4	7	.	11
Gobiesox strumosus	.	.	.	1	.	.	.	1	2
Gobiosoma bosc	.	2	4	225	161	.	.	5	397
Gobiosoma longipala	.	.	1	.	.	.	.	7	8
Gobiosoma robustum	246	29	189	15	9	.	.	35	523
Gobiosoma spp.	102	20	72	107	36	.	.	131	468
Gymnura lessae	.	.	.	.	.	2	.	.	2
Haemulon aurolineatum	**.**	**.**	**.**	**.**	**.**	**.**	**5**	**.**	**5**
Haemulon plumierii	**1**	**.**	**1**	**.**	**.**	**25**	**32**	**28**	**87**
Harengula jaguana	861	48	2,198	42	214	334	203	28	3,928
Hemichromis letourneuxi	.	.	.	2	.	.	.	.	2
Hippocampus erectus	2	2	1	.	.	2	1	16	24
Hippocampus zosterae	52	6	18	3	.	.	.	.	79
Hypanus americanus	.	.	.	.	.	2	3	.	5
Hypanus sabinus	4	7	7	2	1	299	62	72	454
Hypanus say	2	.	1	.	.	14	8	3	28
Hyporhamphus meeki	.	.	.	.	.	.	1	.	1
Hyporhamphus spp.	1	4	2	.	.	.	.	.	7
Hypsoblennius hentz	.	.	1	.	.	.	.	.	1
Labidesthes vanhyningi	.	.	.	.	1	.	.	.	1
Lagodon rhomboides	6,771	326	2,994	478	444	25,127	4,715	977	41,832

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=120		E=168	E=171	E=153	E=185	E=55	E=144	E=1,116
Leiostomus xanthurus	**.**	**.**	**60**	**24**	**17**	**163**	**23**	**9**	**296**
Lepisosteus osseus	.	.	.	.	.	1	.	2	3
Lepomis macrochirus	.	.	.	33	9	.	.	.	42
Lepomis punctatus	.	.	.	3	.	.	.	.	3
Lepomis spp.	.	.	.	5	13	.	.	.	18
Limulus polyphemus	3	2	1	.	.	8	.	8	22
Lobotes surinamensis	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**.**	**2**
Lophogobius cyprinoides	1	1	4	95	106	.	.	36	243
Lucania parva	2,053	193	6,471	1,549	629	.	.	7	10,902
Lupinoblennius nicholsi	.	.	.	2	.	.	.	.	2
Lutjanus griseus	**2**	**.**	**7**	**.**	**6**	**53**	**8**	**1**	**77**
Lutjanus synagris	**.**	**.**	**.**	**.**	**.**	**4**	**17**	**137**	**158**
Mayaheros urophthalmus	.	.	.	30	29	1	.	.	60
Membras martinica	4	51	504	3	.	.	.	.	562
Menidia spp.	412	24	4,517	8,831	8,297	.	.	3	22,084
***Menippe* spp.**	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**24**	**26**
Menticirrhus americanus	**36**	**.**	**159**	**.**	**3**	**2**	**1**	**91**	**292**
Menticirrhus littoralis	**.**	**.**	**.**	**.**	**.**	**10**	**12**	**.**	**22**
Menticirrhus saxatilis	**.**	**1**	**16**	**1**	**.**	**2**	**.**	**2**	**22**
Microgobius gulosus	1,413	631	1,193	979	424	.	.	408	5,048
Microgobius thalassinus	.	.	.	1	.	.	.	26	27
Micropterus salmoides	.	.	.	12	5	.	.	.	17
Monacanthus ciliatus	.	.	.	.	.	.	5	1	6
Mugil cephalus	**.**	**1**	**83**	**11**	**29**	**209**	**46**	**.**	**379**
Mugil curema	**.**	**.**	**3**	**1**	**2**	**101**	**7**	**.**	**114**
Mugil sp.	.	.	.	.	.	1	.	.	1
Mugil trichodon	**.**	**.**	**138**	**39**	**116**	**307**	**40**	**.**	**640**
Mycteroperca microlepis	**2**	**.**	**.**	**.**	**.**	**31**	**8**	**6**	**47**

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=120		E=168	E=171	E=153	E=185	E=55	E=144	E=1,116
Nicholsina usta	.	.	.	.	.	1	7	2	10
Notropis maculatus	.	.	.	.	57	.	.	.	57
Oligoplites saurus	28	23	135	65	53	71	15	1	391
Ophidion holbrookii	.	.	.	.	.	.	1	.	1
Opisthonema oglinum	86	5	408	15	38	723	114	12	1,401
Opsanus beta	7	1	9	4	5	76	12	30	144
Oreochromis niloticus	.	.	.	.	2	.	.	.	2
Sarotherodon spp.	.	.	1	10	96	.	.	.	107
Orthopristis chrysoptera	574	1	36	1	2	336	28	92	1,070
Paraclinus marmoratus	.	.	1	.	.	.	.	.	1
Paralichthys albigutta	**3**	**7**	**5**	**2**	**.**	**44**	**5**	**17**	**83**
Poecilia latipinna	.	.	8	206	186	.	.	.	400
Pogonias cromis	**.**	**.**	**1**	**.**	**.**	**8**	**3**	**5**	**17**
Pomatomus saltatrix	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**1**
Portunus spp.	1	10	3	.	.	9	8	619	650
Prionotus scitulus	7	30	9	3	2	41	9	359	460
Prionotus tribulus	2	2	10	3	.	7	.	28	52
Pseudobatos lentiginosus	.	.	.	.	.	.	.	1	1
Pterygoplichthys disjunctivus	.	.	.	1	.	.	.	.	1
Rachycentron canadum	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**1**	**2**
Rhinoptera bonasus	.	3	.	.	.	77	20	1	101
Rimapenaeus sp.	.	.	.	.	.	.	.	1	1
Sarotherodon melanotheron	1	.	.	7	17	6	1	.	32
Sciaenops ocellatus	**45**	**.**	**28**	**78**	**138**	**103**	**21**	**6**	**419**
Scorpaena brasiliensis	.	.	.	.	.	.	.	1	1
Selene vomer	.	.	.	.	.	6	11	.	17
Serraniculus pumilio	.	.	.	.	.	.	.	2	2
Sicyonia laevigata	.	.	1	.	.	.	.	2	3

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=120		E=168	E=171	E=153	E=185	E=55	E=144	E=1,116
Sicyonia typica	.	.	.	.	.	.	.	37	37
Sphoeroides nephelus	43	14	43	4	1	91	27	13	236
Sphoeroides spengleri	1	1	.	.	.	2	1	5	10
Sphyraena barracuda	**.**	**1**	**1**	**.**	**.**	**11**	**1**	**.**	**14**
Sphyraena borealis	1	.	.	.	.	.	.	.	1
Sphyrna tiburo	**.**	**1**	**.**	**.**	**.**	**31**	**6**	**.**	**38**
Stephanolepis hispida	37	1	9	.	.	21	1	13	82
Strongylura marina	2	2	14	8	4	3	18	.	51
Strongylura notata	14	46	199	120	82	131	28	.	620
Strongylura spp.	.	.	3	4	2	.	.	.	9
Strongylura timucu	1	1	7	6	10	.	.	.	25
Symphurus plagiusa	5	5	11	.	11	1	.	88	121
Syngnathus floridae	53	1	1	.	.	1	1	16	73
Syngnathus louisianae	20	6	24	2	2	1	.	17	72
Syngnathus scovelli	355	27	148	15	8	.	.	37	590
Syngnathus sp.	.	1	.	.	.	.	.	.	1
Synodus foetens	40	50	52	8	2	39	2	56	249
Trachinotus carolinus	**.**	**.**	**.**	**.**	**.**	**2**	**4**	**.**	**6**
Trachinotus falcatus	**.**	**3**	**22**	**.**	**.**	**21**	**4**	**.**	**50**
Trinectes maculatus	.	1	2	310	375	12	1	237	938
Tylosurus crocodilus	.	.	.	.	.	4	.	.	4
Urophycis floridana	.	.	1	.	.	.	.	.	1
Totals	**23,490**	**6,130**	**119,825**	**97,475**	**141,726**	**41,771**	**7,898**	**11,705**	**450,020**

Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or offshore) within 5-m. Offshore sets were further stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 21.3-m river seine and 183-m haul seine was stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Sampling with 6.1-m otter trawl was not stratified. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.15: Summary by zone of taxa collected during Tampa Bay stratified-random sampling, 2023.

Species	Zone									Totals
	A	B	C	D	E	K	L	M	N	
	E=144	E=132	E=172	E=104	E=156	E=129	E=117	E=96	E=66	E=1,116
Acanthostracion quadricornis	11	38	5	44	80	.	.	2	.	180
Achirus lineatus	62	33	44	6	19	40	34	17	7	262
Alburnops petersoni	.	.	.	.	.	47	.	.	.	47
Aluterus schoepfii	.	3	1	1	12	.	.	.	.	17
Anchoa cubana	.	.	646	1	.	.	.	.	.	647
Anchoa hepsetus	5	.	11	.	.	7	.	.	.	23
Anchoa mitchilli	25,865	15	47,617	134	739	38,573	76,058	52,900	20,311	262,212
Archosargus probatocephalus	**26**	**82**	**38**	**120**	**240**	**7**	**31**	**13**	**7**	**564**
Argopecten gibbus	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**1**
Argopecten irradians	**.**	**.**	**.**	**5**	**.**	**.**	**.**	**.**	**.**	**5**
Ariopsis felis	732	211	315	19	130	7	30	44	14	1,502
Atherina harringtonensis	.	.	.	.	1	.	.	.	.	1
Atherinopsidae sp.	.	.	.	.	.	.	.	1	.	1
Bagre marinus	2	.	3	.	1	.	.	.	1	7
Bairdiella chrysoura	195	199	1,251	288	184	2,077	19	51	256	4,520
Bathygobius soporator	.	.	3	.	.	73	20	15	3	114
Belonesox belizanus	.	.	.	.	.	23	.	.	.	23
***Brevoortia* spp.**	**12**	**.**	**7**	**79**	**.**	**3**	**2**	**1**	**2**	**106**
Calamus penna	**.**	**.**	**.**	**7**	**9**	**.**	**.**	**.**	**.**	**16**
***Calamus* spp.**	**.**	**.**	**.**	**1**	**3**	**.**	**.**	**.**	**.**	**4**
Callinectes ornatus	1	3	2	.	9	.	2	.	.	17
Callinectes sapidus	**105**	**13**	**59**	**46**	**43**	**52**	**86**	**86**	**17**	**507**
Callinectes spp.	.	1	.	.	.	.	1	.	.	2
Caranx hippos	**.**	**5**	**6**	**.**	**3**	**.**	**.**	**.**	**.**	**14**
Caranx latus	.	2	.	5	4	.	.	2	.	13
Carcharhinus leucas	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**1**
Carcharhinus sp.	.	.	1	.	.	.	.	.	.	1

Species	Zone									Totals
	A	B	C	D	E	K	L	M	N	
	E=144	E=132	E=172	E=104	E=156	E=129	E=117	E=96	E=66	E=1,116
Centropomus undecimalis	**74**	**169**	**29**	**332**	**429**	**50**	**14**	**14**	**30**	**1,141**
Chaetodipterus faber	61	132	59	4	11	1	10	5	.	283
Chasmodes saburrae	23	20	25	4	7	.	2	1	1	83
Chilomycterus schoepfii	37	99	39	37	72	.	6	20	.	310
Chloroscombrus chrysurus	2	2	12	.	1	.	.	.	.	17
Citharichthys macrops	.	.	.	.	1	.	.	.	.	1
Clarias batrachus	.	.	.	.	.	1	.	.	.	1
Ctenogobius smaragdus	.	.	.	.	.	1	.	.	.	1
Cynoscion arenarius	**50**	**.**	**149**	**.**	**.**	**44**	**1**	**1**	**1**	**246**
Cynoscion nebulosus	**210**	**97**	**197**	**61**	**111**	**38**	**26**	**38**	**11**	**789**
Cyprinodon variegatus	2	17	32	117	2	3	.	36	45	254
Dactyloscopus moorei	.	1	3	.	2	.	.	.	.	6
Diapterus auratus	1	5	4	29	21	9	7	16	1	93
Diodon holocanthus	.	.	.	.	1	.	.	.	.	1
Diplectrum formosum	**.**	**2**	**1**	**.**	**2**	**.**	**.**	**.**	**.**	**5**
Diplodus holbrookii	.	.	4	53	2	.	.	.	.	59
Dorosoma cepedianum	.	.	1	.	.	.	.	.	.	1
Dorosoma petenense	.	.	.	.	.	1	.	.	.	1
Echeneis neucratoides	.	.	.	.	1	.	.	.	.	1
Elops saurus	**32**	**105**	**1,390**	**40**	**14**	**28**	**2**	**.**	**4**	**1,615**
Epinephelus morio	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**1**
Eucinostomus argenteus	.	.	1	.	.	.	.	.	.	1
Eucinostomus gula	1,857	2,537	3,962	3,061	3,469	469	977	1,360	104	17,796
Eucinostomus harengulus	670	621	1,228	410	854	1,372	1,098	1,185	1,599	9,037
Eucinostomus spp.	1,410	3,213	4,295	5,968	6,737	7,687	5,233	2,718	3,008	40,269
Eugerres plumieri	99	31	20	.	29	398	301	181	493	1,552
Farfantepenaeus duorarum	**280**	**265**	**684**	**184**	**281**	**121**	**165**	**131**	**199**	**2,310**
Floridichthys carpio	996	132	226	349	2,886	51	6	1	1	4,648
Fundulus confluentus	.	.	.	.	.	.	.	.	1	1

Species	Zone									Totals
	A	B	C	D	E	K	L	M	N	
	E=144	E=132	E=172	E=104	E=156	E=129	E=117	E=96	E=66	E=1,116
Fundulus grandis	18	82	29	56	31	219	27	14	21	497
Fundulus seminolis	.	.	.	.	.	14	.	2	.	16
Fundulus similis	106	6	22	1	10	270	.	44	.	459
Fundulus xenicus	.	2	.	.	.	.	.	.	.	2
Gambusia holbrooki	.	.	.	.	.	1	.	.	80	81
Gerres cinereus	.	4	.	7	.	.	.	.	.	11
Gobiesox strumosus	.	.	.	.	.	1	.	1	.	2
Gobiosoma bosc	3	.	3	.	.	238	38	44	71	397
Gobiosoma longipala	.	.	2	5	1	.	.	.	.	8
Gobiosoma robustum	146	196	78	30	38	3	21	7	4	523
Gobiosoma spp.	45	26	115	2	13	24	200	24	19	468
Gymnura lessae	2	.	.	.	.	.	.	.	.	2
Haemulon aurolineatum	**.**	**.**	**.**	**5**	**.**	**.**	**.**	**.**	**.**	**5**
Haemulon plumierii	**.**	**1**	**1**	**61**	**24**	**.**	**.**	**.**	**.**	**87**
Harengula jaguana	695	154	1,650	991	179	45	176	38	.	3,928
Hemichromis letourneuxi	.	.	.	.	.	.	.	.	2	2
Hippocampus erectus	2	5	5	5	5	.	2	.	.	24
Hippocampus zosterae	13	13	29	15	6	.	3	.	.	79
Hypanus americanus	1	.	1	1	2	.	.	.	.	5
Hypanus sabinus	95	75	200	3	40	13	7	15	6	454
Hypanus say	3	6	12	4	2	1	.	.	.	28
Hyporhamphus meeki	.	.	.	1	.	.	.	.	.	1
Hyporhamphus spp.	2	2	2	.	1	.	.	.	.	7
Hypsoblennius hentz	.	1	.	.	.	.	.	.	.	1
Labidesthes vanhyningi	.	.	.	.	.	.	.	.	1	1
Lagodon rhomboides	754	3,742	2,553	18,853	14,841	609	153	257	70	41,832
Leiostomus xanthurus	**69**	**20**	**20**	**111**	**27**	**19**	**6**	**10**	**14**	**296**
Lepisosteus osseus	.	.	1	.	.	1	.	1	.	3
Lepomis macrochirus	.	.	.	.	.	40	.	.	2	42

Species	Zone									Totals
	A	B	C	D	E	K	L	M	N	
	E=144	E=132	E=172	E=104	E=156	E=129	E=117	E=96	E=66	E=1,116
Lepomis punctatus	.	.	.	.	.	3	.	.	.	3
Lepomis spp.	.	.	.	.	.	18	.	.	.	18
Limulus polyphemus	3	1	14	.	4	.	.	.	.	22
Lobotes surinamensis	**.**	**.**	**2**	**.**	**.**	**.**	**.**	**.**	**.**	**2**
Lophogobius cyprinoides	.	2	4	.	.	68	145	14	10	243
Lucania parva	830	1,075	760	4,905	1,150	506	137	301	1,238	10,902
Lupinoblennius nicholsi	.	.	.	.	.	2	.	.	.	2
Lutjanus griseus	**.**	**22**	**10**	**23**	**15**	**.**	**1**	**5**	**1**	**77**
Lutjanus synagris	**.**	**2**	**.**	**35**	**121**	**.**	**.**	**.**	**.**	**158**
Mayaheros urophthalmus	1	.	.	.	.	23	36	.	.	60
Membras martinica	558	.	.	.	1	.	1	2	.	562
Menidia spp.	1,884	749	941	749	633	7,082	2,871	1,809	5,366	22,084
***Menippe* spp.**	**1**	**6**	**6**	**9**	**4**	**.**	**.**	**.**	**.**	**26**
Menticirrhus americanus	**203**	**1**	**31**	**.**	**.**	**16**	**18**	**23**	**.**	**292**
Menticirrhus littoralis	**.**	**.**	**.**	**22**	**.**	**.**	**.**	**.**	**.**	**22**
Menticirrhus saxatilis	**.**	**2**	**3**	**5**	**10**	**1**	**1**	**.**	**.**	**22**
Microgobius gulosus	1,309	481	1,174	37	238	433	535	139	702	5,048
Microgobius thalassinus	3	.	17	.	.	3	.	4	.	27
Micropterus salmoides	.	.	.	.	.	16	1	.	.	17
Monacanthus ciliatus	.	.	.	5	1	.	.	.	.	6
Mugil cephalus	**75**	**39**	**116**	**77**	**32**	**30**	**.**	**1**	**9**	**379**
Mugil curema	**14**	**23**	**1**	**33**	**40**	**1**	**.**	**1**	**1**	**114**
Mugil sp.	.	.	.	.	1	.	.	.	.	1
Mugil trichodon	**40**	**28**	**31**	**54**	**332**	**35**	**.**	**16**	**104**	**640**
Mycteroperca microlepis	**.**	**.**	**.**	**37**	**10**	**.**	**.**	**.**	**.**	**47**
Nicholsina usta	.	.	.	9	1	.	.	.	.	10
Notropis maculatus	.	.	.	.	.	57	.	.	.	57
Oligoplites saurus	84	40	111	13	24	41	25	38	15	391
Ophidion holbrookii	.	.	.	1	.	.	.	.	.	1

Species	Zone									Totals
	A	B	C	D	E	K	L	M	N	
	E=144	E=132	E=172	E=104	E=156	E=129	E=117	E=96	E=66	E=1,116
Opisthonema oglinum	177	222	413	532	4	15	38	.	.	1,401
Opsanus beta	12	13	18	49	41	6	3	2	.	144
Oreochromis niloticus	.	.	.	.	.	2	.	.	.	2
Sarotherodon spp.	.	.	.	.	1	1	1	8	96	107
Orthopristis chrysoptera	3	94	59	575	335	1	.	2	1	1,070
Paraclinus marmoratus	.	.	.	.	1	.	.	.	.	1
Paralichthys albigutta	**6**	**16**	**22**	**7**	**27**	**4**	**1**	**.**	**.**	**83**
Poecilia latipinna	2	6	.	.	.	91	7	67	227	400
Pogonias cromis	**3**	**3**	**3**	**1**	**2**	**.**	**1**	**.**	**4**	**17**
Pomatomus saltatrix	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**
Portunus spp.	8	364	19	38	218	2	1	.	.	650
Prionotus scitulus	46	196	108	18	66	18	1	7	.	460
Prionotus tribulus	7	2	17	3	9	.	6	5	3	52
Pseudobatos lentiginosus	.	1	.	.	.	.	.	.	.	1
Pterygoplichthys disjunctivus	.	.	.	.	.	1	.	.	.	1
Rachycentron canadum	**1**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**2**
Rhinoptera bonasus	31	10	59	1	.	.	.	.	.	101
Rimapenaeus sp.	.	.	.	.	.	1	.	.	.	1
Sarotherodon melanotheron	4	.	2	1	1	16	1	1	6	32
Sciaenops ocellatus	**47**	**60**	**23**	**21**	**46**	**53**	**110**	**18**	**41**	**419**
Scorpaena brasiliensis	.	.	.	1	.	.	.	.	.	1
Selene vomer	.	.	5	6	6	.	.	.	.	17
Serraniculus pumilio	.	2	.	.	.	.	.	.	.	2
Sicyonia laevigata	.	2	.	1	.	.	.	.	.	3
Sicyonia typica	.	5	.	.	32	.	.	.	.	37
Sphoeroides nephelus	20	38	36	44	88	.	5	5	.	236
Sphoeroides spengleri	.	3	.	4	3	.	.	.	.	10
Sphyraena barracuda	**.**	**.**	**.**	**6**	**8**	**.**	**.**	**.**	**.**	**14**
Sphyraena borealis	.	1	.	.	.	.	.	.	.	1

Species	Zone									Totals
	A	B	C	D	E	K	L	M	N	
	E=144	E=132	E=172	E=104	E=156	E=129	E=117	E=96	E=66	E=1,116
Sphyrna tiburo	**17**	**6**	**10**	**3**	**2**	**.**	**.**	**.**	**.**	**38**
Stephanolepis hispida	.	1	6	60	15	.	.	.	.	82
Strongylura marina	6	11	6	3	13	9	2	1	.	51
Strongylura notata	91	85	123	43	76	17	54	100	31	620
Strongylura spp.	.	.	2	.	1	2	2	2	.	9
Strongylura timucu	.	6	.	1	2	10	3	1	2	25
Symphurus plagiusa	18	13	70	1	.	13	2	4	.	121
Syngnathus floridae	.	25	10	28	10	.	.	.	.	73
Syngnathus louisianae	10	13	13	12	13	3	1	6	1	72
Syngnathus scovelli	170	110	114	55	103	3	25	6	4	590
Syngnathus sp.	.	1	.	.	.	.	.	.	.	1
Synodus foetens	37	26	48	48	64	2	12	12	.	249
Trachinotus carolinus	**.**	**.**	**1**	**1**	**4**	**.**	**.**	**.**	**.**	**6**
Trachinotus falcatus	**1**	**17**	**8**	**8**	**16**	**.**	**.**	**.**	**.**	**50**
Trinectes maculatus	2	1	32	.	5	284	358	66	190	938
Tylosurus crocodilus	.	.	.	2	2	.	.	.	.	4
Urophycis floridana	.	.	.	1	.	.	.	.	.	1
Totals	**40,498**	**16,213**	**71,542**	**39,144**	**35,462**	**61,571**	**89,170**	**61,962**	**34,458**	**450,020**

Zones A–E were located in Tampa Bay, while Zones K (Alafia River), L (Little Manatee River), M (Manatee River), and N (Braden River) were tributaries of Tampa Bay. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

A.6 Sarasota Bay

Table A.16: Monthly summary of taxa collected during Sarasota Bay stratified-random sampling, 2023.

Species	Month						Totals
	Feb	Apr	Jun	Aug	Oct	Dec	
	E=26	E=26	E=26	E=26	E=26	E=24	E=154
Acanthostracion quadricornis	21	.	.	2	1	3	27
Achirus lineatus	2	1	.	.	3	5	11
Anchoa mitchilli	.	.	.	41	925	19	985
Archosargus probatocephalus	**22**	**64**	**48**	**117**	**56**	**52**	**359**
Argopecten irradians	**.**	**.**	**.**	**1**	**.**	**.**	**1**
Ariopsis felis	953	3	3	32	14	100	1,105
Astroscopus y-graecum	.	2	.	.	.	.	2
Bagre marinus	8	.	.	.	.	.	8
Bairdiella chrysoura	5	.	23	43	16	12	99
Brevoortia sp.	1	.	.	.	.	.	1
Calamus penna	**.**	**.**	**4**	**1**	**1**	**.**	**6**
***Calamus* spp.**	**1**	**1**	**.**	**.**	**.**	**.**	**2**
Callinectes ornatus	1	4	2	1	2	1	11
Callinectes sapidus	**30**	**21**	**22**	**20**	**36**	**8**	**137**
Callinectes sp.	.	.	.	.	.	1	1
Caranx hippos	**.**	**.**	**.**	**5**	**.**	**75**	**80**
Caranx latus	.	.	.	.	2	.	2
Centropomus undecimalis	**19**	**37**	**4**	**76**	**26**	**77**	**239**
Chaetodipterus faber	.	5	3	2	6	.	16
Chasmodes saburrae	.	.	2	.	2	2	6
Chilomycterus schoepfii	12	4	4	11	12	15	58
Chloroscombrus chrysurus	.	.	.	.	3	.	3
Cynoscion nebulosus	**33**	**1**	**6**	**18**	**16**	**7**	**81**
Cyprinodon variegatus	5	1	2	78	5	13	104
Diapterus auratus	.	.	7	2	75	3	87

Species	Month						Totals
	Feb	Apr	Jun	Aug	Oct	Dec	
	E=26	E=26	E=26	E=26	E=26	E=24	E=154
Diplectrum formosum	**.**	**.**	**1**	**.**	**.**	**.**	**1**
Echeneis neucratoides	.	.	.	.	.	1	1
Elops saurus	**9**	**1**	**.**	**.**	**.**	**25**	**35**
Eucinostomus gula	116	212	151	1,329	1,769	596	4,173
Eucinostomus harengulus	52	29	152	194	209	23	659
Eucinostomus spp.	673	257	5,223	4,366	8,128	2,917	21,564
Eugerres plumieri	.	1	2	6	.	.	9
Farfantepenaeus duorarum	**44**	**18**	**707**	**134**	**284**	**116**	**1,303**
Floridichthys carpio	16	47	28	543	57	368	1,059
Fundulus grandis	4	.	30	94	7	38	173
Fundulus similis	.	.	2	.	.	.	2
Fundulus xenicus	.	.	.	3	.	.	3
Gobiosoma robustum	150	20	11	4	15	12	212
Gobiosoma spp.	8	.	2	2	1	1	14
Gymnura lessae	4	.	.	.	.	1	5
Haemulon plumierii	**.**	**.**	**.**	**.**	**88**	**14**	**102**
Harengula jaguana	.	.	287	2,366	197	223	3,073
Hippocampus erectus	2	.	1	.	.	.	3
Hippocampus zosterae	7	.	7	13	3	6	36
Hypanus sabinus	.	.	.	1	1	3	5
Hypanus say	.	.	1	.	.	3	4
Lagodon rhomboides	1,386	3,157	950	1,959	1,073	1,552	10,077
Leiostomus xanthurus	**2**	**.**	**.**	**.**	**.**	**.**	**2**
Limulus polyphemus	.	1	.	.	.	.	1
Lucania parva	171	173	3,856	7,097	3,252	1,883	16,432
Lutjanus griseus	**1**	**1**	**10**	**29**	**56**	**13**	**110**
Lutjanus synagris	**.**	**.**	**.**	**6**	**17**	**35**	**58**
Menidia spp.	8	25	99	1,056	169	.	1,357
Menticirrhus saxatilis	**6**	**4**	**.**	**.**	**.**	**.**	**10**

Species	Month						Totals
	Feb	Apr	Jun	Aug	Oct	Dec	
	E=26	E=26	E=26	E=26	E=26	E=24	E=154
Microgobius gulosus	106	79	60	33	29	20	327
Monacanthus ciliatus	.	.	.	1	4	.	5
Mugil cephalus	**375**	**14**	**2**	**1**	**4**	**34**	**430**
Mugil curema	**15**	**2**	**.**	**2**	**.**	**2**	**21**
Mugil trichodon	**37**	**4**	**.**	**9**	**.**	**11**	**61**
Mycteroperca microlepis	**.**	**.**	**5**	**7**	**6**	**.**	**18**
Nicholsina usta	.	.	.	.	5	2	7
Ocyurus chrysurus	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Oligoplites saurus	.	.	2	4	21	11	38
Opisthonema oglinum	.	.	3	.	197	46	246
Opsanus beta	2	5	1	14	2	6	30
Orthopristis chrysoptera	.	2	4	25	1	1	33
Paralichthys albigutta	**.**	**.**	**.**	**.**	**.**	**1**	**1**
Poecilia latipinna	.	.	.	2	.	12	14
Pogonias cromis	**.**	**.**	**.**	**6**	**.**	**.**	**6**
Portunus spp.	21	5	2	2	1	2	33
Prionotus scitulus	.	1	2	2	.	.	5
Prionotus tribulus	2	.	.	.	.	4	6
Sardinella aurita	.	1	1	.	.	.	2
Sarotherodon melanotheron	.	.	.	.	5	.	5
Sciaenops ocellatus	**2**	**2**	**.**	**5**	**1**	**4**	**14**
Selene vomer	.	.	.	.	1	2	3
Sicyonia sp.	1	.	.	.	.	.	1
Sphoeroides nephelus	5	76	16	1	6	22	126
Sphoeroides spengleri	.	.	.	1	.	.	1
Sphyraena barracuda	**.**	**.**	**.**	**1**	**8**	**13**	**22**
Stephanolepis hispida	2	12	14	.	.	31	59
Strongylura marina	.	.	3	.	.	.	3
Strongylura notata	.	1	37	36	49	9	132

Species	Month						Totals
	Feb	Apr	Jun	Aug	Oct	Dec	
	E=26	E=26	E=26	E=26	E=26	E=24	E=154
Strongylura timucu	.	.	1	.	.	1	2
Symphurus plagiusa	.	1	.	.	.	.	1
Syngnathus floridae	.	.	.	10	.	4	14
Syngnathus louisianae	3	2	13	1	.	7	26
Syngnathus scovelli	19	17	16	17	11	10	90
Synodus foetens	20	33	13	5	4	12	87
Trachinotus carolinus	**4**	**.**	**.**	**.**	**.**	**1**	**5**
Trachinotus falcatus	**.**	**.**	**1**	**5**	**7**	**.**	**13**
Tylosurus crocodilus	.	.	2	1	.	.	3
Totals	**4,386**	**4,347**	**11,848**	**19,843**	**16,890**	**8,491**	**65,805**

Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.17: Summary by gear and stratum of taxa collected during Sarasota Bay stratified-random sampling, 2023.

Species	Gear and Strata					Totals
	21.3-m bay seine			183-m haul seine		
	Veg	Unveg	Shore	Over	Nonover	
	E=51	E=31	E=36	E=29	E=7	E=154
Acanthostracion quadricornis	3	3	.	1	20	27
Achirus lineatus	1	2	6	2	.	11
Anchoa mitchilli	774	.	211	.	.	985
Archosargus probatocephalus	**20**	**13**	**10**	**240**	**76**	**359**
Argopecten irradians	**.**	**.**	**.**	**.**	**1**	**1**
Ariopsis felis	.	.	.	998	107	1,105
Astroscopus y-graecum	.	.	2	.	.	2
Bagre marinus	.	.	.	8	.	8
Bairdiella chrysoura	67	13	.	3	16	99
Brevoortia sp.	.	.	.	.	1	1
Calamus penna	**.**	**.**	**2**	**3**	**1**	**6**
***Calamus* spp.**	**2**	**.**	**.**	**.**	**.**	**2**
Callinectes ornatus	5	2	2	2	.	11
Callinectes sapidus	**25**	**7**	**28**	**72**	**5**	**137**
Callinectes sp.	1	.	.	.	.	1
Caranx hippos	**.**	**.**	**.**	**5**	**75**	**80**
Caranx latus	.	.	.	2	.	2
Centropomus undecimalis	**1**	**.**	**3**	**179**	**56**	**239**
Chaetodipterus faber	1	.	.	10	5	16
Chasmodes saburrae	1	1	2	2	.	6
Chilomycterus schoepfii	15	4	.	29	10	58
Chloroscombrus chrysurus	1	.	.	2	.	3
Cynoscion nebulosus	**23**	**2**	**2**	**25**	**29**	**81**
Cyprinodon variegatus	7	3	94	.	.	104
Diapterus auratus	.	1	.	79	7	87
Diplectrum formosum	**1**	**.**	**.**	**.**	**.**	**1**

Species	Gear and Strata					Totals
	21.3-m bay seine			183-m haul seine		
	Veg	Unveg	Shore	Over	Nonover	
	E=51	E=31	E=36	E=29	E=7	E=154
Echeneis neucratoides	.	.	.	.	1	1
Elops saurus	**.**	**.**	**.**	**6**	**29**	**35**
Eucinostomus gula	1,363	636	1,553	349	272	4,173
Eucinostomus harengulus	117	270	259	4	9	659
Eucinostomus spp.	10,738	3,075	7,751	.	.	21,564
Eugerres plumieri	.	.	3	1	5	9
Farfantepenaeus duorarum	**998**	**65**	**231**	**6**	**3**	**1,303**
Floridichthys carpio	11	19	1,029	.	.	1,059
Fundulus grandis	2	.	171	.	.	173
Fundulus similis	.	.	2	.	.	2
Fundulus xenicus	.	.	3	.	.	3
Gobiosoma robustum	116	17	79	.	.	212
Gobiosoma spp.	7	3	4	.	.	14
Gymnura lessae	.	.	.	4	1	5
Haemulon plumierii	**18**	**.**	**2**	**81**	**1**	**102**
Harengula jaguana	2,428	463	160	8	14	3,073
Hippocampus erectus	.	1	.	.	2	3
Hippocampus zosterae	25	2	9	.	.	36
Hypanus sabinus	.	.	1	1	3	5
Hypanus say	.	.	.	1	3	4
Lagodon rhomboides	4,172	164	1,220	2,828	1,693	10,077
Leiostomus xanthurus	**1**	**.**	**1**	**.**	**.**	**2**
Limulus polyphemus	.	.	1	.	.	1
Lucania parva	8,297	205	7,929	1	.	16,432
Lutjanus griseus	**35**	**.**	**32**	**40**	**3**	**110**
Lutjanus synagris	**21**	**.**	**12**	**5**	**20**	**58**
Menidia spp.	687	56	614	.	.	1,357
Menticirrhus saxatilis	**2**	**2**	**6**	**.**	**.**	**10**

Species	Gear and Strata					Totals
	21.3-m bay seine			183-m haul seine		
	Veg	Unveg	Shore	Over	Nonover	
	E=51	E=31	E=36	E=29	E=7	E=154
Microgobius gulosus	178	17	132	.	.	327
Monacanthus ciliatus	1	.	.	4	.	5
Mugil cephalus	**.**	**.**	**8**	**379**	**43**	**430**
Mugil curema	**.**	**.**	**.**	**2**	**19**	**21**
Mugil trichodon	**.**	**.**	**18**	**41**	**2**	**61**
Mycteroperca microlepis	**1**	**.**	**.**	**17**	**.**	**18**
Nicholsina usta	2	.	.	5	.	7
Ocyurus chrysurus	**.**	**.**	**.**	**1**	**.**	**1**
Oligoplites saurus	4	3	19	1	11	38
Opisthonema oglinum	210	.	6	.	30	246
Opsanus beta	1	1	2	10	16	30
Orthopristis chrysoptera	6	.	.	15	12	33
Paralichthys albigutta	**.**	**.**	**.**	**.**	**1**	**1**
Poecilia latipinna	.	.	14	.	.	14
Pogonias cromis	**.**	**.**	**.**	**6**	**.**	**6**
Portunus spp.	11	17	4	.	1	33
Prionotus scitulus	.	5	.	.	.	5
Prionotus tribulus	1	4	.	.	1	6
Sardinella aurita	1	.	1	.	.	2
Sarotherodon melanotheron	.	.	.	5	.	5
Sciaenops ocellatus	**3**	**.**	**.**	**10**	**1**	**14**
Selene vomer	.	.	.	1	2	3
Sicyonia sp.	.	1	.	.	.	1
Sphoeroides nephelus	54	27	26	17	2	126
Sphoeroides spengleri	1	.	.	.	.	1
Sphyraena barracuda	**.**	**.**	**2**	**16**	**4**	**22**
Stephanolepis hispida	40	5	6	5	3	59
Strongylura marina	3	.	.	.	.	3

Species	Gear and Strata					Totals
	21.3-m bay seine			183-m haul seine		
	Veg	Unveg	Shore	Over	Nonover	
	E=51	E=31	E=36	E=29	E=7	E=154
Strongylura notata	26	9	69	28	.	132
Strongylura timucu	.	.	2	.	.	2
Symphurus plagiusa	1	.	.	.	.	1
Syngnathus floridae	14	.	.	.	.	14
Syngnathus louisianae	15	8	3	.	.	26
Syngnathus scovelli	54	10	26	.	.	90
Synodus foetens	45	22	11	5	4	87
Trachinotus carolinus	**.**	**.**	**.**	**1**	**4**	**5**
Trachinotus falcatus	**.**	**.**	**4**	**3**	**6**	**13**
Tylosurus crocodilus	.	.	2	1	.	3
Totals	**30,658**	**5,158**	**21,789**	**5,570**	**2,630**	**65,805**

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 183-m haul seine was stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.18: Summary by zone of taxa collected during Sarasota Bay stratified-random sampling, 2023.

Species	Zone					Totals
	A	B	C	D	E	
	E=24	E=48	E=30	E=24	E=28	E=154
Acanthostracion quadricornis	.	27	.	.	.	27
Achirus lineatus	.	3	2	4	2	11
Anchoa mitchilli	.	11	19	949	6	985
Archosargus probatocephalus	**18**	**117**	**39**	**119**	**66**	**359**
Argopecten irradians	**.**	**1**	**.**	**.**	**.**	**1**
Ariopsis felis	1	110	.	968	26	1,105
Astroscopus y-graecum	.	2	.	.	.	2
Bagre marinus	.	.	.	8	.	8
Bairdiella chrysoura	10	43	15	18	13	99
Brevoortia sp.	1	.	.	.	.	1
Calamus penna	**.**	**3**	**2**	**.**	**1**	**6**
***Calamus* spp.**	**.**	**.**	**1**	**.**	**1**	**2**
Callinectes ornatus	1	3	1	4	2	11
Callinectes sapidus	**19**	**25**	**12**	**51**	**30**	**137**
Callinectes sp.	.	.	1	.	.	1
Caranx hippos	**.**	**75**	**.**	**5**	**.**	**80**
Caranx latus	.	2	.	.	.	2
Centropomus undecimalis	**31**	**63**	**38**	**58**	**49**	**239**
Chaetodipterus faber	.	4	3	8	1	16
Chasmodes saburrae	.	2	1	1	2	6
Chilomycterus schoepfii	7	16	5	3	27	58
Chloroscombrus chrysurus	.	1	.	2	.	3
Cynoscion nebulosus	**31**	**12**	**7**	**17**	**14**	**81**
Cyprinodon variegatus	71	28	.	4	1	104
Diapterus auratus	.	1	6	25	55	87
Diplectrum formosum	**.**	**1**	**.**	**.**	**.**	**1**
Echeneis neucratoides	.	1	.	.	.	1

Species	Zone					Totals
	A	B	C	D	E	
	E=24	E=48	E=30	E=24	E=28	E=154
Elops saurus	**4**	**25**	**.**	**5**	**1**	**35**
Eucinostomus gula	473	1,326	1,333	288	753	4,173
Eucinostomus harengulus	162	127	137	126	107	659
Eucinostomus spp.	3,424	4,895	6,591	3,388	3,266	21,564
Eugerres plumieri	.	5	1	3	.	9
Farfantepenaeus duorarum	**64**	**149**	**825**	**123**	**142**	**1,303**
Floridichthys carpio	693	314	31	21	.	1,059
Fundulus grandis	77	55	30	.	11	173
Fundulus similis	.	2	.	.	.	2
Fundulus xenicus	.	3	.	.	.	3
Gobiosoma robustum	5	154	36	10	7	212
Gobiosoma spp.	2	2	8	2	.	14
Gymnura lessae	.	1	.	4	.	5
Haemulon plumierii	**.**	**73**	**.**	**.**	**29**	**102**
Harengula jaguana	114	157	745	275	1,782	3,073
Hippocampus erectus	2	.	.	.	1	3
Hippocampus zosterae	5	14	15	.	2	36
Hypanus sabinus	.	3	.	2	.	5
Hypanus say	1	3	.	.	.	4
Lagodon rhomboides	331	4,757	516	414	4,059	10,077
Leiostomus xanthurus	**1**	**1**	**.**	**.**	**.**	**2**
Limulus polyphemus	1	.	.	.	.	1
Lucania parva	3,833	6,956	134	2,415	3,094	16,432
Lutjanus griseus	**3**	**35**	**4**	**13**	**55**	**110**
Lutjanus synagris	**.**	**32**	**.**	**.**	**26**	**58**
Menidia spp.	29	894	295	126	13	1,357
Menticirrhus saxatilis	**1**	**4**	**.**	**1**	**4**	**10**
Microgobius gulosus	16	164	46	98	3	327
Monacanthus ciliatus	.	5	.	.	.	5

Species	Zone					Totals
	A	B	C	D	E	
	E=24	E=48	E=30	E=24	E=28	E=154
Mugil cephalus	**44**	**16**	**319**	**28**	**23**	**430**
Mugil curema	**15**	**6**	**.**	**.**	**.**	**21**
Mugil trichodon	**9**	**14**	**19**	**13**	**6**	**61**
Mycteroperca microlepis	**1**	**3**	**1**	**.**	**13**	**18**
Nicholsina usta	.	5	.	.	2	7
Ocyurus chrysurus	**.**	**1**	**.**	**.**	**.**	**1**
Oligoplites saurus	13	16	3	5	1	38
Opisthonema oglinum	.	30	3	202	11	246
Opsanus beta	7	18	2	.	3	30
Orthopristis chrysoptera	.	18	.	.	15	33
Paralichthys albigutta	**.**	**1**	**.**	**.**	**.**	**1**
Poecilia latipinna	.	14	.	.	.	14
Pogonias cromis	**.**	**.**	**6**	**.**	**.**	**6**
Portunus spp.	11	14	7	1	.	33
Prionotus scitulus	2	1	.	.	2	5
Prionotus tribulus	3	1	1	1	.	6
Sardinella aurita	.	1	1	.	.	2
Sarotherodon melanotheron	5	.	.	.	.	5
Sciaenops ocellatus	**2**	**5**	**1**	**3**	**3**	**14**
Selene vomer	1	2	.	.	.	3
Sicyonia sp.	.	1	.	.	.	1
Sphoeroides nephelus	6	63	8	6	43	126
Sphoeroides spengleri	.	.	1	.	.	1
Sphyraena barracuda	**.**	**11**	**3**	**.**	**8**	**22**
Stephanolepis hispida	.	16	3	.	40	59
Strongylura marina	.	2	1	.	.	3
Strongylura notata	13	57	21	19	22	132
Strongylura timucu	.	1	.	.	1	2
Symphurus plagiusa	.	.	1	.	.	1

Species	Zone					Totals
	A	B	C	D	E	
	E=24	E=48	E=30	E=24	E=28	E=154
Syngnathus floridae	.	7	2	.	5	14
Syngnathus louisianae	.	5	2	1	18	26
Syngnathus scovelli	16	32	21	14	7	90
Synodus foetens	9	28	12	4	34	87
Trachinotus carolinus	**4**	**.**	**1**	**.**	**.**	**5**
Trachinotus falcatus	**3**	**9**	**1**	**.**	**.**	**13**
Tylosurus crocodilus	.	2	.	.	1	3
Totals	**9,595**	**21,107**	**11,339**	**9,855**	**13,909**	**65,805**

Zones A–E are the five embayments designated by the Sarasota Bay Estuary Program. Effort, or the total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

A.7 Charlotte Harbor

Table A.19: Monthly summary of taxa collected during Charlotte Harbor stratified-random sampling, 2023.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=123	E=93	E=57	E=117	E=57	E=93	E=81	E=93	E=99	E=117	E=99	E=93	E=1,122
Acanthostracion quadricornis	22	3	1	9	3	1	9	2	.	6	.	2	58
Achirus lineatus	25	4	1	22	4	6	25	45	25	70	45	4	276
Aluterus schoepfii	.	.	.	.	1	5	2	3	.	.	.	1	12
Anarchopterus criniger	3	1	.	5	.	1	4	.	.	.	.	1	15
Anchoa hepsetus	.	.	.	30	.	.	.	.	1	.	.	.	31
Anchoa mitchilli	10,726	2,907	377	13,705	1	27	46	5,830	18,200	2,629	19,702	7,891	82,041
Ancylopsetta quadrocellata	.	1	.	.	.	.	.	.	.	.	.	.	1
Archosargus probatocephalus	**25**	**53**	**22**	**36**	**81**	**46**	**66**	**97**	**116**	**116**	**63**	**284**	**1,005**
Archosargus rhomboidalis	.	.	.	.	1	.	.	.	.	.	.	.	1
Archosargus spp.	.	.	.	.	.	.	.	1	.	1	.	.	2
Ariopsis felis	239	30	290	138	140	86	88	299	431	99	23	3	1,866
Astroscopus y-graecum	.	.	1	.	.	.	.	.	.	.	.	.	1
Bagre marinus	.	.	1	.	4	.	.	.	3	2	2	5	17
Bairdiella chrysoura	8	20	18	252	81	273	1,117	246	298	1,487	53	23	3,876
Bathygobius soporator	12	17	1	6	.	.	4	.	3	3	5	2	53
***Brevoortia* spp.**	**1**	**.**	**.**	**1**	**.**	**6**	**.**	**.**	**.**	**.**	**.**	**.**	**8**
Calamus arctifrons	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**1**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=123	E=93	E=57	E=117	E=57	E=93	E=81	E=93	E=99	E=117	E=99	E=93	E=1,122
Calamus penna	1	.	1	3	11	2	4	5	.	1	4	7	39
Calamus proridens	.	.	1	.	1	.	1	.	.	.	.	.	3
***Calamus* spp.**	1	1	.	2	.	.	.	.	.	.	.	1	5
Callinectes ornatus	1	2	1	.	4	6	4	1	.	.	.	1	20
Callinectes sapidus	127	35	43	32	10	24	28	33	118	125	55	26	656
Caranx hippos	1	.	1	6	15	10	.	1	15	8	1	8	66
Caranx latus	.	.	.	.	.	.	.	.	1	.	1	1	3
Carcharhinus leucas	.	.	.	.	.	.	.	.	1	.	.	1	2
Centropomus undecimalis	68	129	58	69	30	112	40	42	75	66	46	561	1,296
Centropristis striata	.	.	.	.	.	.	1	.	.	.	.	.	1
Chaetodipterus faber	3	.	4	12	6	8	14	7	39	127	4	.	224
Chasmodes saburrae	.	.	8	14	17	9	24	27	11	6	8	1	125
Chilomycterus schoepfii	47	16	29	30	13	24	19	32	32	44	29	71	386
Chloroscombrus chrysurus	.	.	.	.	1	4	.	1	.	.	.	.	6
Citharichthys macrops	.	.	.	3	.	.	.	.	.	.	.	.	3
Ctenogobius smaragdus	7	4	1	2	.	.	.	1	.	.	.	.	15
Cynoscion arenarius	2	.	5	.	.	.	4	2	55	57	18	.	143
Cynoscion nebulosus	2	3	7	45	8	41	54	94	255	65	31	11	616
Cyprinodon variegatus	335	90	10	238	136	71	.	4	1	30	404	38	1,357
Diapterus auratus	6	6	41	7	1	13	5	59	17	14	9	17	195

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=123	E=93	E=57	E=117	E=57	E=93	E=81	E=93	E=99	E=117	E=99	E=93	E=1,122
Diplectrum formosum	**1**	**.**	**.**	**.**	**.**	**.**	**14**	**2**	**.**	**11**	**.**	**3**	**31**
Elopiformes sp.	1	.	.	.	.	.	.	.	.	.	.	.	1
Elops saurus	**13**	**25**	**.**	**1**	**31**	**7**	**6**	**10**	**31**	**4**	**11**	**79**	**218**
Epinephelus itajara	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**1**
Epinephelus morio	**.**	**.**	**.**	**.**	**.**	**.**	**3**	**1**	**7**	**5**	**.**	**.**	**16**
Etropus crossotus	6	.	.	2	.	.	14	.	.	34	.	.	56
Eucinostomus gula	571	642	659	465	588	594	1,673	1,530	1,705	2,107	2,087	4,545	17,166
Eucinostomus harengulus	486	785	489	595	293	848	442	938	1,136	505	419	574	7,510
Eucinostomus spp.	2,155	1,952	714	1,364	1,554	7,385	4,651	5,496	5,751	7,749	9,892	6,056	54,719
Eugerres plumieri	39	23	.	155	53	77	286	855	908	214	97	77	2,784
Farfantepenaeus duorarum	**274**	**66**	**39**	**30**	**58**	**248**	**938**	**345**	**1,126**	**389**	**239**	**82**	**3,834**
Floridichthys carpio	216	23	40	9	22	47	9	49	109	441	156	26	1,147
Fundulus confluentus	14	7	.	1	.	.	.	.	.	1	.	4	27
Fundulus grandis	42	18	1	.	.	.	6	12	50	181	4	26	340
Fundulus similis	.	.	.	1	.	.	.	.	147	67	.	1	216
Fundulus xenicus	.	5	.	.	.	.	.	2	.	1	.	46	54
Gambusia holbrooki	591	758	.	2	.	1	.	4	1	18	3	25	1,403
Gobiesox strumosus	.	.	.	.	1	.	3	.	.	1	1	1	7
Gobiosoma bosc	.	2	.	2	.	4	1	7	17	1	4	6	44
Gobiosoma longipala	4	.	.	2	.	.	4	.	.	.	.	.	10

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=123	E=93	E=57	E=117	E=57	E=93	E=81	E=93	E=99	E=117	E=99	E=93	E=1,122
Gobiosoma robustum	80	38	29	159	79	76	116	29	52	15	22	31	726
Gobiosoma spp.	12	4	.	43	10	29	64	22	60	15	6	10	275
Gymnura lessae	1	.	.	.	.	.	.	.	.	.	.	.	1
Haemulon aurolineatum	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**3**	**.**	**3**
Haemulon plumierii	**1**	**.**	**.**	**.**	**.**	**1**	**128**	**.**	**23**	**229**	**137**	**4**	**523**
Harengula jaguana	1	10	34	5	7	1,868	1,008	2,177	1,418	573	397	1,855	9,353
Hemiramphus brasiliensis	.	.	.	.	.	1	.	.	.	.	.	.	1
Hippocampus erectus	17	1	3	5	1	.	6	.	.	5	4	1	43
Hippocampus zosterae	10	6	4	7	9	3	4	6	1	1	5	5	61
Hypanus americanus	.	.	2	1	1	1	1	.	3	13	5	3	30
Hypanus sabinus	8	.	30	6	13	1	6	8	14	3	13	2	104
Hypanus say	1	.	.	13	.	2	1	.	1	1	2	.	21
Hypanus sp.	.	.	.	.	.	.	.	.	.	1	.	.	1
Hypleurochilus caudovittatus	1	.	.	.	.	.	.	.	.	.	.	.	1
Hyporhamphus meeki	.	.	.	1	.	.	.	.	.	2	4	.	7
Hyporhamphus spp.	.	.	.	1	.	.	1	.	.	.	.	.	2
Hyporhamphus unifasciatus	1	.	.	.	1	.	.	.	3	3	.	3	11
Hypsoblennius hentz	.	1	1	.	.	.	1	.	.	.	.	1	4
Lagodon rhomboides	292	635	1,775	2,476	1,966	2,623	2,704	5,399	4,791	6,924	3,096	1,443	34,124
Leiostomus xanthurus	**.**	**77**	**.**	**.**	**2**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**79**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=123	E=93	E=57	E=117	E=57	E=93	E=81	E=93	E=99	E=117	E=99	E=93	E=1,122
Lepisosteus platyrhincus	.	.	.	1	.	.	.	.	.	3	.	.	4
Limulus polyphemus	.	.	.	4	1	2	5	.	.	1	.	.	13
Lophogobius cyprinoides	40	4	7	42	.	10	2	91	146	52	7	13	414
Lucania parva	1,976	536	652	1,641	3,464	2,128	1,156	8,301	1,697	1,719	1,809	633	25,712
Lupinoblennius nicholsi	.	1	.	.	.	.	.	1	.	1	.	.	3
Lutjanus analis	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**.**	**2**
Lutjanus griseus	**11**	**.**	**4**	**29**	**6**	**21**	**21**	**59**	**70**	**51**	**35**	**39**	**346**
Lutjanus synagris	**3**	**.**	**.**	**.**	**.**	**.**	**120**	**46**	**11**	**218**	**28**	**10**	**436**
Mayaheros urophthalmus	19	1	.	.	.	.	1	2	4	60	13	.	100
Megalops atlanticus	**.**	**.**	**.**	**.**	**2**	**2**	**.**	**.**	**.**	**.**	**.**	**.**	**4**
Membras martinica	.	.	.	.	.	223	50	.	.	.	.	.	273
Menidia spp.	1,231	1,202	689	1,818	202	451	15	540	1,645	797	761	438	9,789
***Menippe* spp.**	**17**	**1**	**.**	**1**	**.**	**.**	**16**	**.**	**.**	**34**	**.**	**1**	**70**
Menticirrhus americanus	**70**	**.**	**101**	**24**	**.**	**.**	**9**	**7**	**7**	**12**	**41**	**.**	**271**
Menticirrhus saxatilis	**2**	**1**	**13**	**.**	**1**	**1**	**.**	**1**	**.**	**.**	**.**	**1**	**20**
Microgobius gulosus	121	109	45	547	180	619	237	394	764	163	230	167	3,576
Microgobius microlepis	1	.	.	.	.	.	1	.	.	.	.	.	2
Microgobius thalassinus	1	.	.	1	.	.	.	.	1	.	.	.	3
Monacanthus ciliatus	.	.	.	.	.	.	14	3	.	9	4	3	33
Mugil cephalus	**5**	**28**	**6**	**15**	**12**	**5**	**3**	**2**	**11**	**3**	**37**	**17**	**144**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=123	E=93	E=57	E=117	E=57	E=93	E=81	E=93	E=99	E=117	E=99	E=93	E=1,122
Mugil curema	**7**	**2**	**2**	**14**	**21**	**7**	**.**	**1**	**2**	**3**	**.**	**13**	**72**
Mugil trichodon	**23**	**7**	**11**	**1**	**6**	**34**	**1**	**2**	**7**	**23**	**30**	**14**	**159**
Mycteroperca bonaci	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**1**
Mycteroperca microlepis	**.**	**.**	**.**	**8**	**.**	**5**	**25**	**14**	**9**	**26**	**9**	**1**	**97**
Myrophis punctatus	.	1	.	.	1	.	.	.	.	.	.	.	2
Negaprion brevirostris	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**1**	**.**	**.**	**.**	**.**	**2**
Nicholsina usta	.	.	.	.	.	.	9	1	.	3	.	2	15
Ocyurus chrysurus	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**.**	**18**	**.**	**.**	**20**
Ogcocephalus cubifrons	2	.	.	.	.	.	.	.	.	1	.	.	3
Oligoplites saurus	1	1	1	7	5	38	37	71	81	20	2	2	266
Opisthonema oglinum	.	.	.	1	9	30	350	.	3,932	60	2	11	4,395
Opsanus beta	16	.	4	10	6	9	76	5	23	55	3	15	222
Sarotherodon spp.	.	.	1	1	.	2	.	.	.	.	.	.	4
Orthopristis chrysoptera	.	5	16	20	1	3	101	12	11	55	.	1	225
Paralichthys albigutta	**3**	**1**	**4**	**2**	**1**	**.**	**4**	**1**	**2**	**5**	**1**	**1**	**25**
Poecilia latipinna	336	345	.	7	.	9	.	30	664	133	.	38	1,562
Pogonias cromis	**.**	**1**	**.**	**2**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**1**	**5**
Pomatomus saltatrix	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**
Portunus spp.	789	37	3	376	8	7	823	.	5	133	1	2	2,184
Prionotus rubio	6	.	.	.	.	.	.	.	.	.	.	.	6

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=123	E=93	E=57	E=117	E=57	E=93	E=81	E=93	E=99	E=117	E=99	E=93	E=1,122
Prionotus scitulus	75	1	1	22	9	1	115	1	20	96	2	4	347
Prionotus tribulus	18	4	2	1	.	.	1	.	1	13	5	.	45
Rhinoptera bonasus	.	.	1	.	.	31	.	.	.	.	.	.	32
Rimapenaeus constrictus	9	.	.	1	.	.	.	.	.	.	.	.	10
Rimapenaeus spp.	4	.	.	.	.	.	1	.	.	4	.	.	9
Sarotherodon melanotheron	.	.	.	.	.	1	.	2	.	.	.	4	7
Sciaenops ocellatus	**436**	**107**	**34**	**8**	**7**	**5**	**5**	**15**	**36**	**82**	**231**	**71**	**1,037**
Scorpaena brasiliensis	1	.	.	.	.	.	.	.	.	.	.	.	1
Selene vomer	.	.	.	.	.	1	.	.	.	.	.	.	1
Serraniculus pumilio	6	1	.	.	.	.	.	.	.	1	.	.	8
Serranus subligarius	.	.	.	.	.	.	1	.	.	.	1	.	2
Sicyonia laevigata	3	.	.	.	.	.	.	.	.	.	.	.	3
Sicyonia typica	1	.	.	1	.	.	.	.	.	.	.	.	2
Sphoeroides nephelus	26	49	34	75	36	40	33	61	78	77	44	45	598
Sphoeroides spengleri	.	.	1	.	.	.	5	.	.	.	7	1	14
Sphyraena barracuda	**.**	**.**	**2**	**.**	**.**	**.**	**2**	**.**	**6**	**6**	**16**	**4**	**36**
Sphyraena borealis	.	.	.	2	.	.	.	.	.	.	.	.	2
Sphyrna tiburo	**.**	**.**	**2**	**1**	**.**	**2**	**.**	**1**	**.**	**.**	**1**	**.**	**7**
Stephanolepis hispida	12	2	1	5	2	1	34	1	.	2	14	21	95
Strongylura marina	5	.	.	6	.	6	.	1	.	3	34	11	66

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=123	E=93	E=57	E=117	E=57	E=93	E=81	E=93	E=99	E=117	E=99	E=93	E=1,122
Strongylura notata	28	19	69	63	65	206	51	239	244	133	73	66	1,256
Strongylura spp.	1	1	.	9	1	.	.	.	.	.	1	.	13
Strongylura timucu	1	1	.	3	3	2	.	10	2	3	2	4	31
Symphurus plagiusa	53	3	2	8	.	.	9	2	10	39	13	2	141
Syngnathus floridae	5	8	.	6	.	2	36	2	16	10	27	3	115
Syngnathus louisianae	15	4	1	6	14	6	22	.	1	18	6	2	95
Syngnathus scovelli	25	42	26	140	72	64	53	28	81	26	35	36	628
Synodus foetens	35	19	24	46	22	12	30	8	16	47	12	13	284
Trachinotus carolinus	**8**	**.**	**.**	**9**	**.**	**23**	**.**	**.**	**3**	**6**	**1**	**5**	**55**
Trachinotus falcatus	**47**	**.**	**8**	**.**	**.**	**8**	**57**	**3**	**13**	**3**	**1**	**.**	**140**
Trinectes maculatus	167	12	13	14	15	2	242	53	141	208	21	4	892
Tylosurus crocodilus	.	.	.	.	.	.	.	3	.	.	.	.	3
Urophycis floridana	2	.	.	.	.	.	.	.	.	.	.	.	2
Totals	**22,163**	**10,956**	**6,523**	**25,011**	**9,430**	**18,610**	**17,425**	**33,739**	**46,812**	**28,909**	**40,670**	**25,589**	**285,837**

Effort, or total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.20: Summary by gear and stratum of taxa collected during Charlotte Harbor stratified-random sampling, 2023.

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=133	E=71	E=204	E=315	E=63	E=154	E=50	E=132	E=1,122
Acanthostracion quadricornis	3	.	.	.	.	4	19	32	58
Achirus lineatus	41	30	82	62	11	4	2	44	276
Aluterus schoepfii	.	1	.	.	.	6	3	2	12
Anarchopterus criniger	4	.	1	.	.	.	.	10	15
Anchoa hepsetus	1	.	.	30	.	.	.	.	31
Anchoa mitchilli	315	224	17,799	27,914	30,265	.	.	5,524	82,041
Ancylopsetta quadrocellata	.	.	.	.	.	1	.	.	1
Archosargus probatocephalus	**29**	**2**	**102**	**49**	**8**	**716**	**92**	**7**	**1,005**
Archosargus rhomboidalis	.	.	.	.	.	.	1	.	1
Archosargus spp.	.	.	.	.	.	2	.	.	2
Ariopsis felis	3	22	13	12	.	1,627	183	6	1,866
Astroscopus y-graecum	.	.	1	.	.	.	.	.	1
Bagre marinus	.	.	.	.	.	16	.	1	17
Bairdiella chrysoura	582	20	198	290	1	178	1,363	1,244	3,876
Bathygobius soporator	.	2	10	9	32	.	.	.	53
***Brevoortia* spp.**	**.**	**.**	**1**	**6**	**.**	**.**	**1**	**.**	**8**
Calamus arctifrons	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Calamus penna	**3**	**6**	**1**	**.**	**.**	**19**	**10**	**.**	**39**
Calamus proridens	**.**	**.**	**1**	**.**	**.**	**1**	**.**	**1**	**3**
***Calamus* spp.**	**3**	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**5**
Callinectes ornatus	1	.	12	2	.	.	.	5	20
Callinectes sapidus	**41**	**22**	**72**	**82**	**11**	**166**	**116**	**146**	**656**
Caranx hippos	**.**	**.**	**.**	**.**	**.**	**62**	**4**	**.**	**66**
Caranx latus	.	.	.	.	.	3	.	.	3
Carcharhinus leucas	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**.**	**2**
Centropomus undecimalis	**.**	**2**	**22**	**611**	**14**	**612**	**35**	**.**	**1,296**

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=133	E=71	E=204	E=315	E=63	E=154	E=50	E=132	E=1,122
Centropristis striata	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**1**
Chaetodipterus faber	3	5	7	.	5	134	13	57	224
Chasmodes saburrae	58	4	45	11	1	.	.	6	125
Chilomycterus schoepfii	35	3	8	.	.	152	129	59	386
Chloroscombrus chrysurus	.	.	1	1	.	2	2	.	6
Citharichthys macrops	.	.	.	.	.	.	.	3	3
Ctenogobius smaragdus	1	2	4	6	2	.	.	.	15
Cynoscion arenarius	**1**	**2**	**1**	**3**	**.**	**.**	**.**	**136**	**143**
Cynoscion nebulosus	**188**	**33**	**138**	**115**	**1**	**68**	**51**	**22**	**616**
Cyprinodon variegatus	119	5	451	780	2	.	.	.	1,357
Diapterus auratus	.	.	2	44	24	83	42	.	195
Diplectrum formosum	**1**	**.**	**.**	**.**	**.**	**2**	**4**	**24**	**31**
Elopiformes sp.	1	.	.	.	.	.	.	.	1
Elops saurus	**.**	**.**	**.**	**2**	**2**	**133**	**81**	**.**	**218**
Epinephelus itajara	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Epinephelus morio	**.**	**.**	**1**	**.**	**.**	**7**	**5**	**3**	**16**
Etropus crossotus	.	.	.	.	.	.	.	56	56
Eucinostomus gula	1,755	545	5,188	1,775	183	4,180	2,071	1,469	17,166
Eucinostomus harengulus	203	227	1,830	4,059	448	680	41	22	7,510
Eucinostomus spp.	9,620	1,768	22,678	17,607	2,567	.	.	479	54,719
Eugerres plumieri	23	53	479	1,838	142	211	.	38	2,784
Farfantepenaeus duorarum	**718**	**252**	**1,344**	**446**	**189**	**21**	**.**	**864**	**3,834**
Floridichthys carpio	157	14	937	24	15	.	.	.	1,147
Fundulus confluentus	.	.	18	8	1	.	.	.	27
Fundulus grandis	.	1	232	42	65	.	.	.	340
Fundulus similis	.	.	1	1	214	.	.	.	216
Fundulus xenicus	.	1	7	46	.	.	.	.	54
Gambusia holbrooki	.	.	12	772	619	.	.	.	1,403

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=133	E=71	E=204	E=315	E=63	E=154	E=50	E=132	E=1,122
Gobiesox strumosus	.	.	3	2	1	.	.	1	7
Gobiosoma bosc	1	2	1	30	10	.	.	.	44
Gobiosoma longipala	.	.	.	.	.	.	.	10	10
Gobiosoma robustum	130	30	273	130	39	.	.	124	726
Gobiosoma spp.	24	18	62	85	17	.	.	69	275
Gymnura lessae	.	.	.	.	.	.	.	1	1
Haemulon aurolineatum	**.**	**.**	**3**	**.**	**.**	**.**	**.**	**.**	**3**
Haemulon plumierii	**108**	**.**	**18**	**.**	**.**	**167**	**169**	**61**	**523**
Harengula jaguana	799	188	1,902	4,460	4	1,584	406	10	9,353
Hemiramphus brasiliensis	.	.	.	.	.	.	1	.	1
Hippocampus erectus	6	5	1	.	.	.	1	30	43
Hippocampus zosterae	34	.	24	1	1	.	.	1	61
Hypanus americanus	.	.	.	.	.	14	16	.	30
Hypanus sabinus	1	.	5	3	1	89	5	.	104
Hypanus say	.	.	.	.	.	18	3	.	21
Hypanus sp.	.	.	.	.	.	1	.	.	1
Hypleurochilus caudovittatus	.	.	.	.	.	.	.	1	1
Hyporhamphus meeki	1	.	.	.	.	.	6	.	7
Hyporhamphus spp.	.	.	2	.	.	.	.	.	2
Hyporhamphus unifasciatus	.	1	.	.	.	6	4	.	11
Hypsoblennius hentz	1	.	2	.	.	.	.	1	4
Lagodon rhomboides	3,576	119	2,279	151	2	18,112	8,764	1,121	34,124
Leiostomus xanthurus	**.**	**.**	**.**	**77**	**.**	**2**	**.**	**.**	**79**
Lepisosteus platyrhincus	.	.	.	4	.	.	.	.	4
Limulus polyphemus	.	.	6	2	.	5	.	.	13
Lophogobius cyprinoides	5	3	11	209	186	.	.	.	414
Lucania parva	9,849	648	10,274	4,722	217	.	.	2	25,712
Lupinoblennius nicholsi	.	.	.	1	1	.	.	1	3

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=133	E=71	E=204	E=315	E=63	E=154	E=50	E=132	E=1,122
Lutjanus analis	.	.	.	.	.	.	2	.	2
Lutjanus griseus	37	7	70	47	14	137	26	8	346
Lutjanus synagris	99	3	9	.	.	120	25	180	436
Mayaheros urophthalmus	.	.	1	76	23	.	.	.	100
Megalops atlanticus	.	.	.	.	.	4	.	.	4
Membras martinica	.	.	50	.	223	.	.	.	273
Menidia spp.	189	40	2,304	6,408	848	.	.	.	9,789
***Menippe* spp.**	.	.	.	.	.	2	.	68	70
Menticirrhus americanus	7	3	39	13	15	.	.	194	271
Menticirrhus saxatilis	4	1	10	.	.	.	1	4	20
Microgobius gulosus	791	342	771	1,432	171	.	.	69	3,576
Microgobius microlepis	.	.	.	.	.	.	.	2	2
Microgobius thalassinus	1	.	.	.	.	.	.	2	3
Monacanthus ciliatus	3	.	3	.	.	7	4	16	33
Mugil cephalus	.	.	2	8	.	106	28	.	144
Mugil curema	1	.	.	2	1	67	1	.	72
Mugil trichodon	.	.	22	9	1	106	21	.	159
Mycteroperca bonaci	.	.	.	.	.	1	.	.	1
Mycteroperca microlepis	4	.	2	.	.	29	28	34	97
Myrophis punctatus	1	.	.	1	.	.	.	.	2
Negaprion brevirostris	.	.	.	.	.	2	.	.	2
Nicholsina usta	.	.	.	.	.	.	3	12	15
Ocyurus chrysurus	.	.	.	.	.	12	5	3	20
Ogcocephalus cubifrons	.	.	.	.	.	1	.	2	3
Oligoplites saurus	11	4	99	76	19	45	12	.	266
Opisthonema oglinum	353	3	288	1,198	2,496	23	33	1	4,395
Opsanus beta	8	1	11	16	.	60	6	120	222
Sarotherodon spp.	.	.	2	1	1	.	.	.	4

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=133	E=71	E=204	E=315	E=63	E=154	E=50	E=132	E=1,122
Orthopristis chrysoptera	22	5	14	.	.	27	90	67	225
Paralichthys albigutta	**3**	**.**	**2**	**.**	**.**	**6**	**10**	**4**	**25**
Poecilia latipinna	.	.	383	1,028	151	.	.	.	1,562
Pogonias cromis	**.**	**.**	**.**	**.**	**.**	**5**	**.**	**.**	**5**
Pomatomus saltatrix	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Portunus spp.	6	12	8	1	.	31	9	2,117	2,184
Prionotus rubio	.	.	.	.	.	.	.	6	6
Prionotus scitulus	15	12	6	.	.	5	11	298	347
Prionotus tribulus	2	2	5	1	.	3	2	30	45
Rhinoptera bonasus	.	.	.	.	.	31	.	1	32
Rimapenaeus constrictus	.	.	.	.	.	.	.	10	10
Rimapenaeus spp.	.	.	1	.	.	.	.	8	9
Sarotherodon melanotheron	.	.	.	4	1	2	.	.	7
Sciaenops ocellatus	**12**	**20**	**243**	**523**	**26**	**172**	**41**	**.**	**1,037**
Scorpaena brasiliensis	.	.	.	.	.	.	.	1	1
Selene vomer	.	.	.	.	.	1	.	.	1
Serraniculus pumilio	1	.	.	.	.	.	.	7	8
Serranus subligarius	1	.	.	.	.	.	.	1	2
Sicyonia laevigata	.	.	.	.	.	.	.	3	3
Sicyonia typica	.	.	.	.	.	.	.	2	2
Sphoeroides nephelus	67	14	75	6	.	254	166	16	598
Sphoeroides spengleri	4	.	2	.	.	3	.	5	14
Sphyraena barracuda	**.**	**.**	**2**	**6**	**.**	**28**	**.**	**.**	**36**
Sphyraena borealis	1	.	.	.	.	.	.	1	2
Sphyrna tiburo	**.**	**.**	**.**	**.**	**.**	**5**	**2**	**.**	**7**
Stephanolepis hispida	29	2	7	.	.	5	8	44	95
Strongylura marina	.	.	4	8	2	32	20	.	66
Strongylura notata	18	3	318	518	155	219	25	.	1,256

Species	Gear and Strata								Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		6.1-m otter trawl	
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover		
	E=133	E=71	E=204	E=315	E=63	E=154	E=50	E=132	E=1,122
Strongylura spp.	1	1	3	8	.	.	.	.	13
Strongylura timucu	.	.	12	10	6	3	.	.	31
Symphurus plagiusa	12	9	22	7	.	1	.	90	141
Syngnathus floridae	69	.	5	.	.	.	.	41	115
Syngnathus louisianae	27	3	13	.	.	.	.	52	95
Syngnathus scovelli	393	25	103	34	11	.	.	62	628
Synodus foetens	42	24	60	10	8	23	14	103	284
Trachinotus carolinus	**.**	**.**	**.**	**.**	**.**	**48**	**7**	**.**	**55**
Trachinotus falcatus	**.**	**.**	**14**	**.**	**.**	**21**	**105**	**.**	**140**
Trinectes maculatus	1	5	4	110	62	7	1	702	892
Tylosurus crocodilus	.	.	.	.	.	3	.	.	3
Urophycis floridana	.	.	.	.	.	.	.	2	2
Totals	**30,679**	**4,801**	**71,556**	**78,085**	**39,535**	**30,747**	**14,350**	**16,084**	**285,837**

Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or offshore) within 5-m. Offshore sets were further stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 21.3-m river seine and 183-m haul seine was stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Sampling with 6.1-m otter trawl was not stratified. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.21: Summary by zone of taxa collected during Charlotte Harbor stratified-random sampling, 2023.

Species	Zone							Totals
	A	B	C	D	K	M	P	
	E=298	E=258	E=258	E=164	E=36	E=54	E=54	E=1,122
Acanthostracion quadricornis	3	17	8	30	.	.	.	58
Achirus lineatus	131	26	66	18	11	4	20	276
Aluterus schoepfii	2	8	.	2	.	.	.	12
Anarchopterus criniger	.	.	2	13	.	.	.	15
Anchoa hepsetus	.	1	.	.	.	30	.	31
Anchoa mitchilli	15,851	20,259	4,619	29	22,110	14,808	4,365	82,041
Ancylopsetta quadrocellata	.	1	.	.	.	.	.	1
Archosargus probatocephalus	**127**	**221**	**357**	**285**	**5**	**6**	**4**	**1,005**
Archosargus rhomboidalis	.	.	.	1	.	.	.	1
Archosargus spp.	.	1	.	1	.	.	.	2
Ariopsis felis	874	89	841	53	.	.	9	1,866
Astroscopus y-graecum	.	1	.	.	.	.	.	1
Bagre marinus	10	.	6	1	.	.	.	17
Bairdiella chrysoura	1,733	1,533	249	276	.	23	62	3,876
Bathygobius soporator	9	3	4	.	25	4	8	53
***Brevoortia* spp.**	**1**	**1**	**5**	**.**	**.**	**1**	**.**	**8**
Calamus arctifrons	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Calamus penna	**1**	**22**	**2**	**14**	**.**	**.**	**.**	**39**
Calamus proridens	**.**	**2**	**.**	**1**	**.**	**.**	**.**	**3**
***Calamus* spp.**	**.**	**1**	**1**	**3**	**.**	**.**	**.**	**5**
Callinectes ornatus	.	3	8	9	.	.	.	20
Callinectes sapidus	**304**	**144**	**60**	**56**	**4**	**49**	**39**	**656**
Caranx hippos	**25**	**15**	**22**	**4**	**.**	**.**	**.**	**66**
Caranx latus	.	1	1	1	.	.	.	3
Carcharhinus leucas	**.**	**1**	**.**	**1**	**.**	**.**	**.**	**2**
Centropomus undecimalis	**193**	**435**	**520**	**127**	**10**	**10**	**1**	**1,296**
Centropristis striata	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**

Species	Zone							Totals
	A	B	C	D	K	M	P	
	E=298	E=258	E=258	E=164	E=36	E=54	E=54	E=1,122
Chaetodipterus faber	30	121	53	6	5	1	8	224
Chasmodes saburrae	42	21	47	14	1	.	.	125
Chilomycterus schoepfii	44	127	84	130	.	1	.	386
Chloroscombrus chrysurus	.	2	3	1	.	.	.	6
Citharichthys macrops	.	.	.	3	.	.	.	3
Ctenogobius smaragdus	1	3	6	3	2	.	.	15
Cynoscion arenarius	**64**	**.**	**.**	**.**	**.**	**17**	**62**	**143**
Cynoscion nebulosus	**303**	**96**	**128**	**69**	**.**	**5**	**15**	**616**
Cyprinodon variegatus	259	666	63	366	2	1	.	1,357
Diapterus auratus	28	57	43	39	23	2	3	195
Diplectrum formosum	**.**	**9**	**2**	**20**	**.**	**.**	**.**	**31**
Elopiformes sp.	1	.	.	.	.	.	.	1
Elops saurus	**83**	**67**	**40**	**26**	**.**	**2**	**.**	**218**
Epinephelus itajara	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Epinephelus morio	**.**	**8**	**.**	**8**	**.**	**.**	**.**	**16**
Etropus crossotus	5	28	10	13	.	.	.	56
Eucinostomus gula	1,966	7,384	1,874	5,439	123	288	92	17,166
Eucinostomus harengulus	1,868	2,198	1,731	579	508	368	258	7,510
Eucinostomus spp.	9,731	18,630	9,249	12,409	3,172	1,054	474	54,719
Eugerres plumieri	1,875	247	326	3	85	187	61	2,784
Farfantepenaeus duorarum	**1,235**	**924**	**905**	**348**	**158**	**94**	**170**	**3,834**
Floridichthys carpio	4	385	97	646	15	.	.	1,147
Fundulus confluentus	1	7	4	14	.	.	1	27
Fundulus grandis	40	120	4	104	19	8	45	340
Fundulus similis	.	1	.	1	.	.	214	216
Fundulus xenicus	45	7	2	.	.	.	.	54
Gambusia holbrooki	41	12	727	1	21	111	490	1,403
Gobiesox strumosus	3	.	.	.	1	1	2	7
Gobiosoma bosc	21	1	2	.	.	14	6	44

Species	Zone							Totals
	A	B	C	D	K	M	P	
	E=298	E=258	E=258	E=164	E=36	E=54	E=54	E=1,122
Gobiosoma longipala	.	1	2	7	.	.	.	10
Gobiosoma robustum	117	228	173	167	36	3	2	726
Gobiosoma spp.	79	56	66	29	3	30	12	275
Gymnura lessae	.	.	1	.	.	.	.	1
Haemulon aurolineatum	**.**	**3**	**.**	**.**	**.**	**.**	**.**	**3**
Haemulon plumierii	**1**	**391**	**120**	**11**	**.**	**.**	**.**	**523**
Harengula jaguana	780	4,083	2,938	1,546	4	.	2	9,353
Hemiramphus brasiliensis	.	.	.	1	.	.	.	1
Hippocampus erectus	4	14	7	18	.	.	.	43
Hippocampus zosterae	4	18	2	36	1	.	.	61
Hypanus americanus	8	12	6	4	.	.	.	30
Hypanus sabinus	62	4	31	4	1	.	2	104
Hypanus say	12	1	7	1	.	.	.	21
Hypanus sp.	.	1	.	.	.	.	.	1
Hypleurochilus caudovittatus	.	1	.	.	.	.	.	1
Hyporhamphus meeki	.	2	3	2	.	.	.	7
Hyporhamphus spp.	1	.	1	.	.	.	.	2
Hyporhamphus unifasciatus	1	7	.	3	.	.	.	11
Hypsoblennius hentz	.	2	.	2	.	.	.	4
Lagodon rhomboides	668	15,140	3,641	14,672	2	1	.	34,124
Leiostomus xanthurus	**.**	**77**	**.**	**2**	**.**	**.**	**.**	**79**
Lepisosteus platyrhincus	3	.	1	.	.	.	.	4
Limulus polyphemus	7	1	5	.	.	.	.	13
Lophogobius cyprinoides	132	15	7	1	137	119	3	414
Lucania parva	1,438	12,666	3,778	7,604	201	24	1	25,712
Lupinoblennius nicholsi	.	.	1	.	1	.	1	3
Lutjanus analis	**.**	**2**	**.**	**.**	**.**	**.**	**.**	**2**
Lutjanus griseus	**68**	**89**	**69**	**87**	**2**	**16**	**15**	**346**
Lutjanus synagris	**4**	**206**	**141**	**85**	**.**	**.**	**.**	**436**

Species	Zone							Totals
	A	B	C	D	K	M	P	
	E=298	E=258	E=258	E=164	E=36	E=54	E=54	E=1,122
Mayaheros urophthalmus	60	1	.	.	2	28	9	100
Megalops atlanticus	**.**	**.**	**.**	**4**	**.**	**.**	**.**	**4**
Membras martinica	50	.	.	.	.	223	.	273
Menidia spp.	2,574	2,557	964	1,679	451	705	859	9,789
***Menippe* spp.**	**1**	**44**	**2**	**23**	**.**	**.**	**.**	**70**
Menticirrhus americanus	**118**	**.**	**2**	**9**	**.**	**65**	**77**	**271**
Menticirrhus saxatilis	**6**	**6**	**1**	**5**	**.**	**2**	**.**	**20**
Microgobius gulosus	1,525	813	747	176	102	114	99	3,576
Microgobius microlepis	.	1	.	1	.	.	.	2
Microgobius thalassinus	2	1	.	.	.	.	.	3
Monacanthus ciliatus	.	21	1	11	.	.	.	33
Mugil cephalus	**28**	**55**	**41**	**20**	**.**	**.**	**.**	**144**
Mugil curema	**2**	**34**	**4**	**31**	**1**	**.**	**.**	**72**
Mugil trichodon	**4**	**69**	**20**	**65**	**.**	**.**	**1**	**159**
Mycteroperca bonaci	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Mycteroperca microlepis	**.**	**73**	**10**	**14**	**.**	**.**	**.**	**97**
Myrophis punctatus	.	1	1	.	.	.	.	2
Negaprion brevirostris	**1**	**.**	**.**	**1**	**.**	**.**	**.**	**2**
Nicholsina usta	.	11	3	1	.	.	.	15
Ocyurus chrysurus	**.**	**18**	**2**	**.**	**.**	**.**	**.**	**20**
Ogcocephalus cubifrons	.	1	1	1	.	.	.	3
Oligoplites saurus	89	44	58	44	17	11	3	266
Opisthonema oglinum	.	76	1,463	359	2,496	1	.	4,395
Opsanus beta	21	76	11	108	.	2	4	222
Sarotherodon spp.	.	.	3	.	1	.	.	4
Orthopristis chrysoptera	3	171	24	27	.	.	.	225
Paralichthys albigutta	**.**	**12**	**10**	**3**	**.**	**.**	**.**	**25**
Poecilia latipinna	704	133	313	257	55	42	58	1,562
Pogonias cromis	**1**	**.**	**4**	**.**	**.**	**.**	**.**	**5**

Species	Zone							Totals
	A	B	C	D	K	M	P	
	E=298	E=258	E=258	E=164	E=36	E=54	E=54	E=1,122
Pomatomus saltatrix	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Portunus spp.	54	623	588	919	.	.	.	2,184
Prionotus rubio	.	5	1	.	.	.	.	6
Prionotus scitulus	64	130	109	33	.	4	7	347
Prionotus tribulus	25	5	7	5	.	.	3	45
Rhinoptera bonasus	31	.	.	.	.	.	1	32
Rimapenaeus constrictus	2	1	7	.	.	.	.	10
Rimapenaeus spp.	5	1	3	.	.	.	.	9
Sarotherodon melanotheron	.	.	6	.	1	.	.	7
Sciaenops ocellatus	**502**	**117**	**304**	**70**	**13**	**8**	**23**	**1,037**
Scorpaena brasiliensis	.	.	.	1	.	.	.	1
Selene vomer	1	.	.	.	.	.	.	1
Serraniculus pumilio	.	1	2	5	.	.	.	8
Serranus subligarius	.	1	.	1	.	.	.	2
Sicyonia laevigata	.	1	.	2	.	.	.	3
Sicyonia typica	1	.	.	1	.	.	.	2
Sphoeroides nephelus	106	180	156	155	.	1	.	598
Sphoeroides spengleri	.	9	.	5	.	.	.	14
Sphyraena barracuda	**.**	**26**	**1**	**9**	**.**	**.**	**.**	**36**
Sphyraena borealis	.	.	.	2	.	.	.	2
Sphyrna tiburo	**2**	**2**	**3**	**.**	**.**	**.**	**.**	**7**
Stephanolepis hispida	3	42	18	32	.	.	.	95
Strongylura marina	5	3	9	45	1	1	2	66
Strongylura notata	301	341	344	90	152	20	8	1,256
Strongylura spp.	.	2	2	3	.	.	6	13
Strongylura timucu	4	4	9	7	6	.	1	31
Symphurus plagiusa	73	20	21	5	.	8	14	141
Syngnathus floridae	1	51	9	54	.	.	.	115
Syngnathus louisianae	24	32	15	18	.	3	3	95

Species	Zone							Totals
	A	B	C	D	K	M	P	
	E=298	E=258	E=258	E=164	E=36	E=54	E=54	E=1,122
Syngnathus scovelli	191	122	146	148	5	3	13	628
Synodus foetens	45	109	68	43	1	6	12	284
Trachinotus carolinus	**3**	**44**	**8**	**.**	**.**	**.**	**.**	**55**
Trachinotus falcatus	**1**	**72**	**48**	**19**	**.**	**.**	**.**	**140**
Trinectes maculatus	253	39	133	.	4	56	407	892
Tylosurus crocodilus	.	3	.	.	.	.	.	3
Urophycis floridana	.	.	1	1	.	.	.	2
Totals	**47,229**	**93,135**	**38,874**	**49,961**	**29,996**	**18,585**	**8,057**	**285,837**

Zones A–D were located in Charlotte Harbor, while Zones K (Alligator Creek), M (Myakka River) and P (Peace River) were tributaries of Charlotte Harbor. Effort, or the total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

A.8 Northeast Florida

Table A.22: Monthly summary of taxa collected during northeast Florida stratified-random sampling, 2023.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
Achirus lineatus	5	2	4	12	3	3	2	5	2	3	1	5	47
***Albula* spp.**	**.**	**.**	**1**	**3**	**1**	**1**	**.**	**.**	**.**	**1**	**.**	**.**	**7**
Alosa aestivalis	.	.	.	.	1	.	.	62	.	.	.	.	63
Alosa mediocris	4	.	.	45	.	.	.	.	.	.	.	.	49
Alosa sapidissima	.	.	.	9	6	11	.	.	1	.	1	5	33
Alosa sp.	1	.	.	.	.	.	.	.	.	.	.	.	1
Ameiurus catus	98	46	97	18	11	9	15	19	26	37	41	48	465
Ameiurus nebulosus	.	.	.	.	.	.	.	.	.	2	.	.	2
Anchoa hepsetus	5	11	4	545	2,839	6,066	891	1,610	4,588	27	260	2	16,848
Anchoa lyolepis	.	.	.	.	303	153	30	6	384	1	2	.	879
Anchoa mitchilli	4,560	1,160	1,059	508	3,508	3,075	2,882	1,094	1,704	2,836	7,324	2,395	32,105
Anchoa spp.	.	.	.	1	.	.	.	1	.	.	.	.	2
Ancylopsetta quadrocellata	4	3	8	8	1	.	.	.	.	.	.	1	25
Anguilla rostrata	1	.	.	.	1	.	.	.	.	.	1	.	3
Archosargus probatocephalus	**4**	**11**	**1**	**16**	**6**	**3**	**11**	**24**	**13**	**16**	**2**	**6**	**113**
Ariopsis felis	20	28	4	16	31	2	26	36	15	72	55	2	307
Astroscopus y-graecum	4	3	.	1	.	.	.	1	.	.	1	1	11

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
Bagre marinus	.	.	.	.	16	1	24	25	10	1	.	.	77
Bairdiella chrysoura	116	25	59	409	244	425	103	41	64	35	37	80	1,638
Bathygobius soporator	1	8	1	4	6	7	16	3	11	4	4	14	79
***Brevoortia* spp.**	**1**	**60**	**3**	**749**	**2**	**6**	**71**	**5**	**10**	**11**	**.**	**7**	**925**
Callinectes ornatus	.	.	.	.	.	.	4	.	.	.	.	.	4
Callinectes sapidus	**274**	**137**	**107**	**106**	**86**	**224**	**129**	**91**	**84**	**133**	**73**	**135**	**1,579**
Callinectes similis	12	13	28	264	247	132	37	67	36	96	48	25	1,005
Callinectes spp.	.	.	.	.	.	3	.	.	.	.	.	.	3
Caranx crysos	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**
Caranx hippos	**.**	**.**	**.**	**1**	**4**	**9**	**7**	**40**	**3**	**7**	**5**	**4**	**80**
Carcharhinus isodon	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**1**
Centropomus parallelus	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**2**
Centropomus undecimalis	**10**	**.**	**2**	**.**	**2**	**.**	**.**	**1**	**2**	**5**	**8**	**8**	**38**
Centropristis philadelphica	**2**	**.**	**8**	**13**	**5**	**2**	**3**	**4**	**1**	**9**	**1**	**4**	**52**
Centropristis striata	**.**	**.**	**2**	**.**	**1**	**1**	**1**	**4**	**.**	**.**	**.**	**1**	**10**
Chaetodipterus faber	.	.	.	1	4	2	95	91	33	18	2	1	247
Charybdis hellerii	1	.	.	1	2	.	.	1	.	.	.	.	5
Chasmodes bosquianus	.	.	.	.	.	.	.	.	.	.	1	.	1
Chilomycterus schoepfii	1	.	4	1	1	3	4	1	3	9	1	6	34
Chloroscombrus chrysurus	.	.	.	.	7	.	7	23	19	49	54	.	159

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
Citharichthys macrops	1	.	1	1	.	.	1	.	.	.	.	.	4
Citharichthys spilopterus	12	12	35	73	94	96	42	102	50	18	10	13	557
Clupeiformes sp.	.	.	.	1	.	.	.	.	.	.	.	.	1
Ctenogobius boleosoma	36	35	12	41	29	22	19	11	6	45	15	136	407
Ctenogobius pseudofasciatus	.	.	.	.	.	.	.	.	.	.	.	1	1
Ctenogobius shufeldti	57	65	25	45	5	43	62	130	96	65	101	182	876
Ctenogobius smaragdus	2	1	.	5	.	8	2	15	2	9	16	17	77
Ctenogobius stigmaticus	.	.	.	1	10	.	2	.	.	3	5	.	21
Cynoscion complex	**42**	**24**	**21**	**7**	**71**	**249**	**135**	**69**	**173**	**121**	**60**	**26**	**998**
Cynoscion nebulosus	**11**	**8**	**2**	**13**	**9**	**10**	**13**	**58**	**18**	**25**	**19**	**18**	**204**
Cynoscion nothus	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**7**	**2**	**.**	**9**
Cyprinodon variegatus	2	1	.	1	.	.	.	288	.	.	.	38	330
Diapterus auratus	1	.	.	.	.	3	6	14	27	49	48	55	203
Diplectrum sp.	.	.	.	.	.	1	.	.	.	.	.	.	1
Dorosoma cepedianum	19	2	.	2	2	.	61	1	3	5	.	11	106
Dorosoma petenense	551	14	6	2	1	3	4	1	2	2	6	36	628
Eleotris amblyopsis	.	.	.	.	.	.	.	.	.	1	.	.	1
Elopiformes spp.	.	.	1	.	2	.	.	.	.	.	.	.	3
Elops saurus	**.**	**11**	**19**	**203**	**34**	**4**	**29**	**884**	**21**	**45**	**6**	**.**	**1,256**
Etheostoma fusiforme	.	1	.	.	.	.	.	.	.	.	2	.	3

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
Etropus crossotus	19	13	29	18	13	10	34	78	119	67	87	66	553
Etropus sp.	.	.	.	1	.	.	.	.	.	.	.	.	1
Eucinostomus gula	7	4	.	8	14	2	8	2	16	56	40	33	190
Eucinostomus harengulus	56	7	3	23	38	46	108	94	192	282	205	141	1,195
Eucinostomus spp.	13	1	.	.	47	20	29	370	690	1,159	1,026	422	3,777
Farfantepenaeus aztecus	**1**	**1**	**15**	**46**	**126**	**349**	**5**	**7**	**.**	**3**	**.**	**.**	**553**
Farfantepenaeus duorarum	**2**	**5**	**13**	**6**	**1**	**5**	**.**	**.**	**.**	**.**	**1**	**.**	**33**
***Farfantepenaeus* spp.**	**33**	**1**	**55**	**726**	**386**	**467**	**31**	**50**	**64**	**92**	**28**	**29**	**1,962**
Fundulus confluentus	2	2	.	.	.	.	.	.	.	.	.	.	4
Fundulus heteroclitus	478	302	49	36	166	14	630	4,700	19	36	33	994	7,457
Fundulus majalis	.	.	16	1	11	8	2	64	20	.	5	1	128
Fundulus seminolis	14	200	49	13	14	1	59	14	33	.	16	51	464
Gambusia holbrooki	4	36	84	20	93	1	1	23	.	.	3	10	275
Gobiesox strumosus	.	.	.	.	.	1	.	.	.	1	1	1	4
Gobioides broussonnetii	1	.	5	4	2	4	5	3	3	1	.	2	30
Gobionellus oceanicus	4	2	14	30	11	9	1	9	1	16	19	27	143
Gobiosoma bosc	4	7	10	9	12	6	4	4	3	2	4	6	71
Gobiosoma robustum	.	1	2	.	.	.	.	.	.	.	.	.	3
Gobiosoma spp.	4	11	.	1	3	5	.	6	19	10	22	26	107
Gymnura lessae	.	.	1	5	1	2	4	1	1	3	2	1	21

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
Harengula jaguana	.	1	.	1	8	78	1	1	70	37	222	4	423
Heterandria formosa	1	.	.	.	.	.	.	.	.	.	.	.	1
Hypanus sabinus	39	27	30	53	60	25	34	49	22	58	34	36	467
Hypanus say	.	.	2	1	.	1	2	3	3	3	.	.	15
Hypleurochilus geminatus	.	.	.	.	.	.	.	2	.	.	.	1	3
Hypsoblennius hentz	.	.	1	.	.	.	.	2	.	.	.	1	4
Hypsoblennius ionthas	.	1	1	.	1	1	.	.	.	.	.	.	4
Ictalurus punctatus	38	13	38	3	2	.	2	15	40	36	13	25	225
Labidesthes vanhyningi	26	5	212	22	13	3	2	4	.	12	10	.	309
Labrisomus nuchipinnis	.	.	.	.	.	.	.	1	.	.	.	.	1
Lagodon rhomboides	.	1	4	37	29	45	87	62	59	58	19	9	410
Larimus fasciatus	1	.	.	.	.	.	.	9	.	3	.	.	13
Leiostomus xanthurus	**68**	**13,458**	**469**	**685**	**730**	**134**	**200**	**104**	**64**	**208**	**54**	**121**	**16,295**
Lepisosteus osseus	.	.	2	1	3	2	5	3	17	12	6	9	60
Lepisosteus platyrhincus	.	1	1	.	.	.	5	2	1	1	1	.	12
Lepomis auritus	6	13	14	29	24	13	6	7	27	5	5	14	163
Lepomis gulosus	1	.	.	.	.	.	.	.	.	.	.	.	1
Lepomis macrochirus	17	74	110	98	132	11	11	33	18	11	62	40	617
Lepomis microlophus	.	1	5	1	6	9	3	8	1	14	5	7	60
Lepomis punctatus	1	.	.	.	.	.	.	.	.	.	.	.	1

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
Lepomis spp.	.	.	.	.	1	.	8	6	10	5	5	2	37
Limulus polyphemus	4	1	.	1	.	.	.	.	.	1	.	.	7
Litopenaeus setiferus	**133**	**432**	**59**	**66**	**84**	**282**	**2,049**	**5,587**	**3,450**	**1,070**	**1,281**	**663**	**15,156**
Lobotes surinamensis	**.**	**.**	**.**	**.**	**2**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**2**
Loricariidae sp.	.	.	.	.	.	.	.	.	.	.	1	.	1
Lucania goodei	.	.	.	2	.	.	.	.	.	.	.	.	2
Lucania parva	2	105	.	.	2	1	.	.	6	.	.	.	116
Lutjanus analis	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**1**
Lutjanus griseus	**.**	**.**	**.**	**.**	**1**	**.**	**4**	**6**	**10**	**9**	**1**	**3**	**34**
Lutjanus synagris	**.**	**.**	**.**	**.**	**.**	**.**	**5**	**3**	**5**	**12**	**.**	**5**	**30**
Megalops atlanticus	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**1**	**1**	**.**	**3**
Membras martinica	8	6	1	.	.	3	22	13	3	2	6	.	64
Menidia menidia	166	429	304	49	539	763	1,175	5,775	786	329	230	430	10,975
Menidia spp.	473	698	238	192	349	247	328	494	193	469	853	592	5,126
***Menippe* spp.**	**2**	**.**	**.**	**1**	**.**	**1**	**.**	**2**	**.**	**.**	**.**	**.**	**6**
Menticirrhus americanus	**10**	**.**	**.**	**8**	**17**	**42**	**23**	**147**	**33**	**36**	**10**	**5**	**331**
Menticirrhus littoralis	**.**	**.**	**.**	**.**	**.**	**4**	**.**	**.**	**.**	**.**	**.**	**1**	**5**
Menticirrhus saxatilis	**.**	**.**	**.**	**3**	**1**	**3**	**.**	**.**	**.**	**.**	**.**	**.**	**7**
Menticirrhus sp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Microgobius gulosus	13	37	13	6	11	10	10	33	86	70	65	82	436

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
Microgobius thalassinus	15	2	.	1	.	8	23	1	7	65	20	4	146
Microphis lineatus	.	.	.	.	1	.	.	.	.	.	.	1	2
Micropogonias undulatus	**787**	**1,545**	**4,049**	**1,629**	**1,003**	**447**	**121**	**185**	**27**	**634**	**1,389**	**981**	**12,797**
Micropterus salmoides	1	3	4	4	94	5	7	11	3	2	1	2	137
Morone saxatilis	.	.	1	.	4	1	2	.	.	.	.	.	8
Mugil cephalus	**116**	**1,619**	**118**	**181**	**171**	**147**	**265**	**328**	**81**	**65**	**69**	**190**	**3,350**
Mugil curema	**4**	**13**	**34**	**46**	**249**	**57**	**195**	**125**	**107**	**444**	**101**	**713**	**2,088**
Myrophis punctatus	.	.	2	.	.	1	1	1	1	3	1	1	11
Notemigonus crysoleucas	.	.	.	2	3	.	3	.	3	1	1	.	13
Notropis maculatus	.	.	.	2	.	.	.	.	.	.	.	.	2
Ogcocephalus cubifrons	.	2	.	.	.	.	.	.	.	.	.	.	2
Oligoplites saurus	.	.	.	.	.	2	18	14	25	27	5	4	95
Ophichthus gomesii	.	.	.	.	.	1	.	1	.	.	.	.	2
Ophidion holbrookii	1	.	.	.	.	.	.	.	.	.	.	.	1
Opisthonema oglinum	.	8	1	6	343	364	77	339	767	2	2	.	1,909
Opsanus tau	.	1	3	.	1	1	2	1	2	2	1	2	16
Oreochromis complex	.	.	1	1	1	.	1	.	.	.	.	.	4
Sarotherodon spp.	.	.	.	1	.	.	.	3	.	.	.	.	4
Orthopristis chrysoptera	.	.	.	78	33	56	9	8	5	10	.	3	202
Paralichthys albigutta	**2**	**.**	**8**	**27**	**9**	**9**	**4**	**3**	**5**	**1**	**2**	**1**	**71**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
Paralichthys dentatus	**1**	**.**	**5**	**.**	**1**	**1**	**.**	**.**	**1**	**.**	**1**	**.**	**10**
Paralichthys lethostigma	**6**	**9**	**11**	**7**	**12**	**4**	**8**	**15**	**11**	**10**	**5**	**8**	**106**
Penaeus monodon	.	.	.	.	.	.	1	1	.	.	.	.	2
Peprilus paru	.	.	3	.	.	.	.	1	.	1	.	.	5
Peprilus spp.	.	.	.	5	.	.	.	.	.	.	.	.	5
Peprilus triacanthus	1	3	1	1	1	.	.	.	.	.	.	.	7
Poecilia latipinna	2	4	5	.	.	.	.	2,340	.	1	1	5	2,358
Pogonias cromis	**1**	**6**	**2**	**.**	**.**	**.**	**5**	**2**	**.**	**4**	**3**	**6**	**29**
Pomatomus saltatrix	**.**	**2**	**.**	**2**	**1**	**.**	**4**	**.**	**.**	**.**	**1**	**3**	**13**
Pomoxis nigromaculatus	21	11	6	10	1	4	9	.	.	2	2	1	67
Portunus spp.	5	1	14	48	5	12	5	1	.	6	.	.	97
Prionotus carolinus	.	.	1	1	1	.	.	.	.	.	.	.	3
Prionotus evolans	2	5	10	12	10	6	3	.	.	.	.	.	48
Prionotus rubio	.	.	.	2	.	.	.	.	.	.	.	.	2
Prionotus scitulus	2	.	2	10	1	2	2	2	2	.	1	.	24
Prionotus sp.	.	.	.	1	.	.	.	.	.	.	.	.	1
Prionotus tribulus	10	2	13	14	8	11	1	.	.	1	5	4	69
Rhinoptera bonasus	.	.	.	.	.	.	1	.	.	.	.	.	1
Rhizoprionodon terraenovae	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**.**	**.**	**.**	**.**	**.**	**2**
Rimapenaeus constrictus	4	.	15	.	.	5	.	.	.	.	2	.	26

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
Rimapenaeus spp.	27	1	6	13	1	16	1	7	11	281	74	.	438
Sciaenidae spp.	.	.	.	1	5	.	.	.	1	.	.	.	7
Sciaenops ocellatus	**8**	**19**	**7**	**15**	**6**	**13**	**20**	**14**	**8**	**48**	**99**	**23**	**280**
Scomberomorus maculatus	**.**	**.**	**1**	**.**	**2**	**1**	**3**	**1**	**.**	**.**	**.**	**.**	**8**
Selene vomer	.	.	.	.	.	2	2	2	.	81	4	5	96
Serraniculus pumilio	1	.	.	.	.	.	.	.	.	.	.	.	1
Sicyonia brevirostris	1	.	.	1	.	.	.	.	.	.	.	.	2
Sicyonia dorsalis	1	1	.	2	.	.	.	.	.	1	.	.	5
Sphoeroides nephelus	1	2	1	7	9	13	1	3	2	3	2	1	45
Sphoeroides spengleri	.	.	.	.	.	.	.	1	.	.	.	.	1
Sphoeroides sp.	.	.	.	1	.	.	.	.	.	.	.	.	1
Sphyraena barracuda	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**2**	**2**	**.**	**6**
Sphyraena guachancho	.	.	.	.	.	.	.	.	1	.	.	.	1
Sphyrna lewini	.	.	.	.	.	1	.	.	.	.	.	.	1
Sphyrna tiburo	**.**	**.**	**1**	**1**	**3**	**2**	**8**	**.**	**.**	**6**	**.**	**.**	**21**
Stellifer lanceolatus	142	.	4	.	20	172	49	6	694	60	33	39	1,219
Stephanolepis hispida	.	.	1	1	5	3	1	.	.	4	1	.	16
Stomolophus meleagris	2	3	.	.	1	.	.	.	.	6	1	3	16
Strongylura marina	.	3	3	1	14	3	7	12	36	31	9	4	123
Strongylura notata	.	.	.	1	.	.	.	.	.	.	.	.	1

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=113	E=1,356
Strongylura spp.	.	.	9	20	10	11	4	3	.	1	1	1	60
Symphurus civitatum	1	.	5	1	.	1	.	1	.	.	3	.	12
Symphurus plagiusa	42	16	18	29	34	27	26	71	19	72	42	14	410
Symphurus sp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Syngnathus fuscus	1	.	1	3	1	1	.	.	.	.	.	.	7
Syngnathus louisianae	.	1	2	3	6	5	2	2	.	4	3	2	30
Syngnathus scovelli	4	1	1	1	5	5	4	.	.	2	3	1	27
Synodus foetens	.	.	.	2	5	3	10	2	1	.	.	2	25
Trachinotus carolinus	**.**	**.**	**.**	**.**	**23**	**20**	**5**	**11**	**7**	**1**	**2**	**.**	**69**
Trachinotus falcatus	**.**	**.**	**.**	**.**	**2**	**5**	**.**	**4**	**5**	**.**	**1**	**5**	**22**
Trichiurus lepturus	.	.	.	2	10	4	3	.	.	.	.	.	19
Trinectes maculatus	233	65	64	22	14	18	51	118	25	91	56	75	832
Tylosurus crocodilus	.	.	.	.	.	.	.	8	1	.	.	.	9
Unidentified species	.	.	.	.	.	1	.	.	.	.	.	.	1
Urophycis floridana	.	1	4	.	.	.	.	.	.	.	.	.	5
Xiphopenaeus kroyeri	.	.	1	.	.	.	.	.	3	.	.	.	4
Totals	**8,954**	**20,927**	**7,801**	**7,550**	**12,679**	**14,678**	**10,601**	**26,273**	**15,354**	**9,933**	**14,537**	**9,250**	**158,537**

Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.23: Summary by gear and stratum of taxa collected during northeast Florida stratified-random sampling, 2023.

Species	Gear			Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	E=576	E=192	E=588	E=1,356
Achirus lineatus	10	7	30	47
***Albula* spp.**	**2**	**1**	**4**	**7**
Alosa aestivalis	62	.	1	63
Alosa mediocris	48	.	1	49
Alosa sapidissima	30	.	3	33
Alosa sp.	1	.	.	1
Ameiurus catus	3	18	444	465
Ameiurus nebulosus	.	.	2	2
Anchoa hepsetus	15,893	.	955	16,848
Anchoa lyolepis	780	.	99	879
Anchoa mitchilli	23,715	.	8,390	32,105
Anchoa spp.	.	.	2	2
Ancylopsetta quadrocellata	3	6	16	25
Anguilla rostrata	.	.	3	3
Archosargus probatocephalus	**13**	**75**	**25**	**113**
Ariopsis felis	5	80	222	307
Astroscopus y-graecum	4	3	4	11
Bagre marinus	.	.	77	77
Bairdiella chrysoura	1,066	134	438	1,638
Bathygobius soporator	67	.	12	79
***Brevoortia* spp.**	**670**	**237**	**18**	**925**
Callinectes ornatus	.	.	4	4
Callinectes sapidus	**357**	**61**	**1,161**	**1,579**
Callinectes similis	345	39	621	1,005
Callinectes spp.	.	.	3	3
Caranx crysos	**.**	**1**	**.**	**1**

Species	Gear			Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	E=576	E=192	E=588	E=1,356
Caranx hippos	**15**	**64**	**1**	**80**
Carcharhinus isodon	**.**	**1**	**.**	**1**
Centropomus parallelus	**2**	**.**	**.**	**2**
Centropomus undecimalis	**36**	**2**	**.**	**38**
Centropristis philadelphica	**3**	**.**	**49**	**52**
Centropristis striata	**.**	**.**	**10**	**10**
Chaetodipterus faber	47	81	119	247
Charybdis hellerii	.	.	5	5
Chasmodes bosquianus	1	.	.	1
Chilomycterus schoepfii	5	20	9	34
Chloroscombrus chrysurus	5	66	88	159
Citharichthys macrops	.	.	4	4
Citharichthys spilopterus	154	56	347	557
Clupeiformes sp.	.	.	1	1
Ctenogobius boleosoma	378	.	29	407
Ctenogobius pseudofasciatus	1	.	.	1
Ctenogobius shufeldti	493	.	383	876
Ctenogobius smaragdus	57	.	20	77
Ctenogobius stigmaticus	7	.	14	21
Cynoscion complex	**12**	**14**	**972**	**998**
Cynoscion nebulosus	**129**	**59**	**16**	**204**
Cynoscion nothus	**.**	**.**	**9**	**9**
Cyprinodon variegatus	330	.	.	330
Diapterus auratus	109	37	57	203
Diplectrum sp.	.	.	1	1
Dorosoma cepedianum	7	96	3	106
Dorosoma petenense	556	38	34	628
Eleotris amblyopsis	1	.	.	1

Species	Gear			Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	E=576	E=192	E=588	E=1,356
Elopiformes spp.	.	.	3	3
Elops saurus	**44**	**976**	**236**	**1,256**
Etheostoma fusiforme	3	.	.	3
Etropus crossotus	75	19	459	553
Etropus sp.	.	.	1	1
Eucinostomus gula	118	51	21	190
Eucinostomus harengulus	1,014	108	73	1,195
Eucinostomus spp.	3,684	.	93	3,777
Farfantepenaeus aztecus	**125**	**3**	**425**	**553**
Farfantepenaeus duorarum	**.**	**.**	**33**	**33**
***Farfantepenaeus* spp.**	**1,105**	**15**	**842**	**1,962**
Fundulus confluentus	4	.	.	4
Fundulus heteroclitus	7,457	.	.	7,457
Fundulus majalis	128	.	.	128
Fundulus seminolis	464	.	.	464
Gambusia holbrooki	275	.	.	275
Gobiesox strumosus	3	.	1	4
Gobioides broussonnetii	.	.	30	30
Gobionellus oceanicus	18	.	125	143
Gobiosoma bosc	60	.	11	71
Gobiosoma robustum	1	.	2	3
Gobiosoma spp.	92	.	15	107
Gymnura lessae	.	4	17	21
Harengula jaguana	413	7	3	423
Heterandria formosa	1	.	.	1
Hypanus sabinus	27	247	193	467
Hypanus say	.	11	4	15
Hypleurochilus geminatus	.	.	3	3

Species	Gear			Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	E=576	E=192	E=588	E=1,356
Hypsoblennius hentz	3	.	1	4
Hypsoblennius ionthas	.	.	4	4
Ictalurus punctatus	3	10	212	225
Labidesthes vanhyningi	309	.	.	309
Labrisomus nuchipinnis	1	.	.	1
Lagodon rhomboides	140	257	13	410
Larimus fasciatus	.	.	13	13
Leiostomus xanthurus	**14,788**	**521**	**986**	**16,295**
Lepisosteus osseus	3	53	4	60
Lepisosteus platyrhincus	10	2	.	12
Lepomis auritus	149	1	13	163
Lepomis gulosus	.	.	1	1
Lepomis macrochirus	574	20	23	617
Lepomis microlophus	27	16	17	60
Lepomis punctatus	.	.	1	1
Lepomis spp.	34	.	3	37
Limulus polyphemus	.	.	7	7
Litopenaeus setiferus	**8,198**	**252**	**6,706**	**15,156**
Lobotes surinamensis	**.**	**2**	**.**	**2**
Loricariidae sp.	.	.	1	1
Lucania goodei	2	.	.	2
Lucania parva	116	.	.	116
Lutjanus analis	**.**	**.**	**1**	**1**
Lutjanus griseus	**22**	**5**	**7**	**34**
Lutjanus synagris	**12**	**3**	**15**	**30**
Megalops atlanticus	**.**	**3**	**.**	**3**
Membras martinica	64	.	.	64
Menidia menidia	10,975	.	.	10,975

Species	Gear			Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	E=576	E=192	E=588	E=1,356
Menidia spp.	5,125	.	1	5,126
***Menippe* spp.**	**.**	**.**	**6**	**6**
Menticirrhus americanus	**121**	**12**	**198**	**331**
Menticirrhus littoralis	**5**	**.**	**.**	**5**
Menticirrhus saxatilis	**4**	**.**	**3**	**7**
Menticirrhus sp.	.	.	1	1
Microgobius gulosus	230	.	206	436
Microgobius thalassinus	5	.	141	146
Microphis lineatus	2	.	.	2
Micropogonias undulatus	**841**	**51**	**11,905**	**12,797**
Micropterus salmoides	120	13	4	137
Morone saxatilis	6	.	2	8
Mugil cephalus	**1,792**	**1,558**	**.**	**3,350**
Mugil curema	**500**	**1,588**	**.**	**2,088**
Myrophis punctatus	3	.	8	11
Notemigonus crysoleucas	13	.	.	13
Notropis maculatus	.	.	2	2
Ogcocephalus cubifrons	.	1	1	2
Oligoplites saurus	89	6	.	95
Ophichthus gomesii	.	.	2	2
Ophidion holbrookii	.	.	1	1
Opisthonema oglinum	1,866	7	36	1,909
Opsanus tau	.	.	16	16
Oreochromis complex	2	1	1	4
Sarotherodon spp.	3	.	1	4
Orthopristis chrysoptera	153	11	38	202
Paralichthys albigutta	**33**	**12**	**26**	**71**
Paralichthys dentatus	**3**	**2**	**5**	**10**

Species	Gear			Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	E=576	E=192	E=588	E=1,356
Paralichthys lethostigma	**22**	**21**	**63**	**106**
Penaeus monodon	.	.	2	2
Peprilus paru	1	.	4	5
Peprilus spp.	5	.	.	5
Peprilus triacanthus	.	.	7	7
Poecilia latipinna	2,358	.	.	2,358
Pogonias cromis	**4**	**25**	**.**	**29**
Pomatomus saltatrix	**3**	**10**	**.**	**13**
Pomoxis nigromaculatus	11	.	56	67
Portunus spp.	24	.	73	97
Prionotus carolinus	.	1	2	3
Prionotus evolans	5	5	38	48
Prionotus rubio	.	.	2	2
Prionotus scitulus	1	.	23	24
Prionotus sp.	.	.	1	1
Prionotus tribulus	11	10	48	69
Rhinoptera bonasus	.	1	.	1
Rhizoprionodon terraenovae	**.**	**2**	**.**	**2**
Rimapenaeus constrictus	.	.	26	26
Rimapenaeus spp.	5	.	433	438
Sciaenidae spp.	1	.	6	7
Sciaenops ocellatus	**185**	**88**	**7**	**280**
Scomberomorus maculatus	**2**	**5**	**1**	**8**
Selene vomer	1	15	80	96
Serraniculus pumilio	.	.	1	1
Sicyonia brevirostris	.	.	2	2
Sicyonia dorsalis	.	.	5	5
Sphoeroides nephelus	18	5	22	45

Species	Gear			Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	E=576	E=192	E=588	E=1,356
Sphoeroides spengleri	.	.	1	1
Sphoeroides sp.	1	.	.	1
Sphyraena barracuda	**4**	**2**	**.**	**6**
Sphyraena guachancho	.	.	1	1
Sphyrna lewini	.	1	.	1
Sphyrna tiburo	**.**	**20**	**1**	**21**
Stellifer lanceolatus	.	.	1,219	1,219
Stephanolepis hispida	10	.	6	16
Stomolophus meleagris	.	8	8	16
Strongylura marina	29	94	.	123
Strongylura notata	.	1	.	1
Strongylura spp.	60	.	.	60
Symphurus civitatum	.	.	12	12
Symphurus plagiusa	170	2	238	410
Symphurus sp.	.	.	1	1
Syngnathus fuscus	1	.	6	7
Syngnathus louisianae	17	.	13	30
Syngnathus scovelli	22	.	5	27
Synodus foetens	14	4	7	25
Trachinotus carolinus	**68**	**1**	**.**	**69**
Trachinotus falcatus	**9**	**13**	**.**	**22**
Trichiurus lepturus	.	4	15	19
Trinectes maculatus	54	15	763	832
Tylosurus crocodilus	1	8	.	9
Unidentified species	1	.	.	1
Urophycis floridana	.	.	5	5
Xiphopenaeus kroyeri	.	.	4	4
Totals	**109,997**	**7,405**	**41,135**	**158,537**

Species	Gear			Totals
	21.3-m river seine	183-m haul seine	6.1-m otter trawl	
	E=576	E=192	E=588	E=1,356

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, 183-m haul seine, and 6.1-m otter trawl was not stratified. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.24: Summary by zone of taxa collected during northeast Florida stratified-random sampling, 2023.

Species	Zone						Totals
	A	B	C	D	E	F	
	E=204	E=204	E=276	E=288	E=192	E=192	E=1,356
Achirus lineatus	12	11	7	16	1	.	47
***Albula* spp.**	**.**	**.**	**7**	**.**	**.**	**.**	**7**
Alosa aestivalis	62	.	.	1	.	.	63
Alosa mediocris	.	.	.	.	.	49	49
Alosa sapidissima	.	10	.	2	5	16	33
Alosa sp.	.	.	.	1	.	.	1
Ameiurus catus	8	4	.	50	95	308	465
Ameiurus nebulosus	.	.	.	.	.	2	2
Anchoa hepsetus	6,730	7,471	2,275	179	172	21	16,848
Anchoa lyolepis	420	429	11	19	.	.	879
Anchoa mitchilli	4,707	7,634	5,502	6,401	2,254	5,607	32,105
Anchoa spp.	.	2	.	.	.	.	2
Ancylopsetta quadrocellata	17	6	2	.	.	.	25
Anguilla rostrata	.	.	.	2	1	.	3
Archosargus probatocephalus	**14**	**7**	**69**	**23**	**.**	**.**	**113**
Ariopsis felis	82	72	102	47	3	1	307
Astroscopus y-graecum	5	2	4	.	.	.	11
Bagre marinus	45	23	1	6	2	.	77
Bairdiella chrysoura	182	712	153	545	39	7	1,638
Bathygobius soporator	14	24	35	6	.	.	79
***Brevoortia* spp.**	**644**	**12**	**159**	**69**	**41**	**.**	**925**
Callinectes ornatus	4	.	.	.	.	.	4
Callinectes sapidus	**147**	**342**	**443**	**376**	**139**	**132**	**1,579**
Callinectes similis	545	334	118	8	.	.	1,005
Callinectes spp.	.	3	.	.	.	.	3
Caranx crysos	**.**	**1**	**.**	**.**	**.**	**.**	**1**
Caranx hippos	**14**	**20**	**40**	**6**	**.**	**.**	**80**

Species	Zone						Totals
	A	B	C	D	E	F	
	E=204	E=204	E=276	E=288	E=192	E=192	E=1,356
Carcharhinus isodon	**.**	**1**	**.**	**.**	**.**	**.**	**1**
Centropomus parallelus	**.**	**1**	**1**	**.**	**.**	**.**	**2**
Centropomus undecimalis	**.**	**3**	**3**	**29**	**3**	**.**	**38**
Centropristis philadelphica	**24**	**12**	**16**	**.**	**.**	**.**	**52**
Centropristis striata	**5**	**3**	**2**	**.**	**.**	**.**	**10**
Chaetodipterus faber	59	137	49	2	.	.	247
Charybdis hellerii	2	1	2	.	.	.	5
Chasmodes bosquianus	1	.	.	.	.	.	1
Chilomycterus schoepfii	16	11	7	.	.	.	34
Chloroscombrus chrysurus	73	25	12	49	.	.	159
Citharichthys macrops	1	3	.	.	.	.	4
Citharichthys spilopterus	105	126	157	107	28	34	557
Clupeiformes sp.	.	.	.	.	1	.	1
Ctenogobius boleosoma	42	164	151	48	1	1	407
Ctenogobius pseudofasciatus	.	.	.	1	.	.	1
Ctenogobius shufeldti	27	4	45	401	172	227	876
Ctenogobius smaragdus	4	15	55	3	.	.	77
Ctenogobius stigmaticus	3	1	5	12	.	.	21
Cynoscion complex	**202**	**180**	**30**	**291**	**176**	**119**	**998**
Cynoscion nebulosus	**36**	**48**	**99**	**20**	**1**	**.**	**204**
Cynoscion nothus	**6**	**1**	**2**	**.**	**.**	**.**	**9**
Cyprinodon variegatus	1	328	1	.	.	.	330
Diapterus auratus	4	18	115	49	14	3	203
Diplectrum sp.	.	1	.	.	.	.	1
Dorosoma cepedianum	2	2	24	72	.	6	106
Dorosoma petenense	2	4	40	10	17	555	628
Eleotris amblyopsis	.	.	.	1	.	.	1
Elopiformes spp.	.	.	.	3	.	.	3
Elops saurus	**25**	**96**	**936**	**58**	**18**	**123**	**1,256**

Species	Zone						Totals
	A	B	C	D	E	F	
	E=204	E=204	E=276	E=288	E=192	E=192	E=1,356
Etheostoma fusiforme	.	.	.	3	.	.	3
Etropus crossotus	242	156	148	7	.	.	553
Etropus sp.	1	.	.	.	.	.	1
Eucinostomus gula	25	26	122	17	.	.	190
Eucinostomus harengulus	49	87	511	312	160	76	1,195
Eucinostomus spp.	33	687	2,170	521	217	149	3,777
Farfantepenaeus aztecus	**89**	**312**	**77**	**58**	**15**	**2**	**553**
Farfantepenaeus duorarum	**11**	**18**	**4**	**.**	**.**	**.**	**33**
***Farfantepenaeus* spp.**	**190**	**358**	**1,003**	**328**	**79**	**4**	**1,962**
Fundulus confluentus	3	1	.	.	.	.	4
Fundulus heteroclitus	1,360	5,489	608	.	.	.	7,457
Fundulus majalis	24	50	54	.	.	.	128
Fundulus seminolis	.	.	.	2	3	459	464
Gambusia holbrooki	3	18	14	151	.	89	275
Gobiesox strumosus	2	2	.	.	.	.	4
Gobioides broussonnetii	.	1	1	27	1	.	30
Gobionellus oceanicus	.	6	66	67	4	.	143
Gobiosoma bosc	.	2	23	16	16	14	71
Gobiosoma robustum	.	2	.	1	.	.	3
Gobiosoma spp.	5	1	9	19	29	44	107
Gymnura lessae	8	10	3	.	.	.	21
Harengula jaguana	68	74	225	55	1	.	423
Heterandria formosa	.	.	.	.	.	1	1
Hypanus sabinus	61	66	134	110	44	52	467
Hypanus say	3	4	8	.	.	.	15
Hypleurochilus geminatus	.	.	3	.	.	.	3
Hypsoblennius hentz	.	4	.	.	.	.	4
Hypsoblennius ionthas	.	2	2	.	.	.	4
Ictalurus punctatus	.	.	.	15	36	174	225

Species	Zone						Totals
	A	B	C	D	E	F	
	E=204	E=204	E=276	E=288	E=192	E=192	E=1,356
Labidesthes vanhyningi	.	.	.	251	29	29	309
Labrisomus nuchipinnis	.	1	.	.	.	.	1
Lagodon rhomboides	88	38	99	172	13	.	410
Larimus fasciatus	6	7	.	.	.	.	13
Leiostomus xanthurus	**11,939**	**772**	**2,680**	**791**	**99**	**14**	**16,295**
Lepisosteus osseus	11	9	2	37	.	1	60
Lepisosteus platyrhincus	.	.	2	2	5	3	12
Lepomis auritus	.	.	.	27	30	106	163
Lepomis gulosus	.	.	.	.	1	.	1
Lepomis macrochirus	.	.	.	178	71	368	617
Lepomis microlophus	.	.	.	41	9	10	60
Lepomis punctatus	.	.	.	.	1	.	1
Lepomis spp.	.	.	.	6	7	24	37
Limulus polyphemus	3	4	.	.	.	.	7
Litopenaeus setiferus	**2,483**	**5,318**	**3,297**	**1,741**	**717**	**1,600**	**15,156**
Lobotes surinamensis	**2**	**.**	**.**	**.**	**.**	**.**	**2**
Loricariidae sp.	.	.	.	1	.	.	1
Lucania goodei	.	.	.	2	.	.	2
Lucania parva	6	.	.	8	3	99	116
Lutjanus analis	**.**	**1**	**.**	**.**	**.**	**.**	**1**
Lutjanus griseus	**6**	**14**	**6**	**8**	**.**	**.**	**34**
Lutjanus synagris	**8**	**22**	**.**	**.**	**.**	**.**	**30**
Megalops atlanticus	**.**	**1**	**2**	**.**	**.**	**.**	**3**
Membras martinica	6	6	4	18	4	26	64
Menidia menidia	1,815	7,171	1,929	60	.	.	10,975
Menidia spp.	57	75	107	396	1,166	3,325	5,126
***Menippe* spp.**	**4**	**1**	**1**	**.**	**.**	**.**	**6**
Menticirrhus americanus	**113**	**159**	**55**	**3**	**1**	**.**	**331**
Menticirrhus littoralis	**1**	**.**	**4**	**.**	**.**	**.**	**5**

Species	Zone						Totals
	A	B	C	D	E	F	
	E=204	E=204	E=276	E=288	E=192	E=192	E=1,356
Menticirrhus saxatilis	**2**	**3**	**2**	**.**	**.**	**.**	**7**
Menticirrhus sp.	1	.	.	.	.	.	1
Microgobius gulosus	.	.	.	127	103	206	436
Microgobius thalassinus	1	.	106	38	1	.	146
Microphis lineatus	.	.	.	2	.	.	2
Micropogonias undulatus	**375**	**2,977**	**497**	**4,667**	**1,909**	**2,372**	**12,797**
Micropterus salmoides	.	.	.	122	4	11	137
Morone saxatilis	1	.	.	.	.	7	8
Mugil cephalus	**283**	**388**	**2,120**	**487**	**25**	**47**	**3,350**
Mugil curema	**135**	**421**	**1,303**	**178**	**29**	**22**	**2,088**
Myrophis punctatus	.	4	2	1	2	2	11
Notemigonus crysoleucas	.	.	.	3	2	8	13
Notropis maculatus	.	.	.	.	.	2	2
Ogcocephalus cubifrons	2	.	.	.	.	.	2
Oligoplites saurus	17	20	34	22	2	.	95
Ophichthus gomesii	1	.	1	.	.	.	2
Ophidion holbrookii	1	.	.	.	.	.	1
Opisthonema oglinum	838	835	160	75	1	.	1,909
Opsanus tau	4	6	4	2	.	.	16
Oreochromis complex	.	.	.	2	.	2	4
Sarotherodon spp.	.	.	.	.	3	1	4
Orthopristis chrysoptera	33	74	70	25	.	.	202
Paralichthys albigutta	**18**	**19**	**31**	**3**	**.**	**.**	**71**
Paralichthys dentatus	**3**	**6**	**1**	**.**	**.**	**.**	**10**
Paralichthys lethostigma	**20**	**17**	**15**	**26**	**18**	**10**	**106**
Penaeus monodon	.	.	1	1	.	.	2
Peprilus paru	4	.	.	1	.	.	5
Peprilus spp.	5	.	.	.	.	.	5
Peprilus triacanthus	1	4	2	.	.	.	7

Species	Zone						Totals
	A	B	C	D	E	F	
	E=204	E=204	E=276	E=288	E=192	E=192	E=1,356
Poecilia latipinna	3	2,344	5	1	.	5	2,358
Pogonias cromis	**5**	**8**	**16**	**.**	**.**	**.**	**29**
Pomatomus saltatrix	**9**	**1**	**3**	**.**	**.**	**.**	**13**
Pomoxis nigromaculatus	.	.	.	3	23	41	67
Portunus spp.	48	45	4	.	.	.	97
Prionotus carolinus	1	.	2	.	.	.	3
Prionotus evolans	30	11	7	.	.	.	48
Prionotus rubio	1	.	1	.	.	.	2
Prionotus scitulus	11	10	3	.	.	.	24
Prionotus sp.	.	.	.	.	1	.	1
Prionotus tribulus	27	20	22	.	.	.	69
Rhinoptera bonasus	1	.	.	.	.	.	1
Rhizoprionodon terraenovae	**2**	**.**	**.**	**.**	**.**	**.**	**2**
Rimapenaeus constrictus	7	19	.	.	.	.	26
Rimapenaeus spp.	41	384	13	.	.	.	438
Sciaenidae spp.	5	2	.	.	.	.	7
Sciaenops ocellatus	**5**	**14**	**158**	**67**	**21**	**15**	**280**
Scomberomorus maculatus	**.**	**6**	**2**	**.**	**.**	**.**	**8**
Selene vomer	80	1	14	1	.	.	96
Serraniculus pumilio	1	.	.	.	.	.	1
Sicyonia brevirostris	1	1	.	.	.	.	2
Sicyonia dorsalis	2	3	.	.	.	.	5
Sphoeroides nephelus	12	11	18	4	.	.	45
Sphoeroides spengleri	.	.	1	.	.	.	1
Sphoeroides sp.	.	1	.	.	.	.	1
Sphyraena barracuda	**1**	**1**	**4**	**.**	**.**	**.**	**6**
Sphyraena guachancho	.	.	1	.	.	.	1
Sphyrna lewini	1	.	.	.	.	.	1
Sphyrna tiburo	**13**	**6**	**2**	**.**	**.**	**.**	**21**

Species	Zone						Totals
	A	B	C	D	E	F	
	E=204	E=204	E=276	E=288	E=192	E=192	E=1,356
Stellifer lanceolatus	974	96	3	146	.	.	1,219
Stephanolepis hispida	1	10	5	.	.	.	16
Stomolophus meleagris	4	.	12	.	.	.	16
Strongylura marina	2	6	82	14	5	14	123
Strongylura notata	.	.	.	1	.	.	1
Strongylura spp.	2	.	3	7	18	30	60
Symphurus civitatum	.	6	.	6	.	.	12
Symphurus plagiusa	118	158	115	19	.	.	410
Symphurus sp.	.	1	.	.	.	.	1
Syngnathus fuscus	3	3	1	.	.	.	7
Syngnathus louisianae	9	8	7	6	.	.	30
Syngnathus scovelli	2	3	2	16	2	2	27
Synodus foetens	4	4	16	1	.	.	25
Trachinotus carolinus	**30**	**11**	**28**	**.**	**.**	**.**	**69**
Trachinotus falcatus	**7**	**7**	**7**	**1**	**.**	**.**	**22**
Trichiurus lepturus	15	4	.	.	.	.	19
Trinectes maculatus	83	58	15	229	327	120	832
Tylosurus crocodilus	.	.	9	.	.	.	9
Unidentified species	.	.	1	.	.	.	1
Urophycis floridana	1	3	1	.	.	.	5
Xiphopenaeus kroyeri	3	.	1	.	.	.	4
Totals	**36,327**	**47,319**	**28,986**	**20,668**	**8,440**	**16,797**	**158,537**

Effort, or the total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

A.9 Northern Indian River Lagoon

Table A.25: Monthly summary of taxa collected during northern Indian River Lagoon stratified-random sampling, 2023.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=57	E=57	E=47	E=57	E=47	E=57	E=47	E=57	E=57	E=57	E=57	E=57	E=654
Abudefduf saxatilis	.	.	.	.	.	.	.	3	.	.	.	.	3
Achirus lineatus	22	13	4	.	2	10	19	12	7	6	2	15	112
***Albula* spp.**	**.**	**2**	**9**	**2**	**1**	**.**	**2**	**.**	**1**	**.**	**.**	**.**	**17**
Aluterus schoepfii	.	.	.	.	1	3	.	.	.	.	.	.	4
Anchoa cubana	.	.	.	.	.	.	.	.	.	.	448	.	448
Anchoa hepsetus	.	1	.	402	200	4	1	.	1	.	1	.	610
Anchoa lamprotaenia	21	.	.	.	.	.	.	.	.	.	.	.	21
Anchoa lyolepis	.	.	.	.	2	.	.	.	.	.	8,576	1	8,579
Anchoa mitchilli	2,390	19,019	2,572	31,575	3,185	876	2,287	4,184	3,277	2,726	87,099	4,308	163,498
Anchoa spp.	.	.	.	.	.	.	.	.	2	.	.	.	2
Archosargus probatocephalus	**17**	**11**	**10**	**21**	**54**	**41**	**86**	**79**	**25**	**17**	**12**	**5**	**378**
Archosargus rhomboidalis	4	80	.	2	11	18	100	18	27	64	83	20	427
Archosargus sp.	.	.	.	.	.	.	.	.	.	.	1	.	1
Ariopsis felis	52	55	141	361	414	175	308	214	88	97	72	111	2,088
Atherinomorus stipes	.	.	.	.	.	.	.	.	.	.	.	1	1
Bagre marinus	.	1	4	.	1	3	4	1	2	4	.	1	21

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=57	E=57	E=47	E=57	E=47	E=57	E=47	E=57	E=57	E=57	E=57	E=57	E=654
Bairdiella chrysoura	43	329	104	737	527	650	429	319	6	43	92	574	3,853
Bathygobius soporator	22	3	2	.	1	.	.	.	.	1	1	.	30
***Brevoortia* spp.**	**60**	**1,728**	**184**	**428**	**15**	**396**	**692**	**41**	**.**	**34**	**.**	**7**	**3,585**
Calamus penna	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Callinectes bocourti	.	1	.	.	.	.	.	.	.	.	.	.	1
Callinectes ornatus	.	.	3	.	2	10	4	.	.	.	.	.	19
Callinectes sapidus	**164**	**36**	**85**	**28**	**24**	**16**	**33**	**51**	**16**	**89**	**7**	**20**	**569**
Callinectes similis	.	.	2	1	.	1	.	.	1	.	.	.	5
Callinectes spp.	1	.	.	.	.	.	1	.	.	.	.	.	2
Caranx bartholomaei	.	.	.	.	.	.	.	.	11	.	.	.	11
Caranx crysos	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**
Caranx hippos	**2**	**3**	**7**	**14**	**6**	**198**	**17**	**3**	**5**	**7**	**14**	**16**	**292**
Caranx latus	1	.	.	.	.	.	1	.	.	.	13	1	16
Caranx ruber	.	.	.	.	.	1	.	.	.	.	.	.	1
Caranx spp.	.	.	.	.	3	.	.	.	.	.	.	.	3
Centropomus ensiferus	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**11**	**.**	**11**
Centropomus parallelus	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**
Centropomus pectinatus	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**6**	**6**
Centropomus sp.	.	1	.	.	.	.	.	.	.	.	.	.	1
Centropomus undecimalis	**75**	**127**	**26**	**63**	**24**	**18**	**19**	**119**	**52**	**35**	**143**	**77**	**778**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=57	E=57	E=47	E=57	E=47	E=57	E=47	E=57	E=57	E=57	E=57	E=57	E=654
Chaetodipterus faber	.	.	.	2	.	.	3	3	.	.	2	1	11
Charybdis hellerii	.	.	1	.	.	.	.	.	.	.	.	.	1
Chasmodes saburrae	.	5	9	3	9	75	52	135	4	2	1	3	298
Chilomycterus schoepfii	9	5	31	45	21	20	15	23	2	.	2	17	190
Chilomycterus sp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Chloroscombrus chrysurus	.	.	6	.	.	.	4	.	1	.	.	.	11
Citharichthys macrops	.	.	.	1	.	.	.	.	.	.	.	.	1
Citharichthys spilopterus	4	7	10	2	2	4	11	5	2	.	2	5	54
Clupeiformes sp.	.	.	.	.	.	.	.	.	.	.	1	.	1
Corvula sanctaeluciae	.	.	.	.	.	.	3	.	.	.	.	.	3
Ctenogobius boleosoma	2	7	.	21	.	.	2	1	.	1	.	.	34
Ctenogobius fasciatus	.	1	.	.	.	.	.	.	.	.	.	.	1
Ctenogobius pseudofasciatus	.	5	.	.	.	2	.	.	.	.	.	.	7
Ctenogobius shufeldti	.	2	.	.	.	.	.	.	.	1	.	.	3
Ctenogobius smaragdus	20	2	.	.	.	.	1	24	2	1	.	.	50
Ctenogobius spp.	.	.	.	.	.	1	.	.	.	.	1	.	2
Cynoscion complex	**.**	**.**	**.**	**.**	**3**	**71**	**.**	**1**	**.**	**3**	**1**	**.**	**79**
Cynoscion nebulosus	**5**	**3**	**6**	**4**	**63**	**52**	**63**	**25**	**48**	**23**	**14**	**18**	**324**
Cyprinodon variegatus	.	.	.	2	.	.	.	.	.	.	.	.	2
Dajaus monticola	.	.	.	.	.	.	.	.	.	.	.	8	8

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=57	E=57	E=47	E=57	E=47	E=57	E=47	E=57	E=57	E=57	E=57	E=57	E=654
Diapterus auratus	619	523	102	583	555	454	240	590	1,143	507	649	744	6,709
Diapterus rhombeus	2	.	.	.	.	.	6	13	8	1	6	1	37
Diplodus holbrookii	.	.	.	.	.	.	.	.	.	1	.	.	1
Dormitator maculatus	3	2	.	.	.	6	.	1	.	.	.	.	12
Dorosoma cepedianum	.	.	.	.	.	.	.	.	.	1	.	.	1
Eleotris amblyopsis	.	1	.	.	.	.	.	.	.	.	.	.	1
Elops saurus	**17**	**72**	**18**	**23**	**69**	**31**	**38**	**22**	**11**	**27**	**37**	**23**	**388**
Elops spp.	.	2	.	.	.	.	.	.	.	.	.	.	2
Eucinostomus gula	28	36	106	197	97	149	214	296	222	17	72	44	1,478
Eucinostomus harengulus	92	143	443	453	1,003	789	579	583	197	44	349	771	5,446
Eucinostomus jonesii	3	1	12	8	13	8	15	9	32	6	35	5	147
Eucinostomus melanopterus	.	2	.	1	.	1	.	.	1	.	.	.	5
Eucinostomus spp.	2,550	1,230	343	270	121	785	1,187	197	607	1,933	506	4,343	14,072
Eugerres plumieri	147	47	4	18	3	147	173	75	40	24	126	39	843
Evorthodus lyricus	59	14	.	.	.	.	.	.	.	.	.	.	73
Farfantepenaeus aztecus	**5**	**4**	**1**	**7**	**16**	**1**	**5**	**1**	**.**	**.**	**.**	**3**	**43**
Farfantepenaeus duorarum	**13**	**4**	**4**	**.**	**1**	**1**	**1**	**.**	**.**	**.**	**.**	**1**	**25**
***Farfantepenaeus* spp.**	**297**	**106**	**37**	**92**	**125**	**33**	**74**	**3**	**40**	**80**	**17**	**14**	**918**
Floridichthys carpio	40	13	21	39	1	132	24	168	69	106	51	.	664
Fundulus chrysotus	1	1	.	.	.	1	.	.	.	.	.	.	3

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=57	E=57	E=47	E=57	E=47	E=57	E=47	E=57	E=57	E=57	E=57	E=57	E=654
Fundulus grandis	.	1	.	.	.	.	.	.	.	.	.	.	1
Fundulus seminolis	.	.	.	.	.	.	.	2	.	.	.	.	2
Fundulus similis	.	.	.	1	.	.	.	.	.	.	.	.	1
Gambusia holbrooki	262	151	.	20	.	4	.	34	35	2	8	102	618
Gerreidae sp.	1	.	.	.	.	.	.	.	.	.	.	.	1
Gerres cinereus	4	2	1	4	1	1	29	6	5	.	7	2	62
Gobiesox strumosus	1	.	.	1	.	.	.	.	.	.	1	.	3
Gobiidae sp.	.	.	.	.	.	.	.	.	1	.	.	.	1
Gobioides broussonnetii	.	3	.	.	.	.	.	.	.	.	.	.	3
Gobiomorus dormitor	4	.	.	.	.	1	.	.	.	.	.	.	5
Gobionellus oceanicus	14	6	.	.	.	.	.	.	.	12	2	1	35
Gobiosoma bosc	1	.	1	4	3	7	.	.	1	.	.	.	17
Gobiosoma robustum	13	33	8	18	53	91	95	295	15	.	2	1	624
Gobiosoma spp.	18	16	3	9	55	62	270	226	13	50	27	18	767
Gymnura lessae	1	.	.	1	1	1	1	.	.	.	2	1	8
Haemulon parra	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**71**	**.**	**.**	**.**	**.**	**73**
Harengula humeralis	.	.	.	.	.	.	1	.	.	.	.	.	1
Harengula jaguana	4	19	104	299	622	140	1,538	118	350	768	1,964	1,217	7,143
Hemichromis letourneuxi	.	.	.	.	.	.	.	2	.	.	11	2	15
Heterandria formosa	.	3	.	.	.	1	.	.	.	.	1	.	5

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=57	E=57	E=47	E=57	E=47	E=57	E=47	E=57	E=57	E=57	E=57	E=57	E=654
Hippocampus erectus	.	.	.	.	.	2	.	.	.	.	.	.	2
Hippocampus zosterae	.	.	.	.	.	2	4	.	.	.	.	.	6
Histrio histrio	.	.	.	.	.	.	1	.	.	.	.	.	1
Hypanus americanus	.	.	2	.	.	.	1	.	.	.	.	.	3
Hypanus sabinus	82	120	70	58	77	49	63	65	25	53	37	75	774
Hypanus say	12	16	14	21	52	22	19	31	15	11	7	10	230
Hyporhamphus meeki	1	.	2	.	.	2	1	.	.	2	.	.	8
Hyporhamphus spp.	.	.	.	.	3	.	.	.	.	.	1	.	4
Labidesthes vanhyningi	1	1	.	3	.	.	.	4	5	12	19	52	97
Lactophrys trigonus	1	.	.	.	1	.	.	.	.	.	.	.	2
Lagodon rhomboides	7	43	18	64	13	256	195	162	299	35	20	39	1,151
Leiostomus xanthurus	**45**	**221**	**63**	**47**	**8**	**58**	**7**	**.**	**.**	**2**	**1**	**2**	**454**
Lepisosteus osseus	.	.	.	.	.	1	.	.	.	2	1	1	5
Lepisosteus platyrhincus	1	1	.	.	.	.	.	1	.	.	.	.	3
Lepomis gulosus	.	4	.	.	.	.	.	.	.	.	.	.	4
Lepomis macrochirus	11	16	.	.	.	.	.	.	.	10	4	.	41
Lepomis microlophus	17	2	.	.	.	3	.	5	7	.	.	.	34
Lepomis spp.	.	.	.	.	.	1	.	3	.	1	7	.	12
Limulus polyphemus	2	5	3	2	.	.	2	1	2	.	.	.	17
Litopenaeus setiferus	**3**	**3**	**1**	**4**	**1**	**.**	**40**	**1**	**2**	**7**	**4**	**4**	**70**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=57	E=57	E=47	E=57	E=47	E=57	E=47	E=57	E=57	E=57	E=57	E=57	E=654
Lobotes surinamensis	**2**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**2**
Lophogobius cyprinoides	88	131	1	4	.	18	.	81	8	6	4	.	341
Lucania goodei	.	.	.	1	.	6	.	7	.	.	.	1	15
Lucania parva	1	13	.	7	12	123	76	466	55	11	37	153	954
Lupinoblennius nicholsi	.	1	.	.	.	.	.	.	.	.	.	.	1
Lupinoblennius vinctus	.	.	.	.	1	.	.	.	.	.	.	.	1
Lutjanus analis	**.**	**4**	**.**	**.**	**2**	**.**	**3**	**1**	**3**	**.**	**4**	**1**	**18**
Lutjanus griseus	**4**	**1**	**.**	**4**	**12**	**21**	**16**	**33**	**26**	**3**	**14**	**3**	**137**
Lutjanus synagris	**.**	**.**	**.**	**.**	**1**	**8**	**.**	**.**	**.**	**.**	**.**	**.**	**9**
Mayaheros urophthalmus	5	20	.	1	.	5	1	113	23	.	.	.	168
Megalops atlanticus	**.**	**.**	**.**	**2**	**.**	**.**	**3**	**1**	**.**	**1**	**1**	**.**	**8**
Membras martinica	.	.	.	4	20	65	50	29	.	.	5	3	176
Menidia spp.	476	70	92	194	206	225	93	245	260	28	285	88	2,262
Menippe sp.	1	.	.	.	.	.	.	.	.	.	.	.	1
Menticirrhus americanus	**6**	**6**	**20**	**6**	**4**	**653**	**218**	**6**	**6**	**67**	**41**	**6**	**1,039**
Microgobius gulosus	43	44	18	15	104	320	543	330	285	113	73	122	2,010
Microgobius microlepis	5	2	.	.	.	5	37	.	.	.	.	.	49
Microgobius thalassinus	.	3	.	.	.	.	.	.	.	1	.	.	4
Micropogonias undulatus	**480**	**38**	**41**	**27**	**4**	**36**	**4**	**.**	**2**	**11**	**678**	**5**	**1,326**
Micropterus salmoides	.	.	.	.	.	3	.	.	1	.	.	.	4

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=57	E=57	E=47	E=57	E=47	E=57	E=47	E=57	E=57	E=57	E=57	E=57	E=654
Monacanthus ciliatus	.	.	.	.	.	1	.	.	.	.	.	.	1
Mugil cephalus	**163**	**939**	**98**	**102**	**81**	**49**	**97**	**110**	**105**	**89**	**94**	**91**	**2,018**
Mugil curema	**619**	**719**	**335**	**488**	**233**	**226**	**145**	**135**	**125**	**133**	**315**	**549**	**4,022**
Mugil rubrioculus	**28**	**.**	**.**	**1**	**.**	**1**	**2**	**.**	**.**	**2**	**2**	**9**	**45**
Mugil spp.	134	3	.	8	.	1	.	.	.	.	.	.	146
Mugil trichodon	**78**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**79**
Mycteroperca microlepis	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Myrophis punctatus	.	.	.	.	.	.	.	.	.	.	1	.	1
Ocyurus chrysurus	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**1**
Oligoplites saurus	2	2	10	10	28	48	49	51	57	21	14	16	308
Opisthonema oglinum	.	9	2	180	77	209	37	28	552	29	697	21	1,841
Opsanus tau	.	2	1	2	4	1	2	2	1	2	2	.	19
Oreochromis complex	.	.	.	1	.	.	.	1	2	.	.	.	4
Sarotherodon spp.	4	.	.	.	.	2	.	2	4	.	.	.	12
Orthopristis chrysoptera	.	7	5	10	3	65	19	16	.	2	2	4	133
Paralichthys albigutta	**.**	**1**	**1**	**.**	**1**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**4**
Paralichthys lethostigma	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**1**
Poecilia latipinna	62	13	.	.	.	.	.	.	1	.	.	.	76
Pogonias cromis	**6**	**29**	**18**	**72**	**31**	**6**	**33**	**124**	**13**	**12**	**30**	**27**	**401**
Pomatomus saltatrix	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**1**	**.**	**2**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=57	E=57	E=47	E=57	E=47	E=57	E=47	E=57	E=57	E=57	E=57	E=57	E=654
Portunus spp.	.	.	2	.	.	1	.	.	.	.	.	.	3
Prionotus scitulus	.	1	1	.	1	.	.	.	.	.	.	.	3
Prionotus tribulus	2	.	3	2	.	.	.	.	2	.	.	2	11
Sardinella aurita	.	1	.	.	.	.	1	.	.	.	.	.	2
Sarotherodon melanotheron	.	.	.	.	1	.	.	1	.	.	.	.	2
Sciaenops ocellatus	**37**	**50**	**16**	**43**	**28**	**23**	**18**	**25**	**32**	**39**	**57**	**46**	**414**
Scomberomorus maculatus	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**.**	**.**	**.**	**.**	**.**	**2**
Selene vomer	.	.	.	2	4	.	.	.	16	.	2	.	24
Sphoeroides nephelus	27	47	49	34	47	14	45	35	27	13	9	10	357
Sphoeroides spengleri	.	.	.	1	1	.	.	.	.	.	.	2	4
Sphoeroides testudineus	15	92	60	30	38	8	18	11	18	3	40	86	419
Sphyraena barracuda	**3**	**.**	**.**	**.**	**.**	**1**	**2**	**6**	**1**	**3**	**1**	**3**	**20**
Stephanolepis hispida	2	.	1	.	.	35	.	.	2	.	.	1	41
Strongylura marina	.	.	.	1	.	.	.	.	1	.	.	.	2
Strongylura notata	6	1	6	3	11	12	53	75	15	22	12	5	221
Strongylura spp.	.	.	1	1	.	2	.	.	.	.	2	.	6
Strongylura timucu	.	.	1	1	.	.	.	.	.	.	.	.	2
Symphurus plagiusa	3	1	1	.	.	.	.	1	.	.	.	.	6
Syngnathus louisianae	2	2	7	1	5	8	16	.	.	.	9	3	53
Syngnathus scovelli	9	22	17	26	28	89	180	73	11	1	8	8	472

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=57	E=57	E=47	E=57	E=47	E=57	E=47	E=57	E=57	E=57	E=57	E=57	E=654
Synodus foetens	.	.	.	3	2	6	3	1	5	1	.	.	21
Trachinotus carolinus	**.**	**.**	**.**	**.**	**1**	**2**	**2**	**.**	**4**	**21**	**.**	**2**	**32**
Trachinotus falcatus	**4**	**.**	**6**	**1**	**.**	**15**	**28**	**8**	**9**	**4**	**383**	**1**	**459**
Trinectes maculatus	12	17	3	1	.	3	.	11	1	1	1	2	52
Umbrina coroides	.	.	.	.	.	1	.	.	.	.	.	.	1
Totals	**9,626**	**26,606**	**5,413**	**37,250**	**8,457**	**8,208**	**10,777**	**10,275**	**8,398**	**7,509**	**103,397**	**14,001**	**249,917**

Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.26: Summary by gear and stratum of taxa collected during northern Indian River Lagoon stratified-random sampling, 2023.

Species	Gear and Strata							Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	
	E=88	E=56	E=192	E=66	E=24	E=191	E=37	E=654
Abudefduf saxatilis	.	.	3	.	.	.	.	3
Achirus lineatus	18	21	35	7	4	21	6	112
***Albula* spp.**	**3**	**.**	**13**	**.**	**.**	**1**	**.**	**17**
Aluterus schoepfii	3	.	.	.	.	1	.	4
Anchoa cubana	.	.	448	.	.	.	.	448
Anchoa hepsetus	33	6	570	1	.	.	.	610
Anchoa lamprotaenia	.	.	21	.	.	.	.	21
Anchoa lyolepis	1	.	8,578	.	.	.	.	8,579
Anchoa mitchilli	5,738	12,660	120,990	22,697	1,413	.	.	163,498
Anchoa spp.	2	.	.	.	.	.	.	2
Archosargus probatocephalus	**24**	**2**	**89**	**18**	**7**	**200**	**38**	**378**
Archosargus rhomboidalis	1	.	5	.	.	418	3	427
Archosargus sp.	.	.	.	.	.	1	.	1
Ariopsis felis	179	70	65	1	.	1,419	354	2,088
Atherinomorus stipes	.	.	1	.	.	.	.	1
Bagre marinus	.	.	1	.	.	12	8	21
Bairdiella chrysoura	736	14	691	107	.	1,493	812	3,853
Bathygobius soporator	.	.	4	7	19	.	.	30
***Brevoortia* spp.**	**12**	**113**	**444**	**1,701**	**134**	**773**	**408**	**3,585**
Calamus penna	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Callinectes bocourti	.	.	.	1	.	.	.	1
Callinectes ornatus	6	.	1	.	2	10	.	19
Callinectes sapidus	**14**	**19**	**172**	**120**	**26**	**148**	**70**	**569**
Callinectes similis	1	.	1	.	.	2	1	5
Callinectes spp.	1	.	.	.	1	.	.	2
Caranx bartholomaei	.	.	.	.	.	11	.	11

Species	Gear and Strata							Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	
	E=88	E=56	E=192	E=66	E=24	E=191	E=37	E=654
Caranx crysos	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Caranx hippos	**2**	**.**	**5**	**1**	**.**	**88**	**196**	**292**
Caranx latus	.	.	1	.	.	15	.	16
Caranx ruber	.	.	1	.	.	.	.	1
Caranx spp.	.	.	.	.	.	3	.	3
Centropomus ensiferus	**.**	**.**	**.**	**11**	**.**	**.**	**.**	**11**
Centropomus parallelus	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**1**
Centropomus pectinatus	**.**	**.**	**.**	**6**	**.**	**.**	**.**	**6**
Centropomus sp.	.	.	.	1	.	.	.	1
Centropomus undecimalis	**.**	**.**	**7**	**418**	**49**	**276**	**28**	**778**
Chaetodipterus faber	.	.	.	.	.	8	3	11
Charybdis hellerii	.	.	.	.	.	.	1	1
Chasmodes saburrae	140	2	156	.	.	.	.	298
Chilomycterus schoepfii	2	1	6	.	.	135	46	190
Chilomycterus sp.	1	.	.	.	.	.	.	1
Chloroscombrus chrysurus	.	.	.	.	.	5	6	11
Citharichthys macrops	.	.	.	.	.	1	.	1
Citharichthys spilopterus	4	.	24	1	.	24	1	54
Clupeiformes sp.	.	1	.	.	.	.	.	1
Corvula sanctaeluciae	.	.	.	.	.	3	.	3
Ctenogobius boleosoma	24	.	10	.	.	.	.	34
Ctenogobius fasciatus	.	.	.	1	.	.	.	1
Ctenogobius pseudofasciatus	.	.	.	7	.	.	.	7
Ctenogobius shufeldti	.	.	.	3	.	.	.	3
Ctenogobius smaragdus	1	2	47	.	.	.	.	50
Ctenogobius spp.	.	.	1	.	1	.	.	2
Cynoscion complex	**.**	**3**	**5**	**.**	**.**	**.**	**71**	**79**
Cynoscion nebulosus	**110**	**3**	**166**	**.**	**.**	**38**	**7**	**324**

Species	Gear and Strata							Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	
	E=88	E=56	E=192	E=66	E=24	E=191	E=37	E=654
Cyprinodon variegatus	.	.	2	.	.	.	.	2
Dajaus monticola	.	.	.	8	.	.	.	8
Diapterus auratus	26	48	1,003	2,033	1,016	2,442	141	6,709
Diapterus rhombeus	1	3	27	2	.	1	3	37
Diplodus holbrookii	.	.	.	.	.	1	.	1
Dormitator maculatus	.	.	.	7	5	.	.	12
Dorosoma cepedianum	.	.	.	.	.	1	.	1
Eleotris amblyopsis	.	.	.	1	.	.	.	1
Elops saurus	**1**	**.**	**63**	**19**	**1**	**243**	**61**	**388**
Elops spp.	.	.	2	.	.	.	.	2
Eucinostomus gula	84	27	671	9	1	554	132	1,478
Eucinostomus harengulus	30	51	827	296	162	3,572	508	5,446
Eucinostomus jonesii	5	2	118	.	.	22	.	147
Eucinostomus melanopterus	.	.	1	.	.	4	.	5
Eucinostomus spp.	1,481	296	6,260	4,222	1,813	.	.	14,072
Eugerres plumieri	1	44	238	359	126	74	1	843
Evorthodus lyricus	.	.	.	69	4	.	.	73
Farfantepenaeus aztecus	**8**	**2**	**24**	**.**	**.**	**7**	**2**	**43**
Farfantepenaeus duorarum	**2**	**4**	**13**	**.**	**.**	**2**	**4**	**25**
***Farfantepenaeus* spp.**	**178**	**95**	**507**	**93**	**34**	**2**	**9**	**918**
Floridichthys carpio	43	.	621	.	.	.	.	664
Fundulus chrysotus	.	.	.	.	3	.	.	3
Fundulus grandis	.	.	1	.	.	.	.	1
Fundulus seminolis	.	.	.	.	2	.	.	2
Fundulus similis	.	.	1	.	.	.	.	1
Gambusia holbrooki	.	.	.	400	218	.	.	618
Gerreidae sp.	.	.	.	1	.	.	.	1
Gerres cinereus	2	.	2	13	2	39	4	62

Species	Gear and Strata							Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	
	E=88	E=56	E=192	E=66	E=24	E=191	E=37	E=654
Gobiesox strumosus	.	.	3	.	.	.	.	3
Gobiidae sp.	.	.	.	1	.	.	.	1
Gobioides broussonnetii	.	.	.	3	.	.	.	3
Gobiomorus dormitor	.	.	.	5	.	.	.	5
Gobionellus oceanicus	.	20	5	10	.	.	.	35
Gobiosoma bosc	.	.	7	10	.	.	.	17
Gobiosoma robustum	365	3	256	.	.	.	.	624
Gobiosoma spp.	481	10	254	15	7	.	.	767
Gymnura lessae	.	.	.	.	.	6	2	8
Haemulon parra	**2**	**.**	**.**	**.**	**.**	**71**	**.**	**73**
Harengula humeralis	.	.	1	.	.	.	.	1
Harengula jaguana	338	28	6,340	.	1	169	267	7,143
Hemichromis letourneuxi	.	.	.	13	2	.	.	15
Heterandria formosa	.	.	.	4	1	.	.	5
Hippocampus erectus	1	.	1	.	.	.	.	2
Hippocampus zosterae	5	.	1	.	.	.	.	6
Histrio histrio	.	.	.	.	.	1	.	1
Hypanus americanus	.	.	.	.	.	2	1	3
Hypanus sabinus	13	3	35	1	1	622	99	774
Hypanus say	3	2	3	.	.	180	42	230
Hyporhamphus meeki	2	.	.	.	.	4	2	8
Hyporhamphus spp.	2	.	2	.	.	.	.	4
Labidesthes vanhyningi	.	.	.	83	14	.	.	97
Lactophrys trigonus	.	.	.	.	.	2	.	2
Lagodon rhomboides	51	1	59	4	1	1,020	15	1,151
Leiostomus xanthurus	**2**	**1**	**115**	**2**	**252**	**22**	**60**	**454**
Lepisosteus osseus	.	.	.	1	.	2	2	5
Lepisosteus platyrhincus	.	.	.	2	1	.	.	3

Species	Gear and Strata							Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	
	E=88	E=56	E=192	E=66	E=24	E=191	E=37	E=654
Lepomis gulosus	.	.	.	3	1	.	.	4
Lepomis macrochirus	.	.	.	20	21	.	.	41
Lepomis microlophus	.	.	.	10	24	.	.	34
Lepomis spp.	.	.	.	7	5	.	.	12
Limulus polyphemus	1	.	2	.	.	12	2	17
Litopenaeus setiferus	**22**	**3**	**30**	**13**	**.**	**.**	**2**	**70**
Lobotes surinamensis	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**2**
Lophogobius cyprinoides	.	5	2	197	137	.	.	341
Lucania goodei	.	.	.	1	14	.	.	15
Lucania parva	160	2	750	.	42	.	.	954
Lupinoblennius nicholsi	.	.	.	1	.	.	.	1
Lupinoblennius vinctus	.	.	1	.	.	.	.	1
Lutjanus analis	**.**	**.**	**.**	**.**	**.**	**18**	**.**	**18**
Lutjanus griseus	**19**	**1**	**15**	**11**	**15**	**53**	**23**	**137**
Lutjanus synagris	**.**	**.**	**.**	**.**	**.**	**9**	**.**	**9**
Mayaheros urophthalmus	1	.	1	27	136	1	2	168
Megalops atlanticus	**.**	**.**	**.**	**.**	**.**	**8**	**.**	**8**
Membras martinica	5	36	135	.	.	.	.	176
Menidia spp.	33	5	1,682	86	456	.	.	2,262
Menippe sp.	.	.	.	.	.	1	.	1
Menticirrhus americanus	**2**	**45**	**82**	**1**	**.**	**270**	**639**	**1,039**
Microgobius gulosus	971	39	897	19	84	.	.	2,010
Microgobius microlepis	39	.	10	.	.	.	.	49
Microgobius thalassinus	.	4	.	.	.	.	.	4
Micropogonias undulatus	**9**	**63**	**479**	**676**	**5**	**22**	**72**	**1,326**
Micropterus salmoides	.	.	.	3	1	.	.	4
Monacanthus ciliatus	1	.	.	.	.	.	.	1
Mugil cephalus	**263**	**10**	**626**	**1**	**94**	**793**	**231**	**2,018**

Species	Gear and Strata							Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	
	E=88	E=56	E=192	E=66	E=24	E=191	E=37	E=654
Mugil curema	**5**	**19**	**373**	**7**	**68**	**3,106**	**444**	**4,022**
Mugil rubrioculus	**.**	**.**	**1**	**.**	**.**	**14**	**30**	**45**
Mugil spp.	.	.	143	1	2	.	.	146
Mugil trichodon	**.**	**.**	**79**	**.**	**.**	**.**	**.**	**79**
Mycteroperca microlepis	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Myrophis punctatus	.	.	.	.	.	1	.	1
Ocyurus chrysurus	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Oligoplites saurus	11	8	127	.	.	124	38	308
Opisthonema oglinum	700	47	939	1	.	71	83	1,841
Opsanus tau	3	2	1	.	.	8	5	19
Oreochromis complex	.	.	.	.	4	.	.	4
Sarotherodon spp.	.	.	.	2	10	.	.	12
Orthopristis chrysoptera	14	7	1	.	.	111	.	133
Paralichthys albigutta	**1**	**.**	**2**	**.**	**.**	**1**	**.**	**4**
Paralichthys lethostigma	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Poecilia latipinna	.	.	.	18	58	.	.	76
Pogonias cromis	**.**	**.**	**17**	**.**	**.**	**367**	**17**	**401**
Pomatomus saltatrix	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**2**
Portunus spp.	.	.	3	.	.	.	.	3
Prionotus scitulus	1	.	.	.	.	1	1	3
Prionotus tribulus	.	.	4	.	.	6	1	11
Sardinella aurita	.	.	1	.	.	1	.	2
Sarotherodon melanotheron	.	.	.	1	.	1	.	2
Sciaenops ocellatus	**7**	**20**	**142**	**14**	**15**	**190**	**26**	**414**
Scomberomorus maculatus	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**2**
Selene vomer	.	.	.	.	.	23	1	24
Sphoeroides nephelus	33	2	10	1	.	236	75	357
Sphoeroides spengleri	.	.	1	.	.	3	.	4

Species	Gear and Strata							Totals
	21.3-m bay seine			21.3-m river seine		183-m haul seine		
	Veg	Unveg	Shore	Over	Nonover	Over	Nonover	
	E=88	E=56	E=192	E=66	E=24	E=191	E=37	E=654
Sphoeroides testudineus	9	18	48	.	.	319	25	419
Sphyraena barracuda	**.**	**.**	**2**	**1**	**.**	**16**	**1**	**20**
Stephanolepis hispida	31	.	4	.	.	5	1	41
Strongylura marina	.	.	.	1	.	1	.	2
Strongylura notata	14	15	169	2	.	15	6	221
Strongylura spp.	.	.	3	3	.	.	.	6
Strongylura timucu	.	.	1	.	1	.	.	2
Symphurus plagiusa	.	2	3	.	.	1	.	6
Syngnathus louisianae	25	2	25	.	1	.	.	53
Syngnathus scovelli	229	.	239	2	2	.	.	472
Synodus foetens	4	.	12	1	.	4	.	21
Trachinotus carolinus	**.**	**.**	**7**	**.**	**.**	**25**	**.**	**32**
Trachinotus falcatus	**1**	**.**	**48**	**4**	**.**	**394**	**12**	**459**
Trinectes maculatus	.	.	.	31	18	3	.	52
Umbrina coroides	.	.	1	.	.	.	.	1
Totals	**12,797**	**13,912**	**157,142**	**33,962**	**6,537**	**20,412**	**5,155**	**249,917**

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 was not stratified. Sampling with 183-m haul seine was stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.27: Summary by zone of taxa collected during northern Indian River Lagoon stratified-random sampling, 2023.

Species	Zone					Totals
	C	D	E	H	F	
	E=168	E=168	E=48	E=180	E=90	E=654
Abudefduf saxatilis	.	.	.	3	.	3
Achirus lineatus	46	1	6	48	11	112
***Albula* spp.**	**1**	**.**	**1**	**15**	**.**	**17**
Aluterus schoepfii	.	.	.	4	.	4
Anchoa cubana	.	.	.	448	.	448
Anchoa hepsetus	.	.	.	609	1	610
Anchoa lamprotaenia	.	.	.	21	.	21
Anchoa lyolepis	.	.	.	8,579	.	8,579
Anchoa mitchilli	26,306	7,547	.	105,535	24,110	163,498
Anchoa spp.	2	.	.	.	.	2
Archosargus probatocephalus	**49**	**64**	**19**	**221**	**25**	**378**
Archosargus rhomboidalis	.	15	17	395	.	427
Archosargus sp.	.	.	.	1	.	1
Ariopsis felis	704	724	327	332	1	2,088
Atherinomorus stipes	.	.	.	1	.	1
Bagre marinus	9	2	4	6	.	21
Bairdiella chrysoura	2,870	143	634	99	107	3,853
Bathygobius soporator	1	.	.	3	26	30
***Brevoortia* spp.**	**768**	**146**	**105**	**731**	**1,835**	**3,585**
Calamus penna	**.**	**.**	**.**	**1**	**.**	**1**
Callinectes bocourti	.	.	.	.	1	1
Callinectes ornatus	.	.	.	17	2	19
Callinectes sapidus	**95**	**14**	**22**	**292**	**146**	**569**
Callinectes similis	1	.	.	4	.	5
Callinectes spp.	.	.	.	1	1	2
Caranx bartholomaei	.	.	.	11	.	11
Caranx crysos	**.**	**.**	**.**	**1**	**.**	**1**

Species	Zone					Totals
	C	D	E	H	F	
	E=168	E=168	E=48	E=180	E=90	E=654
Caranx hippos	**16**	**204**	**9**	**62**	**1**	**292**
Caranx latus	1	.	.	15	.	16
Caranx ruber	.	.	.	1	.	1
Caranx spp.	.	.	.	3	.	3
Centropomus ensiferus	**.**	**.**	**.**	**.**	**11**	**11**
Centropomus parallelus	**.**	**.**	**.**	**.**	**1**	**1**
Centropomus pectinatus	**.**	**.**	**.**	**.**	**6**	**6**
Centropomus sp.	.	.	.	.	1	1
Centropomus undecimalis	**28**	**34**	**24**	**225**	**467**	**778**
Chaetodipterus faber	3	1	2	5	.	11
Charybdis hellerii	.	.	.	1	.	1
Chasmodes saburrae	253	33	.	12	.	298
Chilomycterus schoepfii	61	24	52	53	.	190
Chilomycterus sp.	1	.	.	.	.	1
Chloroscombrus chrysurus	8	.	.	3	.	11
Citharichthys macrops	.	.	.	1	.	1
Citharichthys spilopterus	.	.	.	53	1	54
Clupeiformes sp.	.	.	.	1	.	1
Corvula sanctaeluciae	.	.	.	3	.	3
Ctenogobius boleosoma	.	6	.	28	.	34
Ctenogobius fasciatus	.	.	.	.	1	1
Ctenogobius pseudofasciatus	.	.	.	.	7	7
Ctenogobius shufeldti	.	.	.	.	3	3
Ctenogobius smaragdus	.	.	.	50	.	50
Ctenogobius spp.	.	.	.	1	1	2
Cynoscion complex	**75**	**.**	**.**	**4**	**.**	**79**
Cynoscion nebulosus	**185**	**58**	**19**	**62**	**.**	**324**
Cyprinodon variegatus	.	2	.	.	.	2
Dajaus monticola	.	.	.	.	8	8

Species	Zone					Totals
	C	D	E	H	F	
	E=168	E=168	E=48	E=180	E=90	E=654
Diapterus auratus	522	228	372	2,538	3,049	6,709
Diapterus rhombeus	3	.	.	32	2	37
Diplodus holbrookii	.	.	.	1	.	1
Dormitator maculatus	.	.	.	.	12	12
Dorosoma cepedianum	.	.	.	1	.	1
Eleotris amblyopsis	.	.	.	.	1	1
Elops saurus	**114**	**121**	**63**	**70**	**20**	**388**
Elops spp.	2	.	.	.	.	2
Eucinostomus gula	274	45	48	1,101	10	1,478
Eucinostomus harengulus	971	1,423	1,297	1,297	458	5,446
Eucinostomus jonesii	10	.	.	137	.	147
Eucinostomus melanopterus	1	.	.	4	.	5
Eucinostomus spp.	512	82	.	7,443	6,035	14,072
Eugerres plumieri	284	28	35	11	485	843
Evorthodus lyricus	.	.	.	.	73	73
Farfantepenaeus aztecus	**13**	**1**	**1**	**28**	**.**	**43**
Farfantepenaeus duorarum	**11**	**.**	**2**	**12**	**.**	**25**
***Farfantepenaeus* spp.**	**47**	**2**	**6**	**736**	**127**	**918**
Floridichthys carpio	117	527	.	20	.	664
Fundulus chrysotus	.	.	.	.	3	3
Fundulus grandis	.	1	.	.	.	1
Fundulus seminolis	.	.	.	.	2	2
Fundulus similis	.	1	.	.	.	1
Gambusia holbrooki	.	.	.	.	618	618
Gerreidae sp.	.	.	.	.	1	1
Gerres cinereus	3	.	1	43	15	62
Gobiesox strumosus	3	.	.	.	.	3
Gobiidae sp.	.	.	.	.	1	1
Gobioides broussonnetii	.	.	.	.	3	3

Species	Zone					Totals
	C	D	E	H	F	
	E=168	E=168	E=48	E=180	E=90	E=654
Gobiomorus dormitor	.	.	.	.	5	5
Gobionellus oceanicus	.	.	.	25	10	35
Gobiosoma bosc	4	2	.	1	10	17
Gobiosoma robustum	212	281	.	131	.	624
Gobiosoma spp.	153	258	.	334	22	767
Gymnura lessae	3	.	.	5	.	8
Haemulon parra	**.**	**.**	**.**	**73**	**.**	**73**
Harengula humeralis	.	.	.	1	.	1
Harengula jaguana	318	23	6	6,795	1	7,143
Hemichromis letourneuxi	.	.	.	.	15	15
Heterandria formosa	.	.	.	.	5	5
Hippocampus erectus	.	.	.	2	.	2
Hippocampus zosterae	.	.	.	6	.	6
Histrio histrio	.	.	.	1	.	1
Hypanus americanus	1	.	.	2	.	3
Hypanus sabinus	207	171	165	229	2	774
Hypanus say	45	48	51	86	.	230
Hyporhamphus meeki	2	2	.	4	.	8
Hyporhamphus spp.	.	3	.	1	.	4
Labidesthes vanhyningi	.	.	.	.	97	97
Lactophrys trigonus	.	.	.	2	.	2
Lagodon rhomboides	7	98	4	1,037	5	1,151
Leiostomus xanthurus	**62**	**20**	**2**	**116**	**254**	**454**
Lepisosteus osseus	1	.	.	3	1	5
Lepisosteus platyrhincus	.	.	.	.	3	3
Lepomis gulosus	.	.	.	.	4	4
Lepomis macrochirus	.	.	.	.	41	41
Lepomis microlophus	.	.	.	.	34	34
Lepomis spp.	.	.	.	.	12	12

Species	Zone					Totals
	C	D	E	H	F	
	E=168	E=168	E=48	E=180	E=90	E=654
Limulus polyphemus	4	6	5	2	.	17
Litopenaeus setiferus	**13**	**.**	**1**	**43**	**13**	**70**
Lobotes surinamensis	**2**	**.**	**.**	**.**	**.**	**2**
Lophogobius cyprinoides	1	.	.	6	334	341
Lucania goodei	.	.	.	.	15	15
Lucania parva	636	275	.	1	42	954
Lupinoblennius nicholsi	.	.	.	.	1	1
Lupinoblennius vinctus	.	.	.	1	.	1
Lutjanus analis	**1**	**.**	**.**	**17**	**.**	**18**
Lutjanus griseus	**31**	**.**	**.**	**80**	**26**	**137**
Lutjanus synagris	**.**	**.**	**.**	**9**	**.**	**9**
Mayaheros urophthalmus	2	3	.	.	163	168
Megalops atlanticus	**.**	**7**	**1**	**.**	**.**	**8**
Membras martinica	94	75	.	7	.	176
Menidia spp.	834	866	.	20	542	2,262
Menippe sp.	.	.	.	1	.	1
Menticirrhus americanus	**750**	**18**	**2**	**268**	**1**	**1,039**
Microgobius gulosus	174	1,520	.	213	103	2,010
Microgobius microlepis	.	.	.	49	.	49
Microgobius thalassinus	.	.	.	4	.	4
Micropogonias undulatus	**133**	**10**	**1**	**501**	**681**	**1,326**
Micropterus salmoides	.	.	.	.	4	4
Monacanthus ciliatus	.	.	.	1	.	1
Mugil cephalus	**959**	**461**	**190**	**313**	**95**	**2,018**
Mugil curema	**969**	**1,237**	**749**	**992**	**75**	**4,022**
Mugil rubrioculus	**33**	**7**	**3**	**2**	**.**	**45**
Mugil spp.	8	.	.	135	3	146
Mugil trichodon	**.**	**.**	**.**	**79**	**.**	**79**
Mycteroperca microlepis	**.**	**.**	**.**	**1**	**.**	**1**

Species	Zone					Totals
	C	D	E	H	F	
	E=168	E=168	E=48	E=180	E=90	E=654
Myrophis punctatus	.	.	.	1	.	1
Ocyurus chrysurus	**.**	**.**	**.**	**1**	**.**	**1**
Oligoplites saurus	105	95	40	68	.	308
Opisthonema oglinum	220	33	40	1,547	1	1,841
Opsanus tau	6	8	4	1	.	19
Oreochromis complex	.	.	.	.	4	4
Sarotherodon spp.	.	.	.	.	12	12
Orthopristis chrysoptera	7	8	.	118	.	133
Paralichthys albigutta	**.**	**.**	**.**	**4**	**.**	**4**
Paralichthys lethostigma	**.**	**1**	**.**	**.**	**.**	**1**
Poecilia latipinna	.	.	.	.	76	76
Pogonias cromis	**26**	**285**	**31**	**59**	**.**	**401**
Pomatomus saltatrix	**.**	**.**	**.**	**2**	**.**	**2**
Portunus spp.	.	.	.	3	.	3
Prionotus scitulus	1	.	.	2	.	3
Prionotus tribulus	2	.	.	9	.	11
Sardinella aurita	.	1	.	1	.	2
Sarotherodon melanotheron	.	.	.	1	1	2
Sciaenops ocellatus	**105**	**125**	**32**	**123**	**29**	**414**
Scomberomorus maculatus	**2**	**.**	**.**	**.**	**.**	**2**
Selene vomer	.	.	.	24	.	24
Sphoeroides nephelus	86	201	38	31	1	357
Sphoeroides spengleri	.	.	.	4	.	4
Sphoeroides testudineus	10	1	.	408	.	419
Sphyraena barracuda	**1**	**.**	**.**	**18**	**1**	**20**
Stephanolepis hispida	.	.	.	41	.	41
Strongylura marina	.	1	.	.	1	2
Strongylura notata	74	99	9	37	2	221
Strongylura spp.	2	1	.	.	3	6

Species	Zone					Totals
	C	D	E	H	F	
	E=168	E=168	E=48	E=180	E=90	E=654
Strongylura timucu	.	.	.	1	1	2
Symphurus plagiusa	1	.	.	5	.	6
Syngnathus louisianae	36	10	.	6	1	53
Syngnathus scovelli	334	70	.	64	4	472
Synodus foetens	.	.	.	20	1	21
Trachinotus carolinus	**2**	**2**	**.**	**28**	**.**	**32**
Trachinotus falcatus	**29**	**5**	**3**	**418**	**4**	**459**
Trinectes maculatus	.	.	.	3	49	52
Umbrina coroides	.	.	.	1	.	1
Totals	**41,078**	**17,814**	**4,443**	**146,083**	**40,499**	**249,917**

Zones C and H were located in the northern Indian River Lagoon; Zones D—E encompassed the Banana River; Zone F encompassed the lower Sebastian River and Turkey Creek. Effort, or the total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

A.10 Southern Indian River Lagoon

Table A.28: Monthly summary of taxa collected during southern Indian River Lagoon stratified-random sampling, 2023.

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=35	E=35	E=12	E=35	E=12	E=35	E=12	E=35	E=35	E=35	E=35	E=35	E=351
Acanthostracion quadricornis	.	.	1	.	.	.	1	.	.	.	.	.	2
Achirus lineatus	4	11	1	11	1	8	1	6	1	7	6	2	59
Aetobatus narinari	.	.	.	.	.	.	.	.	2	.	.	.	2
***Albula* spp.**	**13**	**1**	**.**	**3**	**.**	**1**	**2**	**.**	**.**	**.**	**.**	**3**	**23**
Anchoa cubana	.	.	.	.	.	.	.	.	.	.	.	36	36
Anchoa hepsetus	.	.	.	1	.	.	.	.	.	.	.	304	305
Anchoa lyolepis	1	19	.	.	.	.	.	.	.	.	.	24	44
Anchoa mitchilli	6,592	5,100	.	250	.	214	.	10	40	1	262	7,517	19,986
Anisotremus virginicus	.	.	.	.	.	.	.	.	.	1	.	.	1
Archosargus probatocephalus	**16**	**21**	**18**	**35**	**53**	**18**	**59**	**19**	**22**	**26**	**27**	**23**	**337**
Archosargus rhomboidalis	.	4	3	6	17	.	71	41	4	3	14	12	175
Ariopsis felis	3	26	48	84	85	48	73	78	47	48	29	29	598
Atherinomorus stipes	.	.	.	.	.	.	.	.	6	.	1	.	7
Bagre marinus	.	.	1	1	.	.	11	3	.	.	.	.	16
Bairdiella chrysoura	.	.	.	2	3	.	13	.	.	.	.	.	18
Bathygobius soporator	3	.	.	.	.	2	.	16	1	.	.	1	23

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=35	E=35	E=12	E=35	E=12	E=35	E=12	E=35	E=35	E=35	E=35	E=35	E=351
Brachygenys chrysargyreum	.	.	.	17	.	.	.	.	.	.	.	.	17
***Brevoortia* spp.**	**418**	**101**	**.**	**15**	**.**	**.**	**23**	**.**	**2**	**16**	**5**	**62**	**642**
Callinectes ornatus	.	8	1	8	2	.	1	5	1	2	1	.	29
Callinectes sapidus	**61**	**25**	**1**	**16**	**14**	**19**	**.**	**47**	**10**	**35**	**38**	**31**	**297**
Callinectes similis	2	2	1	3	.	3	80	2	.	3	.	.	96
Callinectes spp.	.	.	.	7	.	.	.	.	2	2	.	.	11
Caranx crysos	**3**	**.**	**.**	**3**	**.**	**.**	**.**	**.**	**.**	**7**	**1**	**.**	**14**
Caranx hippos	**10**	**8**	**8**	**8**	**7**	**8**	**19**	**13**	**2**	**6**	**12**	**20**	**121**
Caranx latus	.	1	.	1	.	.	1	.	1	.	1	4	9
Carcharhinus leucas	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**1**	**.**	**.**	**.**	**.**	**2**
Centropomus parallelus	**2**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**3**	**1**	**.**	**.**	**7**
Centropomus sp.	.	.	.	.	.	.	.	.	.	.	1	.	1
Centropomus undecimalis	**54**	**39**	**10**	**43**	**17**	**12**	**21**	**45**	**56**	**36**	**40**	**51**	**424**
Chaetodipterus faber	.	.	1	.	.	1	.	.	.	1	.	.	3
Chilomycterus schoepfii	.	.	.	3	2	3	3	1	.	.	.	1	13
Chilomycterus sp.	.	.	.	1	.	.	.	.	.	.	.	.	1
Chloroscombrus chrysurus	.	.	7	.	.	.	.	.	.	.	.	.	7
Citharichthys spilopterus	7	5	.	15	3	6	5	8	9	.	1	2	61
Clupeiformes sp.	.	.	.	.	.	.	.	.	.	.	1	.	1
Ctenogobius boleosoma	8	7	.	.	.	2	.	.	.	1	40	6	64

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=35	E=35	E=12	E=35	E=12	E=35	E=12	E=35	E=35	E=35	E=35	E=35	E=351
Ctenogobius pseudofasciatus	.	.	.	.	.	.	.	.	1	.	.	.	1
Ctenogobius shufeldti	.	.	.	.	.	.	.	.	1	.	.	.	1
Ctenogobius smaragdus	7	.	.	1	.	7	.	34	1	.	7	.	57
Ctenogobius spp.	.	.	.	1	.	.	.	.	.	.	1	.	2
Ctenogobius stigmaticus	.	.	.	1	.	.	.	.	.	.	.	.	1
Cynoscion complex	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**2**
Cynoscion nebulosus	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**
Diapterus auratus	172	606	980	610	393	248	108	358	242	296	924	912	5,849
Diapterus rhombeus	1	51	.	2	.	9	.	.	1	3	.	.	67
Diplodus holbrookii	.	.	.	11	.	.	.	.	.	.	.	.	11
Dormitator maculatus	.	1	.	.	.	.	.	26	.	1	1	.	29
Dorosoma petenense	.	.	.	.	.	.	.	.	.	.	4	.	4
Eleotris amblyopsis	.	.	.	.	.	1	.	1	.	.	.	.	2
Elops saurus	**1**	**43**	**253**	**15**	**13**	**4**	**1**	**2**	**9**	**32**	**33**	**72**	**478**
Elops smithi	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**2**
Enneacanthus gloriosus	.	.	.	.	.	.	.	.	.	1	.	.	1
Erotelis smaragdus	1	.	.	.	.	.	.	.	.	.	.	.	1
Eucinostomus argenteus	1	.	.	.	.	19	.	.	.	6	.	.	26
Eucinostomus gula	85	77	13	100	8	46	991	93	58	98	65	36	1,670
Eucinostomus harengulus	73	45	7	176	5	79	89	124	49	96	247	26	1,016

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=35	E=35	E=12	E=35	E=12	E=35	E=12	E=35	E=35	E=35	E=35	E=35	E=351
Eucinostomus jonesii	7	16	.	60	.	41	.	1	.	117	36	12	290
Eucinostomus melanopterus	.	1	.	1	.	7	.	2	7	6	11	1	36
Eucinostomus spp.	358	208	.	405	.	577	.	185	170	501	838	481	3,723
Eugerres plumieri	62	24	2	116	1	213	4	16	35	25	24	6	528
Evorthodus lyricus	.	1	.	.	.	7	.	5	12	1	2	.	28
Farfantepenaeus aztecus	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**2**
Farfantepenaeus duorarum	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**
***Farfantepenaeus* spp.**	**73**	**43**	**.**	**128**	**.**	**77**	**.**	**58**	**37**	**13**	**77**	**35**	**541**
Gambusia holbrooki	60	166	.	4	.	29	.	117	13	38	13	.	440
Gerreidae sp.	.	.	.	1	.	.	.	.	.	.	.	.	1
Gerres cinereus	68	24	18	43	19	10	22	41	12	15	7	23	302
Gobiesox strumosus	.	.	.	.	.	1	.	1	.	.	.	.	2
Gobiidae spp.	.	.	.	.	.	.	.	.	.	2	.	.	2
Gobiomorus dormitor	.	2	.	1	.	2	.	4	1	.	1	.	11
Gobionellus oceanicus	7	14	.	1	.	9	.	4	7	10	83	103	238
Gobiosoma bosc	7	17	.	4	.	5	.	5	2	.	.	5	45
Gobiosoma robustum	.	.	.	1	.	.	.	.	.	.	.	.	1
Gobiosoma spp.	11	8	.	16	.	36	.	11	2	7	3	22	116
Gymnothorax funebris	.	.	.	.	.	.	.	.	.	.	.	1	1
Gymnura lessae	.	1	.	.	.	.	.	.	.	.	.	.	1

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=35	E=35	E=12	E=35	E=12	E=35	E=12	E=35	E=35	E=35	E=35	E=35	E=351
Haemulon aurolineatum	**.**	**.**	**.**	**3**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**3**
Haemulon flavolineatum	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**
Haemulon parra	**9**	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**.**	**1**	**.**	**.**	**12**
Haemulon sciurus	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**
Harengula humeralis	.	.	.	2	.	.	.	.	.	1	5	29	37
Harengula jaguana	2,766	.	11	29	.	27	.	.	12	288	9	144	3,286
Hypanus sabinus	4	14	1	4	15	1	3	6	2	3	.	2	55
Hypanus say	.	5	4	7	12	.	9	4	14	2	6	4	67
Hyporhamphus sp.	.	.	.	1	.	.	.	.	.	.	.	.	1
Labidesthes vanhyningi	23	17	.	7	.	3	.	7	5	9	25	7	103
Lachnolaimus maximus	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**1**
Lactophrys trigonus	1	.	2	18	.	3	7	4	.	.	2	1	38
Lagodon rhomboides	.	18	1	19	1	28	620	4,968	11	30	1	2	5,699
Leiostomus xanthurus	**.**	**1**	**.**	**6**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**8**
Lepisosteus osseus	.	.	.	.	.	.	.	.	1	.	.	.	1
Lepisosteus platyrhincus	1	.	.	.	.	.	.	1	.	.	1	.	3
Lepomis gulosus	.	.	.	.	.	.	.	.	.	3	.	.	3
Lepomis macrochirus	3	19	.	.	.	.	.	2	14	18	3	3	62
Lepomis microlophus	.	3	.	.	.	.	.	.	.	2	.	1	6
Lepomis spp.	.	.	.	.	.	19	.	8	8	6	.	.	41

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=35	E=35	E=12	E=35	E=12	E=35	E=12	E=35	E=35	E=35	E=35	E=35	E=351
Litopenaeus setiferus	**2**	**1**	**.**	**2**	**.**	**52**	**.**	**.**	**2**	**4**	**.**	**1**	**64**
Lobotes surinamensis	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**1**	**.**	**1**	**.**	**3**
Lophogobius cyprinoides	12	25	.	10	.	87	.	103	21	4	7	9	278
Lupinoblennius nicholsi	.	.	.	1	.	.	.	.	.	1	.	1	3
Lutjanus analis	**1**	**2**	**4**	**9**	**14**	**9**	**11**	**9**	**1**	**24**	**8**	**2**	**94**
Lutjanus apodus	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**1**
Lutjanus cyanopterus	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**1**
Lutjanus griseus	**15**	**.**	**.**	**6**	**.**	**7**	**6**	**14**	**6**	**1**	**6**	**.**	**61**
Lutjanus jocu	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**2**	**3**
Lutjanus synagris	**1**	**.**	**.**	**1**	**10**	**11**	**3**	**.**	**3**	**.**	**.**	**1**	**30**
Mayaheros urophthalmus	3	13	.	1	.	1	.	26	7	1	1	2	55
Megalops atlanticus	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**1**	**.**	**.**	**2**
Menidia spp.	112	66	.	186	.	79	.	56	45	97	1,420	26	2,087
Menippe sp.	.	.	.	.	1	.	.	.	.	.	.	.	1
Menticirrhus americanus	**.**	**.**	**.**	**.**	**.**	**.**	**2**	**10**	**.**	**.**	**.**	**.**	**12**
Microgobius gulosus	13	15	.	22	.	50	.	71	23	49	40	27	310
Microgobius microlepis	.	.	.	.	.	1	.	.	.	2	4	.	7
Microgobius thalassinus	.	.	.	1	.	.	.	.	.	.	5	.	6
Microphis lineatus	1	.	.	1	.	.	.	1	.	.	1	1	5
Micropogonias undulatus	**15**	**17**	**6**	**34**	**25**	**2**	**84**	**25**	**10**	**5**	**17**	**36**	**276**

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=35	E=35	E=12	E=35	E=12	E=35	E=12	E=35	E=35	E=35	E=35	E=35	E=351
Mugil cephalus	**32**	**278**	**.**	**25**	**13**	**21**	**4**	**20**	**67**	**19**	**8**	**82**	**569**
Mugil curema	**73**	**491**	**64**	**221**	**41**	**39**	**26**	**36**	**108**	**19**	**55**	**574**	**1,747**
Mugil rubrioculus	**.**	**.**	**2**	**1**	**.**	**18**	**.**	**1**	**.**	**2**	**.**	**3**	**27**
Mugil spp.	.	.	.	.	.	.	.	.	2	2	.	1	5
Myliobatis freminvillii	.	2	.	.	.	.	.	.	.	.	.	.	2
Oligoplites saurus	5	.	8	.	1	3	.	2	16	27	21	5	88
Opisthonema oglinum	1	.	1,180	6	.	.	.	6	2	5	18	27	1,245
Opsanus tau	.	.	.	1	.	.	.	.	.	.	.	.	1
Oreochromis complex	2	1	.	.	.	4	.	1	.	1	1	1	11
Sarotherodon spp.	.	2	.	.	.	111	.	49	.	.	.	.	162
Orthopristis chrysoptera	.	.	.	2	.	1	127	2	1	.	.	.	133
Paralichthys albigutta	**.**	**.**	**.**	**1**	**.**	**.**	**2**	**.**	**.**	**.**	**.**	**.**	**3**
Paralichthys lethostigma	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**1**
Pelmatolapia mariae	1	1	.	2	.	.	.	.	.	2	6	.	12
Poecilia latipinna	.	.	.	.	.	.	.	.	.	3	.	.	3
Pogonias cromis	**.**	**3**	**.**	**3**	**.**	**1**	**49**	**3**	**4**	**4**	**5**	**8**	**80**
Pomatomus saltatrix	**.**	**1**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**4**	**6**	**11**
Portunus spp.	.	.	.	.	.	3	.	.	.	.	.	.	3
Prionotus tribulus	.	3	.	1	2	.	1	.	.	1	.	.	8
Pristis pectinata	.	.	.	.	.	.	.	1	.	.	.	.	1

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=35	E=35	E=12	E=35	E=12	E=35	E=12	E=35	E=35	E=35	E=35	E=35	E=351
Pterygoplichthys disjunctivus	.	2	.	.	.	1	.	.	1	.	1	.	5
Pterygoplichthys sp.	.	.	.	.	.	.	.	.	1	.	.	.	1
Sardinella aurita	.	.	.	.	.	.	.	.	.	.	1	.	1
Sciaenops ocellatus	**1**	**1**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**4**	**1**	**.**	**8**
Scomberomorus maculatus	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**1**	**1**	**3**
Scorpaena grandicornis	.	.	.	.	.	3	.	1	.	1	.	.	5
Scorpaena sp.	1	.	.	.	.	.	.	.	.	.	.	.	1
Selene vomer	15	14	14	17	8	3	9	.	4	6	14	24	128
Sparidae sp.	.	1	.	.	.	.	.	.	.	.	.	.	1
Sphoeroides nephelus	.	.	.	1	.	2	1	.	1	2	.	1	8
Sphoeroides spengleri	.	.	.	2	.	.	.	.	.	1	.	4	7
Sphoeroides spp.	.	.	.	3	.	.	.	.	.	.	.	.	3
Sphoeroides testudineus	71	34	40	30	49	52	47	18	19	54	23	36	473
Sphyraena barracuda	**26**	**7**	**3**	**14**	**8**	**18**	**10**	**35**	**24**	**28**	**37**	**85**	**295**
Sphyrna tiburo	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**.**	**3**	**.**	**.**	**3**
Stephanolepis hispida	.	.	.	.	.	1	.	.	.	.	1	1	3
Strongylura marina	.	.	.	.	.	.	.	.	.	1	2	1	4
Strongylura notata	8	.	.	.	1	.	3	1	1	15	1	16	46
Strongylura spp.	.	.	.	1	.	.	.	.	.	1	1	.	3
Strongylura timucu	.	1	.	1	.	.	.	.	1	2	.	.	5

Species	Month												Totals
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
	E=35	E=35	E=12	E=35	E=12	E=35	E=12	E=35	E=35	E=35	E=35	E=35	E=351
Symphurus plagiusa	1	.	.	.	.	.	1	.	.	.	.	.	2
Syngnathus louisianae	1	.	.	.	.	.	.	.	.	.	1	1	3
Syngnathus scovelli	.	.	.	1	.	3	.	1	.	1	.	1	7
Synodus foetens	.	.	.	8	.	.	.	.	.	4	.	3	15
Trachinotus carolinus	**47**	**.**	**3**	**.**	**.**	**.**	**.**	**.**	**.**	**1**	**.**	**.**	**51**
Trachinotus falcatus	**1**	**1**	**.**	**.**	**.**	**1**	**4**	**5**	**.**	**20**	**5**	**3**	**40**
Trichiurus lepturus	.	.	.	.	.	.	2	.	.	.	.	.	2
Trinectes maculatus	7	8	.	6	1	1	1	4	6	2	12	17	65
Tylosurus crocodilus	11	.	.	.	.	.	.	.	1	.	.	.	12
Totals	**11,478**	**7,794**	**2,717**	**2,951**	**848**	**2,440**	**2,632**	**6,887**	**1,316**	**2,251**	**4,640**	**11,067**	**57,021**

Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.29: Summary by gear and stratum of taxa collected during southern Indian River Lagoon stratified-random sampling, 2023.

Species	Gear and Strata				Totals
	21.3-m river seine		183-m haul seine		
	Over	Nonover	Over	Nonover	
	E=151	E=56	E=104	E=40	E=351
Acanthostracion quadricornis	.	.	.	2	2
Achirus lineatus	27	11	8	13	59
Aetobatus narinari	.	.	2	.	2
***Albula* spp.**	**1**	**.**	**19**	**3**	**23**
Anchoa cubana	.	36	.	.	36
Anchoa hepsetus	304	1	.	.	305
Anchoa lyolepis	43	1	.	.	44
Anchoa mitchilli	9,995	9,991	.	.	19,986
Anisotremus virginicus	.	.	1	.	1
Archosargus probatocephalus	**30**	**7**	**265**	**35**	**337**
Archosargus rhomboidalis	.	.	169	6	175
Ariopsis felis	28	4	386	180	598
Atherinomorus stipes	.	7	.	.	7
Bagre marinus	.	.	4	12	16
Bairdiella chrysoura	.	.	3	15	18
Bathygobius soporator	16	7	.	.	23
Brachygenys chrysargyreum	.	17	.	.	17
***Brevoortia* spp.**	**100**	**497**	**.**	**45**	**642**
Callinectes ornatus	2	14	10	3	29
Callinectes sapidus	**206**	**43**	**33**	**15**	**297**
Callinectes similis	7	.	9	80	96
Callinectes spp.	10	1	.	.	11
Caranx crysos	**1**	**.**	**7**	**6**	**14**
Caranx hippos	**3**	**1**	**67**	**50**	**121**
Caranx latus	2	.	7	.	9
Carcharhinus leucas	**.**	**.**	**1**	**1**	**2**

Species	Gear and Strata				Totals
	21.3-m river seine		183-m haul seine		
	Over	Nonover	Over	Nonover	
	E=151	E=56	E=104	E=40	E=351
Centropomus parallelus	**3**	**2**	**2**	**.**	**7**
Centropomus sp.	1	.	.	.	1
Centropomus undecimalis	**189**	**38**	**133**	**64**	**424**
Chaetodipterus faber	.	.	2	1	3
Chilomycterus schoepfii	.	.	12	1	13
Chilomycterus sp.	.	1	.	.	1
Chloroscombrus chrysurus	.	.	7	.	7
Citharichthys spilopterus	23	12	13	13	61
Clupeiformes sp.	.	1	.	.	1
Ctenogobius boleosoma	27	37	.	.	64
Ctenogobius pseudofasciatus	.	1	.	.	1
Ctenogobius shufeldti	.	1	.	.	1
Ctenogobius smaragdus	41	16	.	.	57
Ctenogobius spp.	1	1	.	.	2
Ctenogobius stigmaticus	.	1	.	.	1
Cynoscion complex	**.**	**.**	**2**	**.**	**2**
Cynoscion nebulosus	**.**	**.**	**1**	**.**	**1**
Diapterus auratus	908	641	3,493	807	5,849
Diapterus rhombeus	54	11	2	.	67
Diplodus holbrookii	1	10	.	.	11
Dormitator maculatus	28	1	.	.	29
Dorosoma petenense	.	.	.	4	4
Eleotris amblyopsis	2	.	.	.	2
Elops saurus	**7**	**5**	**390**	**76**	**478**
Elops smithi	**1**	**1**	**.**	**.**	**2**
Enneacanthus gloriosus	1	.	.	.	1
Erotelis smaragdus	.	1	.	.	1
Eucinostomus argenteus	7	19	.	.	26

Species	Gear and Strata				Totals
	21.3-m river seine		183-m haul seine		
	Over	Nonover	Over	Nonover	
	E=151	E=56	E=104	E=40	E=351
Eucinostomus gula	306	94	539	731	1,670
Eucinostomus harengulus	456	284	180	96	1,016
Eucinostomus jonesii	143	119	27	1	290
Eucinostomus melanopterus	1	7	19	9	36
Eucinostomus spp.	1,733	1,990	.	.	3,723
Eugerres plumieri	459	50	16	3	528
Evorthodus lyricus	17	11	.	.	28
Farfantepenaeus aztecus	**2**	**.**	**.**	**.**	**2**
Farfantepenaeus duorarum	**1**	**.**	**.**	**.**	**1**
***Farfantepenaeus* spp.**	**394**	**147**	**.**	**.**	**541**
Gambusia holbrooki	370	70	.	.	440
Gerreidae sp.	1	.	.	.	1
Gerres cinereus	68	6	189	39	302
Gobiesox strumosus	1	1	.	.	2
Gobiidae spp.	.	2	.	.	2
Gobiomorus dormitor	8	3	.	.	11
Gobionellus oceanicus	160	78	.	.	238
Gobiosoma bosc	40	5	.	.	45
Gobiosoma robustum	1	.	.	.	1
Gobiosoma spp.	96	20	.	.	116
Gymnothorax funebris	.	1	.	.	1
Gymnura lessae	.	.	1	.	1
Haemulon aurolineatum	**.**	**3**	**.**	**.**	**3**
Haemulon flavolineatum	**.**	**1**	**.**	**.**	**1**
Haemulon parra	**9**	**2**	**1**	**.**	**12**
Haemulon sciurus	**.**	**.**	**1**	**.**	**1**
Harengula humeralis	2	34	1	.	37
Harengula jaguana	2	36	3,164	84	3,286

Species	Gear and Strata				Totals
	21.3-m river seine		183-m haul seine		
	Over	Nonover	Over	Nonover	
	E=151	E=56	E=104	E=40	E=351
Hypanus sabinus	2	1	40	12	55
Hypanus say	.	.	45	22	67
Hyporhamphus sp.	.	1	.	.	1
Labidesthes vanhyningi	85	18	.	.	103
Lachnolaimus maximus	**.**	**.**	**1**	**.**	**1**
Lactophrys trigonus	.	.	36	2	38
Lagodon rhomboides	24	1	511	5,163	5,699
Leiostomus xanthurus	**4**	**2**	**1**	**1**	**8**
Lepisosteus osseus	1	.	.	.	1
Lepisosteus platyrhincus	3	.	.	.	3
Lepomis gulosus	3	.	.	.	3
Lepomis macrochirus	46	16	.	.	62
Lepomis microlophus	3	3	.	.	6
Lepomis spp.	40	1	.	.	41
Litopenaeus setiferus	**49**	**15**	**.**	**.**	**64**
Lobotes surinamensis	**2**	**.**	**1**	**.**	**3**
Lophogobius cyprinoides	213	65	.	.	278
Lupinoblennius nicholsi	3	.	.	.	3
Lutjanus analis	**1**	**.**	**85**	**8**	**94**
Lutjanus apodus	**.**	**1**	**.**	**.**	**1**
Lutjanus cyanopterus	**1**	**.**	**.**	**.**	**1**
Lutjanus griseus	**24**	**9**	**23**	**5**	**61**
Lutjanus jocu	**.**	**3**	**.**	**.**	**3**
Lutjanus synagris	**1**	**8**	**21**	**.**	**30**
Mayaheros urophthalmus	43	11	1	.	55
Megalops atlanticus	**.**	**.**	**2**	**.**	**2**
Menidia spp.	510	1,577	.	.	2,087
Menippe sp.	.	.	1	.	1

Species	Gear and Strata				Totals
	21.3-m river seine		183-m haul seine		
	Over	Nonover	Over	Nonover	
	E=151	E=56	E=104	E=40	E=351
Menticirrhus americanus	**.**	**.**	**10**	**2**	**12**
Microgobius gulosus	237	73	.	.	310
Microgobius microlepis	.	7	.	.	7
Microgobius thalassinus	.	6	.	.	6
Microphis lineatus	4	1	.	.	5
Micropogonias undulatus	**23**	**19**	**79**	**155**	**276**
Mugil cephalus	**246**	**59**	**184**	**80**	**569**
Mugil curema	**365**	**152**	**903**	**327**	**1,747**
Mugil rubrioculus	**19**	**6**	**1**	**1**	**27**
Mugil spp.	1	4	.	.	5
Myliobatis freminvillii	.	.	2	.	2
Oligoplites saurus	2	1	50	35	88
Opisthonema oglinum	7	5	1,226	7	1,245
Opsanus tau	.	.	1	.	1
Oreochromis complex	8	3	.	.	11
Sarotherodon spp.	161	1	.	.	162
Orthopristis chrysoptera	1	1	130	1	133
Paralichthys albigutta	**.**	**1**	**2**	**.**	**3**
Paralichthys lethostigma	**1**	**.**	**.**	**.**	**1**
Pelmatolapia mariae	4	8	.	.	12
Poecilia latipinna	3	.	.	.	3
Pogonias cromis	**1**	**.**	**65**	**14**	**80**
Pomatomus saltatrix	**.**	**.**	**10**	**1**	**11**
Portunus spp.	.	1	.	2	3
Prionotus tribulus	1	.	6	1	8
Pristis pectinata	.	.	.	1	1
Pterygoplichthys disjunctivus	5	.	.	.	5
Pterygoplichthys sp.	1	.	.	.	1

Species	Gear and Strata				Totals
	21.3-m river seine		183-m haul seine		
	Over	Nonover	Over	Nonover	
	E=151	E=56	E=104	E=40	E=351
Sardinella aurita	.	.	1	.	1
Sciaenops ocellatus	**5**	**1**	**2**	**.**	**8**
Scomberomorus maculatus	**.**	**.**	**2**	**1**	**3**
Scorpaena grandicornis	.	.	5	.	5
Scorpaena sp.	1	.	.	.	1
Selene vomer	.	.	104	24	128
Sparidae sp.	1	.	.	.	1
Sphoeroides nephelus	1	1	5	1	8
Sphoeroides spengleri	.	3	4	.	7
Sphoeroides spp.	.	3	.	.	3
Sphoeroides testudineus	90	36	235	112	473
Sphyraena barracuda	**23**	**9**	**252**	**11**	**295**
Sphyrna tiburo	**.**	**.**	**3**	**.**	**3**
Stephanolepis hispida	1	1	.	1	3
Strongylura marina	1	.	3	.	4
Strongylura notata	3	1	37	5	46
Strongylura spp.	3	.	.	.	3
Strongylura timucu	4	.	1	.	5
Symphurus plagiusa	.	1	.	1	2
Syngnathus louisianae	1	2	.	.	3
Syngnathus scovelli	3	4	.	.	7
Synodus foetens	5	6	4	.	15
Trachinotus carolinus	**.**	**.**	**50**	**1**	**51**
Trachinotus falcatus	**.**	**3**	**9**	**28**	**40**
Trichiurus lepturus	.	.	.	2	2
Trinectes maculatus	53	4	7	1	65
Tylosurus crocodilus	.	.	12	.	12
Totals	**18,682**	**16,557**	**13,359**	**8,423**	**57,021**

Species	Gear and Strata				Totals
	21.3-m river seine		183-m haul seine		
	Over	Nonover	Over	Nonover	
	E=151	E=56	E=104	E=40	E=351

Sampling with 21.3-m river seine was not stratified. Sampling with 183-m haul seine was stratified by the presence or absence of overhanging vegetation (’Over’ or ’Nonover’). Effort, or the total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

Table A.30: Summary by zone of taxa collected during southern Indian River Lagoon stratified-random sampling, 2023.

Species	Zone				Totals
	I	J	L	T	
	E=48	E=48	E=45	E=210	E=351
Acanthostracion quadricornis	.	2	.	.	2
Achirus lineatus	7	2	12	38	59
Aetobatus narinari	.	2	.	.	2
***Albula* spp.**	**2**	**20**	**1**	**.**	**23**
Anchoa cubana	.	.	.	36	36
Anchoa hepsetus	.	.	300	5	305
Anchoa lyolepis	.	.	43	1	44
Anchoa mitchilli	.	.	4,209	15,777	19,986
Anisotremus virginicus	1	.	.	.	1
Archosargus probatocephalus	**103**	**53**	**7**	**174**	**337**
Archosargus rhomboidalis	155	20	.	.	175
Ariopsis felis	191	197	29	181	598
Atherinomorus stipes	.	.	7	.	7
Bagre marinus	4	.	.	12	16
Bairdiella chrysoura	5	.	.	13	18
Bathygobius soporator	.	.	18	5	23
Brachygenys chrysargyreum	.	.	17	.	17
***Brevoortia* spp.**	**5**	**11**	**1**	**625**	**642**
Callinectes ornatus	1	12	.	16	29
Callinectes sapidus	**12**	**11**	**49**	**225**	**297**
Callinectes similis	4	83	5	4	96
Callinectes spp.	.	.	7	4	11
Caranx crysos	**.**	**10**	**1**	**3**	**14**
Caranx hippos	**48**	**36**	**1**	**36**	**121**
Caranx latus	1	5	.	3	9
Carcharhinus leucas	**.**	**1**	**.**	**1**	**2**
Centropomus parallelus	**.**	**.**	**.**	**7**	**7**

Species	Zone				Totals
	I	J	L	T	
	E=48	E=48	E=45	E=210	E=351
Centropomus sp.	.	.	1	.	1
Centropomus undecimalis	**96**	**60**	**22**	**246**	**424**
Chaetodipterus faber	1	1	.	1	3
Chilomycterus schoepfii	5	7	.	1	13
Chilomycterus sp.	.	.	.	1	1
Chloroscombrus chrysurus	7	.	.	.	7
Citharichthys spilopterus	10	3	11	37	61
Clupeiformes sp.	.	.	.	1	1
Ctenogobius boleosoma	.	.	42	22	64
Ctenogobius pseudofasciatus	.	.	1	.	1
Ctenogobius shufeldti	.	.	1	.	1
Ctenogobius smaragdus	.	.	52	5	57
Ctenogobius spp.	.	.	1	1	2
Ctenogobius stigmaticus	.	.	.	1	1
Cynoscion complex	**1**	**1**	**.**	**.**	**2**
Cynoscion nebulosus	**.**	**1**	**.**	**.**	**1**
Diapterus auratus	2,269	1,483	730	1,367	5,849
Diapterus rhombeus	2	.	60	5	67
Diplodus holbrookii	.	.	11	.	11
Dormitator maculatus	.	.	.	29	29
Dorosoma petenense	.	.	.	4	4
Eleotris amblyopsis	.	.	.	2	2
Elops saurus	**300**	**122**	**.**	**56**	**478**
Elops smithi	**.**	**.**	**.**	**2**	**2**
Enneacanthus gloriosus	.	.	.	1	1
Erotelis smaragdus	.	.	1	.	1
Eucinostomus argenteus	.	.	7	19	26
Eucinostomus gula	1,126	143	281	120	1,670
Eucinostomus harengulus	162	100	175	579	1,016

Species	Zone				Totals
	I	J	L	T	
	E=48	E=48	E=45	E=210	E=351
Eucinostomus jonesii	.	27	175	88	290
Eucinostomus melanopterus	7	8	1	20	36
Eucinostomus spp.	.	.	1,745	1,978	3,723
Eugerres plumieri	1	4	262	261	528
Evorthodus lyricus	.	.	12	16	28
Farfantepenaeus aztecus	**.**	**.**	**.**	**2**	**2**
Farfantepenaeus duorarum	**.**	**.**	**.**	**1**	**1**
***Farfantepenaeus* spp.**	**.**	**.**	**219**	**322**	**541**
Gambusia holbrooki	.	.	3	437	440
Gerreidae sp.	.	.	1	.	1
Gerres cinereus	80	140	43	39	302
Gobiesox strumosus	.	.	.	2	2
Gobiidae spp.	.	.	2	.	2
Gobiomorus dormitor	.	.	2	9	11
Gobionellus oceanicus	.	.	168	70	238
Gobiosoma bosc	.	.	2	43	45
Gobiosoma robustum	.	.	.	1	1
Gobiosoma spp.	.	.	22	94	116
Gymnothorax funebris	.	.	.	1	1
Gymnura lessae	.	1	.	.	1
Haemulon aurolineatum	**.**	**.**	**3**	**.**	**3**
Haemulon flavolineatum	**.**	**.**	**1**	**.**	**1**
Haemulon parra	**1**	**.**	**11**	**.**	**12**
Haemulon sciurus	**.**	**1**	**.**	**.**	**1**
Harengula humeralis	1	.	2	34	37
Harengula jaguana	3,085	153	28	20	3,286
Hypanus sabinus	20	4	1	30	55
Hypanus say	27	34	.	6	67
Hyporhamphus sp.	.	.	.	1	1

Species	Zone				Totals
	I	J	L	T	
	E=48	E=48	E=45	E=210	E=351
Labidesthes vanhyningi	.	.	.	103	103
Lachnolaimus maximus	**1**	**.**	**.**	**.**	**1**
Lactophrys trigonus	.	38	.	.	38
Lagodon rhomboides	5,596	60	1	42	5,699
Leiostomus xanthurus	**1**	**1**	**.**	**6**	**8**
Lepisosteus osseus	.	.	.	1	1
Lepisosteus platyrhincus	.	.	.	3	3
Lepomis gulosus	.	.	3	.	3
Lepomis macrochirus	.	.	12	50	62
Lepomis microlophus	.	.	2	4	6
Lepomis spp.	.	.	3	38	41
Litopenaeus setiferus	**.**	**.**	**11**	**53**	**64**
Lobotes surinamensis	**.**	**.**	**.**	**3**	**3**
Lophogobius cyprinoides	.	.	144	134	278
Lupinoblennius nicholsi	.	.	3	.	3
Lutjanus analis	**50**	**42**	**1**	**1**	**94**
Lutjanus apodus	**.**	**.**	**.**	**1**	**1**
Lutjanus cyanopterus	**.**	**.**	**.**	**1**	**1**
Lutjanus griseus	**13**	**9**	**22**	**17**	**61**
Lutjanus jocu	**.**	**.**	**1**	**2**	**3**
Lutjanus synagris	**6**	**15**	**7**	**2**	**30**
Mayaheros urophthalmus	.	.	1	54	55
Megalops atlanticus	**.**	**1**	**.**	**1**	**2**
Menidia spp.	.	.	156	1,931	2,087
Menippe sp.	.	1	.	.	1
Menticirrhus americanus	**10**	**.**	**.**	**2**	**12**
Microgobius gulosus	.	.	57	253	310
Microgobius microlepis	.	.	7	.	7
Microgobius thalassinus	.	.	5	1	6

Species	Zone				Totals
	I	J	L	T	
	E=48	E=48	E=45	E=210	E=351
Microphis lineatus	.	.	1	4	5
Micropogonias undulatus	**36**	**51**	**8**	**181**	**276**
Mugil cephalus	**99**	**58**	**236**	**176**	**569**
Mugil curema	**516**	**575**	**358**	**298**	**1,747**
Mugil rubrioculus	**.**	**1**	**3**	**23**	**27**
Mugil spp.	.	.	2	3	5
Myliobatis freminvillii	.	2	.	.	2
Oligoplites saurus	32	53	2	1	88
Opisthonema oglinum	1,215	18	7	5	1,245
Opsanus tau	1	.	.	.	1
Oreochromis complex	.	.	1	10	11
Sarotherodon spp.	.	.	1	161	162
Orthopristis chrysoptera	130	.	1	2	133
Paralichthys albigutta	**2**	**.**	**.**	**1**	**3**
Paralichthys lethostigma	**.**	**.**	**.**	**1**	**1**
Pelmatolapia mariae	.	.	1	11	12
Poecilia latipinna	.	.	.	3	3
Pogonias cromis	**69**	**9**	**.**	**2**	**80**
Pomatomus saltatrix	**2**	**4**	**.**	**5**	**11**
Portunus spp.	2	.	.	1	3
Prionotus tribulus	2	5	.	1	8
Pristis pectinata	.	.	.	1	1
Pterygoplichthys disjunctivus	.	.	.	5	5
Pterygoplichthys sp.	.	.	.	1	1
Sardinella aurita	.	1	.	.	1
Sciaenops ocellatus	**2**	**.**	**3**	**3**	**8**
Scomberomorus maculatus	**.**	**2**	**.**	**1**	**3**
Scorpaena grandicornis	.	5	.	.	5
Scorpaena sp.	.	.	1	.	1

Species	Zone				Totals
	I	J	L	T	
	E=48	E=48	E=45	E=210	E=351
Selene vomer	25	84	.	19	128
Sparidae sp.	.	.	.	1	1
Sphoeroides nephelus	1	5	2	.	8
Sphoeroides spengleri	1	3	1	2	7
Sphoeroides spp.	.	.	.	3	3
Sphoeroides testudineus	187	67	95	124	473
Sphyraena barracuda	**74**	**181**	**26**	**14**	**295**
Sphyrna tiburo	**3**	**.**	**.**	**.**	**3**
Stephanolepis hispida	1	.	2	.	3
Strongylura marina	2	.	.	2	4
Strongylura notata	27	15	.	4	46
Strongylura spp.	.	.	.	3	3
Strongylura timucu	1	.	4	.	5
Symphurus plagiusa	.	.	.	2	2
Syngnathus louisianae	.	.	.	3	3
Syngnathus scovelli	.	.	3	4	7
Synodus foetens	2	2	3	8	15
Trachinotus carolinus	**49**	**1**	**.**	**1**	**51**
Trachinotus falcatus	**6**	**27**	**.**	**7**	**40**
Trichiurus lepturus	.	.	.	2	2
Trinectes maculatus	.	2	3	60	65
Tylosurus crocodilus	1	11	.	.	12
Totals	**15,905**	**4,107**	**10,006**	**27,003**	**57,021**

Zones I and J were located in the southern Indian River Lagoon, and Zone L and T encompassed the St. Lucie and Loxahatchee rivers, respectively. Effort, or the total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Selected taxa are highlighted in bold.

B Fisheries-Independent Monitoring Polyhaline Seagrass Sampling Appendix Tables

Table B.1: Summary of all species collected in 6.1-m otter trawl polyhaline seagrass sampling in all estuaries in June-November 2023.

Species	6.1-m otter trawl							Total
	SA	CB	SR	AP	BB	TB	CH	
	E=72	E=54	E=48	E=96	E=180	E=144	E=120	E=714
Acanthostracion quadricornis	56	3	52	21	79	161	71	443
Achirus lineatus	34	12	27	2	6	11	10	102
Aluterus schoepfii	8	.	7	9	27	19	31	101
Aluterus sp.	.	.	.	.	.	1	.	1
Anarchopterus criniger	.	.	2	5	59	14	114	194
Anchoa cubana	.	.	.	3	.	.	.	3
Anchoa hepsetus	1	1	16	157	2	.	.	177
Anchoa lyolepis	.	.	.	3	.	.	.	3
Anchoa mitchilli	78	177	68	975	29	92	50	1,469
Anchoa spp.	.	.	4	498	.	.	.	502
Ancylopsetta quadrocellata	.	.	.	3	.	.	.	3
Archosargus probatocephalus	**.**	**.**	**7**	**5**	**.**	**97**	**100**	**209**
Archosargus rhomboidalis	.	.	.	.	.	.	3	3
Argopecten irradians	56	.	.	41	729	11	.	837
Ariopsis felis	5	8	1	51	3	14	9	91
Astroscopus y-graecum	.	1	.	.	1	.	.	2
Bairdiella chrysoura	393	1,508	2,026	3,784	1,401	1,745	1,265	12,122
Blenniidae sp.	.	1	.	.	.	.	.	1
Brevoortia spp.	.	.	.	2	.	.	.	2
Calamus arctifrons	.	.	.	12	99	4	2	117

Species	6.1-m otter trawl							Total
	SA	CB	SR	AP	BB	TB	CH	
	E=72	E=54	E=48	E=96	E=180	E=144	E=120	E=714
Calamus bajonado	.	.	.	.	.	4	9	13
Calamus penna	.	.	.	.	.	8	14	22
Calamus proridens	.	.	.	.	.	3	23	26
Calamus spp.	.	.	.	1	4	.	.	5
Callinectes ornatus	.	.	.	.	.	16	25	41
Callinectes sapidus	108	401	336	466	14	55	98	1,478
Callinectes similis	.	2	.	1	.	.	.	3
Centropristis philadelphica	1	.	.	.	.	.	.	1
Centropristis striata	**.**	**.**	**.**	**249**	**1,341**	**2**	**1**	**1,593**
Chaetodipterus faber	.	.	3	7	3	6	52	71
Chasmodes saburrae	4	16	70	15	8	12	55	180
Chilomycterus schoepfii	94	88	68	184	170	562	614	1,780
Chloroscombrus chrysurus	.	.	.	2	2	1	1	6
Citharichthys macrops	1	1	.	6	1	.	.	9
Citharichthys spilopterus	.	6	.	.	.	.	.	6
Clupeiformes spp.	.	2	.	.	.	.	.	2
Cosmocampus albirostris	3	.	.	.	.	.	.	3
Ctenogobius boleosoma	1	.	1	8	.	.	.	10
Cynoscion arenarius	.	.	.	58	.	.	.	58
Cynoscion nebulosus	**98**	**431**	**385**	**379**	**108**	**314**	**121**	**1,836**
Diodon holocanthus	.	.	.	.	.	1	.	1
Diplectrum bivittatum	.	.	.	1	.	.	.	1
Diplectrum formosum	2	.	.	38	39	4	34	117
Diplectrum sp.	.	.	.	1	.	.	.	1
Diplodus holbrookii	1	.	.	2	4,426	31	.	4,460
Elops saurus	.	.	.	1	.	.	.	1
Epinephelus morio	**.**	**.**	**.**	**.**	**.**	**7**	**79**	**86**
Erotelis smaragdus	.	2	.	.	.	.	.	2
Etropus crossotus	.	.	.	58	5	.	4	67

Species	6.1-m otter trawl							Total
	SA	CB	SR	AP	BB	TB	CH	
	E=72	E=54	E=48	E=96	E=180	E=144	E=120	E=714
Etropus cyclosquamus	.	.	.	2	.	.	.	2
Eucinostomus argenteus	9	21	27	18	.	.	.	75
Eucinostomus gula	86	58	14	62	177	2,412	3,423	6,232
Eucinostomus harengulus	5	27	2	13	17	25	13	102
Eucinostomus spp.	2,667	1,495	281	441	352	6,741	6,751	18,728
Eugerres plumieri	.	.	.	.	.	2	.	2
Farfantepenaeus aztecus	.	8	2	5	.	.	.	15
Farfantepenaeus duorarum	42	72	123	111	113	740	705	1,906
Farfantepenaeus spp.	93	401	624	675	100	.	.	1,893
Floridichthys carpio	.	.	.	.	.	6	.	6
Ginglymostoma cirratum	.	.	.	.	.	.	1	1
Gobiesox strumosus	.	.	.	.	2	.	.	2
Gobiidae sp.	.	.	.	1	.	.	.	1
Gobionellus oceanicus	.	.	1	.	.	.	.	1
Gobiosoma longipala	.	.	.	.	.	1	.	1
Gobiosoma robustum	9	32	12	29	4	93	415	594
Gobiosoma spp.	1	41	22	26	.	54	206	350
Gymnothorax saxicola	.	.	.	.	2	.	.	2
Haemulon aurolineatum	4	.	.	.	6	16	3	29
Haemulon plumierii	**.**	**.**	**.**	**.**	**422**	**337**	**704**	**1,463**
Halichoeres bivittatus	9	.	.	2	2	.	.	13
Harengula jaguana	.	9	359	4	26	22	84	504
Hemicaranx amblyrhynchus	.	.	.	1	.	.	.	1
Hippocampus erectus	8	2	1	1	.	26	32	70
Hippocampus sp.	.	.	.	1	.	.	.	1
Hippocampus zosterae	3	.	3	3	1	18	38	66
Hypanus sabinus	11	8	11	33	3	13	1	80
Hypanus say	3	.	1	10	.	3	.	17
Hypsoblennius hentz	.	.	3	11	.	2	14	30

Species	6.1-m otter trawl							Total
	SA	CB	SR	AP	BB	TB	CH	
	E=72	E=54	E=48	E=96	E=180	E=144	E=120	E=714
Labridae sp. (parrotfishes)	.	1	.	.	.	.	.	1
Lachnolaimus maximus	**.**	**.**	**.**	**1**	**85**	**.**	**.**	**86**
Lactophrys trigonus	4	.	.	.	.	.	.	4
Lagodon rhomboides	13,383	4,175	20,468	8,885	13,257	24,168	10,585	94,921
Larimus fasciatus	.	.	.	9	.	.	.	9
Leiostomus xanthurus	36	126	23	63	5	3	.	256
Lepisosteus osseus	.	.	.	.	1	.	.	1
Litopenaeus setiferus	.	1	.	2	.	.	.	3
Lucania parva	2	.	.	.	7	1,000	1,860	2,869
Lutjanus griseus	**31**	**107**	**8**	**25**	**6**	**63**	**103**	**343**
Lutjanus synagris	**30**	**9**	**.**	**73**	**120**	**258**	**555**	**1,045**
Menidia spp.	.	.	1	66	.	.	.	67
Menippe spp.	.	.	.	30	9	29	78	146
Menticirrhus americanus	.	1	.	29	.	.	.	30
Menticirrhus saxatilis	.	1	.	.	1	.	.	2
Microgobius gulosus	7	96	39	14	.	13	6	175
Micropogonias undulatus	.	1	.	7	.	.	.	8
Monacanthidae spp.	.	.	.	3	.	.	.	3
Monacanthus ciliatus	.	.	.	83	814	42	177	1,116
Mycteroperca bonaci	.	.	.	.	.	1	2	3
Mycteroperca microlepis	**2**	**.**	**1**	**34**	**13**	**160**	**118**	**328**
Narcine bancroftii	.	.	.	2	.	.	.	2
Nicholsina usta	86	14	.	1	3	24	47	175
Ocyurus chrysurus	.	.	.	.	.	5	23	28
Odontoscion dentex	.	.	.	.	.	1	.	1
Ogcocephalus cubifrons	.	.	.	5	1	.	1	7
Oligoplites saurus	.	.	.	.	.	1	1	2
Ophidion holbrookii	.	.	.	.	1	.	.	1
Opisthonema oglinum	.	.	.	.	2	1	5	8

Species	6.1-m otter trawl							Total
	SA	CB	SR	AP	BB	TB	CH	
	E=72	E=54	E=48	E=96	E=180	E=144	E=120	E=714
Opistognathus robinsi	1	.	.	.	.	.	.	1
Opsanus beta	125	33	105	181	354	184	446	1,428
Opsanus beta (red morph)	.	.	.	.	1	.	.	1
Orthopristis chrysoptera	2,440	610	2,091	5,779	1,618	624	242	13,404
Parablennius marmoreus	.	.	.	1	.	.	.	1
Paraclinus fasciatus	.	.	.	.	70	.	.	70
Paraclinus marmoratus	.	.	.	.	40	25	12	77
Paralichthys albigutta	252	186	141	253	102	108	25	1,067
Paralichthys lethostigma	.	.	.	1	2	.	.	3
Penaeidae sp.	1	.	.	.	.	.	.	1
Peprilus burti	.	.	.	.	1	.	.	1
Portunus spp.	22	5	.	54	17	87	222	407
Prionotus scitulus	17	8	11	29	21	43	60	189
Prionotus tribulus	3	13	.	2	1	1	.	20
Rimapenaeus constrictus	.	1	.	1	.	.	.	2
Rimapenaeus spp.	4	3	2	24	.	.	3	36
Rostroraja texana	.	.	.	.	1	.	.	1
Sarotherodon melanotheron	.	.	.	.	.	6	.	6
Sciaenidae spp.	.	.	.	2	.	.	.	2
Sciaenops ocellatus	**.**	**18**	**2**	**9**	**.**	**1**	**.**	**30**
Scorpaena brasiliensis	24	.	.	3	4	3	5	39
Scorpaena calcarata	.	.	.	.	1	.	.	1
Selene vomer	.	.	.	2	2	.	.	4
Serraniculus pumilio	.	.	.	3	3	.	4	10
Serranus subligarius	1	.	.	4	1	2	12	20
Sicyonia laevigata	.	.	.	.	.	2	4	6
Sicyonia parri	2	.	.	.	.	.	.	2
Sicyonia sp.	1	.	.	.	.	.	.	1
Sicyonia typica	2	.	.	.	.	.	.	2

Species	6.1-m otter trawl							Total
	SA	CB	SR	AP	BB	TB	CH	
	E=72	E=54	E=48	E=96	E=180	E=144	E=120	E=714
Sphoeroides nephelus	11	7	22	68	54	91	243	496
Sphoeroides parvus	2	4	2	.	.	.	.	8
Sphoeroides spengleri	.	.	.	10	12	56	55	133
Sphoeroides sp.	1	.	.	.	.	.	.	1
Sphyraena borealis	12	2	1	.	3	1	2	21
Stellifer lanceolatus	.	.	.	1	.	.	.	1
Stephanolepis hispida	116	20	9	379	232	649	324	1,729
Stomolophus meleagris	.	.	.	5	.	.	.	5
Syacium papillosum	1	.	.	.	.	.	.	1
Symphurus plagiusa	1	10	4	16	6	3	2	42
Syngnathus floridae	230	30	388	395	1,378	469	390	3,280
Syngnathus louisianae	8	29	14	110	4	48	55	268
Syngnathus scovelli	170	135	236	276	16	192	702	1,727
Syngnathus springeri	.	.	.	.	1	.	.	1
Synodus foetens	41	40	17	66	34	107	82	387
Synodus intermedius	.	.	.	.	2	.	.	2
Tigrigobius macrodon	.	.	.	.	2	.	.	2
Trinectes maculatus	.	67	.	80	5	2	2	156
Xiphopenaeus kroyeri	.	.	.	4	.	.	.	4
Total	**20,963**	**10,587**	**28,144**	**25,587**	**28,096**	**42,179**	**31,628**	**187,184**

Effort, or total number of hauls, is labeled ’E’. Taxa are arranged alphabetically. Species of interest are highlighted in bold.