Fisheries-Independent Monitoring Program
2017 Annual Data Summary Report

Compiled by the Fisheries-Independent Monitoring Program Staff
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Overview

This report provides a summary of the data collected in 2017 by the Florida Fish and Wildlife Conservation Commission (FWC) Fish and Wildlife Research Institute’s (FWRI) Fisheries-Independent Monitoring (FIM) program. Monitoring was conducted monthly following a stratified-random sampling (SRS) design in Tampa Bay, Charlotte Harbor, the northern Indian River Lagoon, Cedar Key, the southern Indian River Lagoon, Apalachicola Bay, and northeast Florida. Gears used for routine monitoring in the various areas included 21.3-m seines, 6.1-m otter trawls, and 183-m haul seines (Table OV17-01).

There were 1,867,596 animals collected in 7,136 samples from all study areas (Figure OV17-01). The most samples were collected with 21.3-m seines (n=3,920), followed by 6.1-m otter trawls (n=1,800), and 183-m haul seines (n=1,416). Total sampling effort in the study areas ranged from 420 hauls made in southern Indian River Lagoon to 1,476 hauls made in Charlotte Harbor (Table OV17-02). The total number of animals collected ranged from 69,563 in southern Indian River Lagoon to 627,693 in Tampa Bay. The majority of animals were collected in 21.3-m seines (n=1,362,005; 72.9% of the total catch).

Small fishes such as Anchoa mitchilli, Lagodon rhomboides, Eucinostomus spp., and seasonal recruits such as Leiostomus xanthurus, Mugil cephalus, Mugil curema, and Micropogonias undulatus dominated samples. Recreationally and commercially important animals (i.e., Selected Taxa; see Table FIM17-04) accounted for 9.1% (n=169,333) of the overall catch and comprised between 2.7% (Tampa Bay) and 26.5% (northeast Florida) of the total SRS catches from each study area. Selected Taxa were among the 10 most abundant taxa in some areas: Farfantepenaeus duorarum in Charlotte Harbor; M. curema and M. cephalus in the northern Indian River Lagoon; M. cephalus and L. xanthurus in Cedar Key; M. curema in the southern Indian River Lagoon; M. undulatus, Cynoscion arenarius, Litopenaeus setiferus, and L. xanthurus in Apalachicola Bay; and L. setiferus, M. undulatus, L. xanthurus, and M. cephalus in northeast Florida (Tables OV17-03 and –04).
A total of 2,049 fish and select invertebrates were culled for fish health analyses of gross external abnormalities (including external parasites). Numbers of reported abnormalities from each study area ranged from one (Cedar Key) to 1,880 (northern Indian River Lagoon; see Fish Health section).

Species profiles, including indices of young-of-the-year relative abundance, were generated for many species of commercial, recreational, or ecological importance: *Sciaenops ocellatus* (Red Drum), *Cynoscion nebulosus* (Spotted Seatrout), *Archosargus probatocephalus* (Sheepshead), *M. cephalus* (Striped Mullet), *L. rhomboides* (Pinfish), *Centropomus undecimalis* (Common Snook), and *Callinectes sapidus* (Blue Crab; see Species Profile section).
Summary of 2017 FIM program catch and effort data. 'Samples' are the total number of deployments by gear, and 'Animals' are the total number of animals collected by each sampling method.

Figure OV17-01. Summary of 2017 FIM program catch and effort data. 'Samples' are the total number of deployments by gear, and 'Animals' are the total number of animals collected by each sampling method.
Table OV17-01. Gear usage by field laboratory for FIM program stratified-random sampling, 2017.

<table>
<thead>
<tr>
<th>Field Lab</th>
<th>21.3-m Seines (Bay)</th>
<th>21.3-m Seines (River)</th>
<th>183-m Haul Seines</th>
<th>6.1-m Otter Trawls</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tampa Bay</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Charlotte Harbor</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>N. Indian River</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Cedar Key</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>S. Indian River</td>
<td>--</td>
<td>X</td>
<td>X</td>
<td>--</td>
</tr>
<tr>
<td>Apalachicola</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Northeast Florida</td>
<td>--</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
Table OV17-02. Summary of catch and effort data by area for FIM program stratified-random sampling, 2017. ‘Hauls’ are the total number of net deployments by each gear, and ‘Animals’ are the total number of animals collected by each sampling method.

<table>
<thead>
<tr>
<th>Gear</th>
<th>Tampa Bay</th>
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<tr>
<td></td>
<td>Hauls</td>
<td>Animals</td>
<td>Hauls</td>
<td>Animals</td>
</tr>
<tr>
<td>21.3-m seine</td>
<td>840</td>
<td>515,013</td>
<td>912</td>
<td>254,538</td>
</tr>
<tr>
<td>183-m haul seine</td>
<td>240</td>
<td>48,418</td>
<td>204</td>
<td>43,872</td>
</tr>
<tr>
<td>6.1-m otter trawl</td>
<td>348</td>
<td>64,262</td>
<td>360</td>
<td>64,985</td>
</tr>
<tr>
<td>Totals</td>
<td>1,428</td>
<td>627,693</td>
<td>1,476</td>
<td>363,395</td>
</tr>
</tbody>
</table>

| Gear                  | N. Indian River Lagoon |            | Cedar Key |            |
|                       | Hauls     | Animals    | Hauls     | Animals    |
| 21.3-m seine          | 500       | 281,715    | 420       | 55,052     |
| 183-m haul seine      | 228       | 42,188     | 192       | 23,271     |
| 6.1-m otter trawl     | 96        | 13,380     | 180       | 14,223     |
| Totals                | 824       | 337,283    | 792       | 92,546     |

| Gear                  | S. Indian River Lagoon |            | Apalachicola Bay |            |
|                       | Hauls     | Animals    | Hauls            | Animals    |
| 21.3-m seine          | 276       | 54,386     | 396              | 61,106     |
| 183-m haul seine      | 144       | 15,177     | 216              | 26,713     |
| 6.1-m otter trawl     | .         | .          | 228              | 85,217     |
| Totals                | 420       | 69,563     | 840              | 173,036    |

| Gear                  | Northeast Florida |            |
|                       | Hauls     | Animals    |
| 21.3-m seine          | 576       | 140,195    |
| 183-m haul seine      | 192       | 5,986      |
| 6.1-m otter trawl     | 588       | 57,899     |
| Totals                | 1,356     | 204,080    |
Table OV17-03. Top 10 numerically dominant taxa collected in FIM program stratified-random sample areas, 2017.

<table>
<thead>
<tr>
<th></th>
<th>Tampa Bay</th>
<th>Charlotte Harbor</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scientific Name</strong></td>
<td><strong>Number</strong></td>
<td><strong>Scientific Name</strong></td>
</tr>
<tr>
<td><em>Anchoa mitchilli</em></td>
<td>372,214</td>
<td><em>Anchoa mitchilli</em></td>
</tr>
<tr>
<td><em>Eucinostomus spp.</em></td>
<td>55,009</td>
<td><em>Eucinostomus spp.</em></td>
</tr>
<tr>
<td><em>Lagodon rhomboides</em></td>
<td>46,879</td>
<td><em>Lagodon rhomboides</em></td>
</tr>
<tr>
<td><em>Menidia spp.</em></td>
<td>28,014</td>
<td><em>Lucania parva</em></td>
</tr>
<tr>
<td><em>Harengula jaguana</em></td>
<td>20,883</td>
<td><em>Menidia spp.</em></td>
</tr>
<tr>
<td><em>Lucania parva</em></td>
<td>16,072</td>
<td><em>Portunus spp.</em></td>
</tr>
<tr>
<td><em>Eucinostomus gula</em></td>
<td>14,714</td>
<td><em>Eucinostomus gula</em></td>
</tr>
<tr>
<td><em>Eucinostomus harengulus</em></td>
<td>13,705</td>
<td><em>Eucinostomus harengulus</em></td>
</tr>
<tr>
<td><em>Microgobius gulosus</em></td>
<td>5,912</td>
<td><em>Harengula jaguana</em></td>
</tr>
<tr>
<td><em>Bairdiella chrysoura</em></td>
<td>4,997</td>
<td><em>Farfantepenaeus duorarum</em></td>
</tr>
</tbody>
</table>

\[ \Sigma = 578,399 \]

**Total (Selected Taxa)** | 17,038 | 22,409

**Grand Total of Animals Collected** | 627,693 | 363,395

<table>
<thead>
<tr>
<th></th>
<th>N. Indian River Lagoon</th>
<th>Cedar Key</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scientific Name</strong></td>
<td><strong>Number</strong></td>
<td><strong>Scientific Name</strong></td>
</tr>
<tr>
<td><em>Anchoa mitchilli</em></td>
<td>219,320</td>
<td><em>Anchoa mitchilli</em></td>
</tr>
<tr>
<td><em>Eucinostomus spp.</em></td>
<td>23,812</td>
<td><em>Bairdiella chrysoura</em></td>
</tr>
<tr>
<td><em>Diapterus auratus</em></td>
<td>14,881</td>
<td><em>Lagodon rhomboides</em></td>
</tr>
<tr>
<td><em>Eucinostomus harengulus</em></td>
<td>7,488</td>
<td><em>Eucinostomus spp.</em></td>
</tr>
<tr>
<td><em>Bairdiella chrysoura</em></td>
<td>7,185</td>
<td><em>Menidia spp.</em></td>
</tr>
<tr>
<td><em>Harengula jaguana</em></td>
<td>7,097</td>
<td><em>Mugil cephalus</em></td>
</tr>
<tr>
<td><em>Mugil curema</em></td>
<td>5,642</td>
<td><em>Membras martinica</em></td>
</tr>
<tr>
<td><em>Lagodon rhomboides</em></td>
<td>4,805</td>
<td><em>Leiostomus xanthurus</em></td>
</tr>
<tr>
<td><em>Ariopsis felis</em></td>
<td>4,672</td>
<td><em>Ariopsis felis</em></td>
</tr>
<tr>
<td><em>Mugil cephalus</em></td>
<td>2,699</td>
<td><em>Dasyatis sabina</em></td>
</tr>
</tbody>
</table>

\[ \Sigma = 297,601 \]

**Total (Selected Taxa)** | 19,469 | 12,496

**Grand Total of Animals Collected** | 337,283 | 92,546
Table OV17-03. (Continued)

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Number</th>
<th>Scientific Name</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S. Indian River Lagoon</strong></td>
<td></td>
<td><strong>Apalachicola Bay</strong></td>
<td></td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>18,596</td>
<td>Anchoa mitchilli</td>
<td>64,487</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>9,705</td>
<td>Lagodon rhomboides</td>
<td>19,962</td>
</tr>
<tr>
<td>Anchoa lamprotaenia</td>
<td>3,787</td>
<td>Micropogonias undulatus</td>
<td>5,865</td>
</tr>
<tr>
<td>Diapterus auratus</td>
<td>3,266</td>
<td>Cynoscion arenarius</td>
<td>5,616</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>3,231</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brevoortia spp.</td>
<td>2,979</td>
<td>Orthopristis chrysoptera</td>
<td>5,179</td>
</tr>
<tr>
<td>Menidia spp.</td>
<td>2,906</td>
<td>Litopenaeus setiferus</td>
<td>5,050</td>
</tr>
<tr>
<td>Eugerres plumieri</td>
<td>2,845</td>
<td>Leiostomus xanthurus</td>
<td>4,870</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>2,365</td>
<td>Eucinostomus spp.</td>
<td>4,844</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>2,051</td>
<td>Anchoa hepsetus</td>
<td>4,305</td>
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<tr>
<td><strong>Σ =</strong></td>
<td>51,731</td>
<td><strong>125,727</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total (Selected Taxa)</strong></td>
<td>8,198</td>
<td></td>
<td>35,619</td>
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<tr>
<td><strong>Grand Total of Animals Collected</strong></td>
<td>69,563</td>
<td></td>
<td>173,036</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Northeast Florida</strong></td>
<td></td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>79,157</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>18,381</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>16,607</td>
</tr>
<tr>
<td>Menidia menidia</td>
<td>9,439</td>
</tr>
<tr>
<td>Anchoa hepsetus</td>
<td>8,393</td>
</tr>
<tr>
<td>Stellifer lanceolatus</td>
<td>7,396</td>
</tr>
<tr>
<td>Menidia spp.</td>
<td>7,119</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
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</tr>
<tr>
<td>Mugil cephalus</td>
<td>5,926</td>
</tr>
<tr>
<td>Lucania parva</td>
<td>5,418</td>
</tr>
<tr>
<td><strong>Σ =</strong></td>
<td>164,786</td>
</tr>
<tr>
<td><strong>Total (Selected Taxa)</strong></td>
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<tr>
<td><strong>Grand Total of Animals Collected</strong></td>
<td>204,080</td>
</tr>
</tbody>
</table>
Table OV17-04. Number of recreational or commercially important species (Selected Taxa) collected in FIM program stratified-random sample areas, 2017.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Number</th>
<th>Scientific Name</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tampa Bay</td>
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<td>Charlotte Harbor</td>
<td></td>
</tr>
<tr>
<td><strong>Farfantepenaeus duorarum</strong></td>
<td>3,742</td>
<td><strong>Farfantepenaeus duorarum</strong></td>
<td>6,931</td>
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<tr>
<td><strong>Centropomus undecimalis</strong></td>
<td>2,528</td>
<td><strong>Centropomus undecimalis</strong></td>
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<tr>
<td><strong>Sciaenops ocellatus</strong></td>
<td>1,775</td>
<td><strong>Cynoscion arenarius</strong></td>
<td>1,881</td>
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<tr>
<td><strong>Callinectes sapidus</strong></td>
<td>1,496</td>
<td><strong>Lutjanus griseus</strong></td>
<td>1,852</td>
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<tr>
<td><strong>Cynoscion arenarius</strong></td>
<td>1,413</td>
<td><strong>Callinectes sapidus</strong></td>
<td>1,750</td>
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<td><strong>Archosargus probatocephalus</strong></td>
<td>1,087</td>
<td><strong>Mugil cephalus</strong></td>
<td>1,532</td>
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<tr>
<td><strong>Cynoscion nebulosus</strong></td>
<td>757</td>
<td><strong>Archosargus probatocephalus</strong></td>
<td>1,083</td>
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<tr>
<td><strong>Leiostomus xanthurus</strong></td>
<td>663</td>
<td><strong>Sciaenops ocellatus</strong></td>
<td>971</td>
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<tr>
<td><strong>Mugil trichodon</strong></td>
<td>647</td>
<td><strong>Lutjanus synagris</strong></td>
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<tr>
<td><strong>Menticirrhus americanus</strong></td>
<td>450</td>
<td><strong>Menticirrhus americanus</strong></td>
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<tr>
<td><strong>Lutjanus griseus</strong></td>
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<td><strong>Leiostomus xanthurus</strong></td>
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<tr>
<td><strong>Mugil cephalus</strong></td>
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<td><strong>Cynoscion nebulosus</strong></td>
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<td><strong>Mugil curema</strong></td>
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<td><strong>Menipe spp.</strong></td>
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<tr>
<td><strong>Lutjanus synagris</strong></td>
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<td><strong>Mugil trichodon</strong></td>
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<tr>
<td><strong>Elops saurus</strong></td>
<td>338</td>
<td><strong>Mugil curema</strong></td>
<td>123</td>
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<tr>
<td><strong>Pogonias cromis</strong></td>
<td>258</td>
<td><strong>Mycteroperca microlepis</strong></td>
<td>123</td>
</tr>
<tr>
<td><strong>Menipe spp.</strong></td>
<td>171</td>
<td><strong>Paralichthys albigutta</strong></td>
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<td><strong>Paralichthys albigutta</strong></td>
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<td><strong>Pogonias cromis</strong></td>
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<td><strong>Mycteroperca microlepis</strong></td>
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<td><strong>Trachinotus falcatus</strong></td>
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<td><strong>Lutjanus analis</strong></td>
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<td><strong>Pomatomus saltatrix</strong></td>
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<td><strong>Scomberomorus maculatus</strong></td>
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<td><strong>Albula vulpes</strong></td>
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<td><strong>Megalops atlanticus</strong></td>
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<td><strong>Micropogonias undulatus</strong></td>
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<tr>
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</tr>
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<td><strong>Total</strong></td>
<td>22,409</td>
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<tr>
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<td>Number</td>
<td>Scientific Name</td>
<td>Number</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>--------</td>
<td>----------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td><em>Mugil curema</em></td>
<td>5,642</td>
<td><em>Mugil cephalus</em></td>
<td>2,865</td>
</tr>
<tr>
<td><em>Mugil cephalus</em></td>
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OV-x
Table OV17-04. (Continued)

Northeast Florida

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Introduction

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

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

The Fish and Wildlife Research Institute initiated the FIM program in 1985 with funding provided by a Federal Sport Fish Restoration (SFR) grant. In 1988, additional funding became available from special appropriations. The FIM program is 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 Indian River Lagoon (IRL) during 1990, in Cedar Key during 1996, in the southern IRL during 1997, in Apalachicola Bay during 1998, and in northeast Florida during 2001. Sampling was also conducted in Choctawhatchee Bay/Santa Rosa Sound between 1992 and 1997, in Florida Bay between 1993 and 1997, and in Florida Keys National Marine Sanctuary between 1998 and 2004 (Figure FIM16-01). 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 subtropical to temperate regions and includes habitats such as seagrass beds, salt marshes, and mangroves. These habitats provide critical nursery areas for many fish and invertebrate species. It is estimated that more than 70% of the recreationally-important species and more than 90% of the commercially-important species in the Gulf of Mexico are estuarine-dependent during at least one stage of their life histories (Lindall and Saloman 1997). The FIM program data are summarized and analyzed for all fish and selected invertebrate species collected, yielding information on the relative abundance, recruitment, habitat use, and distribution of hundreds of estuarine and marine species. This approach provides a unique source of information on economically valuable species as well as on many poorly understood non-game species that may influence fisheries or may be important ecological indicators. This type of multi-species, multi-habitat, long-term monitoring program is extremely valuable for documenting ecosystem changes, evaluating the effects of natural and anthropogenic disturbances, and making management decisions (Coull 1985, Wolfe et al. 1987).

Although the FIM program has always used a suite of gears (e.g., seines, trawls, trammel nets) capable of capturing a broad range of fish species and sizes from a variety of habitats, initial program efforts focused primarily on collecting young-of-the-year (YOY) fishes that could be used to develop recruitment indices. The program expanded its efforts to monitor larger-sized fishes in Tampa Bay by developing 183-m haul seines (fixed stations sampled between 1993 and 1995; year-round stratified-random sampling
[SRS] implemented in 1996), 183-m purse seines (implemented in 1997; discontinued in 2004), and by developing a visual sampling program for reef fishes in the Florida Keys (implemented in 1998; 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 utilizes 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 Indian River Lagoon in 1995. The Red Drum sampling program utilizes a 547-m trammel net. The directed sampling in Indian River Lagoon 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 report summarizes FIM program SRS data collected during 2016. Results from the sampling efforts in each estuary are presented separately. This report also summarizes results from fish health monitoring of samples collected by the FIM program. Profiles of several species that are of particular interest, because of their recreational or commercial value in Florida, are also presented, providing critical information for these species while also
describing some of the ways the FIM program data are used to assess the status of important Florida fisheries.

**Methods**

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

The FIM program uses a multi-gear approach to collect data on various life history stages of fishes and selected invertebrates from a wide variety of habitats (Table FIM16-01). A 21.3-m center bag seine targeted YOY and juvenile fishes in shallow water (≤1.8-m); a 6.1-m otter trawl targeted YOY, juvenile, and adult fish in deep water (1.0–7.6-m); a 183-m haul seine targeted sub-adult and adult fish along shorelines in water depths ≤2.5-m. Several different techniques were used, depending upon habitat, to stratify the samples collected with the various gears. The 21.3-m center bag seine was used in Tampa Bay, Charlotte Harbor, the northern IRL, Cedar Key, Apalachicola Bay, and northeast Florida. 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 bay seine technique was used in all estuaries except 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 river seine technique was used in all estuaries to sample the shorelines of creeks and rivers. River seine deployments in Tampa Bay and Charlotte Harbor’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 the northern and southern IRL were post-stratified by the presence or absence of overhanging shoreline vegetation. Samples collected with this gear were not stratified by habitat type in Cedar Key, Apalachicola Bay, and northeast Florida. All sampling was conducted during daytime hours (one hour after sunrise to one hour before sunset). Additional sampling details are described in the FIM program’s Procedure Manual (FWC-FWRI 2016).

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 2016).

Certain taxa were not identified to species because of the possibility of hybridization (e.g., Brevoortia spp., Menidia spp.; Dahlberg 1970, Middaugh et al. 1986) or because they were morphologically or meristically indistinguishable at small juvenile sizes (e.g., Eucinostomus spp. <40 mm SL; Matheson 1983). In northern and southern IRL and northeast Florida sections, species accounts of Cynoscion regalis (Weakfish) and Cynoscion arenarius (Sand Seatrout) will be referred to collectively as Cynoscion complex. These two species mix and hybridize along the Atlantic coast of Florida and identification can only be determined with certainty by genetic testing (Tringali et al. 2004). Animals were released except for representative samples of each taxon (for laboratory confirmation of field identifications) and samples required for specific research projects. The taxonomic nomenclature in this report follows the American Fisheries Society’s Common and Scientific Names of Fishes (Page et al. 2013). A detailed explanation of the standard sample work-up for data collection is described in the FIM program’s Procedure Manual (FWC-FWRI 2016).
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 FIM16-02). Abundance estimates were calculated for 21.3-m seines and 6.1-m trawls as the number of animals/100 m² of area sampled. Catch-per-unit-effort (CPUE) was calculated for 183-m haul seine samples as the number of animals/set. The appendices for each study area describe the catch by month, gear, stratum, and zone.

**Study Areas**

The FIM program conducted sampling in Tampa Bay, Charlotte Harbor, the northern IRL, Cedar Key, the southern IRL, Apalachicola Bay, and northeast Florida, (Figure FIM16-01). Sampling was conducted over a wide range of habitats encompassing different bottom types, shoreline types, and offshore areas. In addition to sampling in major estuaries, tidally-influenced portions of rivers that flow into Tampa Bay (Alafia, Braden, Little Manatee, and Manatee Rivers), Charlotte Harbor (Peace, Myakka, and Caloosahatchee Rivers, and 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 (Southern Indian River Lagoon section, TQ-1).
References


Figure FIM17-01. Locations of Fisheries-Independent Monitoring program field laboratories. Years indicate initiation of sampling. If sampling was discontinued at a field lab, the last year of sampling is also provided.
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<tr>
<th>Gear</th>
<th>Deployment</th>
<th>Mesh Size (mm)</th>
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<th>Description of use</th>
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<td>3.2</td>
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<td>4,120 m²</td>
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<td>6.1-m Otter Trawl</td>
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<tr>
<td></td>
<td>Arc Tow</td>
<td>38.1 (3.2-mm liner)</td>
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Table FIM17-02. Animals designated as Selected Taxa because of their commercial or recreational importance.

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<tr>
<td>Cynoscion complex</td>
<td>Seatrout</td>
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<tr>
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<td><em>Trachinotus goodei</em></td>
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Tampa Bay

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

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in Tampa Bay since 1989. The area sampled was divided into five geographically-defined bay zones (A–E) and four riverine zones (K–N; Figure TB17-01). The riverine zones were defined as the Alafia (K), Little Manatee (L), Manatee (M), and Braden (N) rivers. Monthly stratified-random sampling (SRS) was conducted in Zones A–E using 21.3-m bay seines, 183-m haul seines, and 6.1-m bay otter trawls. Monthly SRS was conducted in Zones K–N with 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2017 in Tampa Bay.

Stratified-Random Sampling

A total of 627,693 animals, which included 148 taxa of fishes and 10 taxa of selected invertebrates, were collected from 1,428 Tampa Bay SRS samples in 2017 (Table TB17-01, Appendices TB17-01, -02, and -03). *Anchoa mitchilli* (n=372,214) was the most numerous taxon collected, representing 59.3% of the total catch. *Eucinostomus* spp. (n=55,009) and *Lagodon rhomboides* (n=46,879) were the next most abundant taxa collected, accounting for an additional 16.2% of the total catch. Twenty-seven Selected Taxa (n=17,038 animals) composed 2.7% of the total catch. *Farfantepenaeus duorarum* (n=3,742) was the most abundant Selected Taxon, representing 0.6% of the total catch. *Centropomus undecimalis* (n=2,528), *Sciaenops ocellatus* (n=1,775), *Callinectes sapidus* (n=1,496), and *Cynoscion*
*arenarius* (n=1,413) were the next most abundant Selected Taxa, comprising an additional 1.1% of the total catch. Collections in 2017 included three species new to the Tampa Bay FIM collection: *Protemblemaria punctata* (Warhead Blenny), *Albula conorhynchus* (Lagoon Bonefish), and *Syngnathus springeri* (Bull Pipefish).

**Bay Sampling**

21.3-m *Bay Seines*. A total of 207,474 animals were collected in 408 21.3-m bay seines, representing 33.1% of the overall SRS catch (Table TB17-01). *Anchoa mitchilli* (n=95,099) and *Eucinostomus* spp. (n=31,572) were the most abundant taxa, accounting for 61.1% of the 21.3-m bay seine catch (Table TB17-02). The taxa most frequently caught in 21.3-m bay seines were *Eucinostomus* spp. (60.3% occurrence) and *Eucinostomus gula* (51.2% occurrence).

A total of 5,147 animals from 20 Selected Taxa were collected, representing 2.5% of the entire 21.3-m bay seine catch (Table TB17-03). *Farfantepenaeus duorarum* (n=2,476) was the most abundant Selected Taxon, accounting for 48.1% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m bay seines were *F. duorarum* (36.0% occurrence) and *Cynoscion nebulosus* (21.1% occurrence).

183-m *Haul Seines*. A total of 48,418 animals were collected in 240 183-m haul seines, representing 7.7% of the overall SRS catch (Table TB17-01). *Lagodon rhomboides* (n=28,219) was the most abundant taxon, accounting for 58.3% of the 183-m haul seine catch (Table TB17-04). The taxa most frequently caught in 183-m haul seines were *L. rhomboides* (61.7% occurrence), *C. undecimalis* (54.6% occurrence), and *E. gula* (49.2% occurrence).

A total of 5,315 animals from 26 Selected Taxa were collected, representing 11.0% of the entire 183-m haul seine catch (Table TB17-05). *Centropomus undecimalis* (n=1,839) and *Archosargus probatocephalus* (n=789) were the most abundant Selected Taxa, accounting for 49.4% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 183-m haul seines were *C. undecimalis* (54.6% occurrence) and *A. probatocephalus* (47.9% occurrence).

6.1-m *Bay Otter Trawls*. A total of 16,728 animals were collected in 180 6.1-m bay otter trawls, representing 2.7% of the overall SRS catch (Table TB17-01). *Portunus* spp. (n=2,639), *L. rhomboides* (n=2,498), *A. mitchilli* (n=2,087), and *E. gula* (n=2,071) were the most abundant taxa, accounting for 55.6% of the 6.1-m bay otter trawl catch (Table TB17-
06). The taxa most frequently caught in 6.1-m bay otter trawls were *Prionotus scitulus* (68.9% occurrence), *Portunus* spp. (48.9% occurrence), and *F. duorarum* (45.0% occurrence).

A total of 2,434 animals from 13 Selected Taxa were collected, representing 14.6% of the entire 6.1-m bay otter trawl catch (Table TB17-07). *Cynoscion arenarius* (n=790), *F. duorarum* (n=579), and *C. sapidus* (n=494) were the most abundant Selected Taxa, accounting for 76.5% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 6.1-m bay otter trawls were *F. duorarum* (45.0% occurrence), *C. sapidus* (25.0% occurrence), and *Menippe* spp. (23.9% occurrence).

**River Sampling**

21.3-m River Seines. A total of 307,539 animals were collected in 432 21.3-m river seines, representing 49.0% of the overall SRS catch (Table TB17-01). *Anchoa mitchilli* (n=236,447) was the most abundant taxon collected, accounting for 76.9% of the 21.3-m river seine catch (Table TB17-08). *Menidia* spp. (n=21,564) and *Eucinostomus* spp. (n=19,726) were the next most abundant taxa, accounting for an additional 13.4% of the 21.3-m river seine catch. The taxa most frequently caught in 21.3-m river seines were *Eucinostomus* spp. (81.9% occurrence), *E. harengulus* (78.7% occurrence), and *Menidia* spp. (72.9% occurrence).

A total of 2,437 animals from 18 Selected Taxa were collected, representing 0.8% of the entire 21.3-m river seine catch (Table TB17-09). *Sciaenops ocellatus* (n=830) and *C. undecimalis* (n=675) were the most abundant Selected Taxa, accounting for 61.8% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m river seines were *C. undecimalis* (34.5% occurrence) and *F. duorarum* (21.5% occurrence).

6.1-m River Otter Trawls. A total of 47,534 animals were collected in 168 6.1-m river otter trawls, representing 7.6% of the overall SRS catch (Table TB17-01). *Anchoa mitchilli* (n=38,581) was the most abundant taxon collected, accounting for 81.2% of the 6.1-m river otter trawl catch (Table TB17-10). The taxa most frequently caught in 6.1-m river otter trawls were *C. sapidus* (56.5% occurrence), *F. duorarum* (47.0% occurrence), *Trinectes maculatus* (42.3% occurrence), and *Eucinostomus* spp. (41.7% occurrence).

A total of 1,705 animals from 13 Selected Taxa were collected, representing 3.6% of the entire 6.1-m river otter trawl catch (Table TB17-11). *Cynoscion arenarius* (n=585), *F. duorarum* (n=406), and *Callinectes sapidus* (n=336) 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 *C. sapidus* (56.5% occurrence) and *F. duorarum* (47.0% occurrence).
References


Figure TB17-01. Map of Tampa Bay sampling area. Zones are labeled A—E and K—N.
Table TB17-01. Summary of catch and effort data for Tampa Bay stratified-random sampling, 2017.

<table>
<thead>
<tr>
<th>Zone</th>
<th>21.3-m bay seine</th>
<th>21.3-m river seine</th>
<th>183-m haul seine</th>
<th>6.1-m otter trawl</th>
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<td>96</td>
<td>.</td>
</tr>
<tr>
<td>N</td>
<td>.</td>
<td>.</td>
<td>64,165</td>
<td>72</td>
<td>.</td>
</tr>
<tr>
<td></td>
<td>Totals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>207,474</td>
<td>408</td>
<td>307,539</td>
<td>432</td>
<td>48,418</td>
</tr>
</tbody>
</table>
Table TB17-02. Catch statistics for 10 dominant taxa collected in 408 21.3-m bay seine samples during Tampa Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m$^2$)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>95,099</td>
<td>45.8</td>
<td>166.49</td>
<td>65.71</td>
<td>797.26</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>31,572</td>
<td>15.2</td>
<td>55.27</td>
<td>8.00</td>
<td>292.50</td>
</tr>
<tr>
<td>Harengula jaguana</td>
<td>15,708</td>
<td>7.6</td>
<td>27.50</td>
<td>14.60</td>
<td>1,072.38</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>14,837</td>
<td>7.2</td>
<td>25.98</td>
<td>4.59</td>
<td>357.30</td>
</tr>
<tr>
<td>Lucania parva</td>
<td>14,677</td>
<td>7.1</td>
<td>25.70</td>
<td>7.08</td>
<td>556.60</td>
</tr>
<tr>
<td>Menidia spp.</td>
<td>6,448</td>
<td>3.1</td>
<td>11.29</td>
<td>2.73</td>
<td>488.50</td>
</tr>
<tr>
<td>Eucinostomus gula</td>
<td>5,337</td>
<td>2.6</td>
<td>9.34</td>
<td>1.05</td>
<td>226.49</td>
</tr>
<tr>
<td>Microgobius gulosus</td>
<td>3,978</td>
<td>1.9</td>
<td>6.96</td>
<td>1.14</td>
<td>330.94</td>
</tr>
<tr>
<td>Bairdiella chrysoura</td>
<td>3,246</td>
<td>1.6</td>
<td>5.68</td>
<td>1.74</td>
<td>617.16</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>2,476</td>
<td>1.2</td>
<td>4.33</td>
<td>1.01</td>
<td>468.37</td>
</tr>
<tr>
<td>Subtotals</td>
<td>193,378</td>
<td>93.2</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Totals</td>
<td>207,474</td>
<td>100.0</td>
<td>363.22</td>
<td>73.49</td>
<td>408.69</td>
</tr>
</tbody>
</table>

TB-8
Table TB17-03. Catch statistics for Selected Taxa collected in 408 21.3-m bay seine samples during Tampa Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>2,476</td>
<td>1.2</td>
<td>36.0</td>
<td>4.33</td>
<td>1.01</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>787</td>
<td>0.4</td>
<td>11.0</td>
<td>1.38</td>
<td>0.53</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>547</td>
<td>0.3</td>
<td>21.1</td>
<td>0.96</td>
<td>0.18</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>309</td>
<td>0.2</td>
<td>3.7</td>
<td>0.54</td>
<td>0.27</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>243</td>
<td>0.1</td>
<td>2.5</td>
<td>0.43</td>
<td>0.39</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>226</td>
<td>0.1</td>
<td>18.6</td>
<td>0.40</td>
<td>0.07</td>
</tr>
<tr>
<td>Mugil trichodon</td>
<td>138</td>
<td>0.1</td>
<td>2.5</td>
<td>0.24</td>
<td>0.17</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>108</td>
<td>0.1</td>
<td>8.3</td>
<td>0.19</td>
<td>0.05</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>102</td>
<td>0.1</td>
<td>7.6</td>
<td>0.18</td>
<td>0.05</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>99</td>
<td>0.1</td>
<td>5.6</td>
<td>0.17</td>
<td>0.06</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>25</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>24</td>
<td>&lt;0.1</td>
<td>3.9</td>
<td>0.04</td>
<td>0.01</td>
</tr>
<tr>
<td>Menticirrhus saxatilis</td>
<td>18</td>
<td>&lt;0.1</td>
<td>2.2</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>17</td>
<td>&lt;0.1</td>
<td>1.2</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>13</td>
<td>&lt;0.1</td>
<td>2.7</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>9</td>
<td>&lt;0.1</td>
<td>1.5</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Menippe spp.</td>
<td>2</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

TB-9
Table TB17-03. (Continued).

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Scomberomorus maculatus</td>
<td>2</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Mycteroperca microlepis</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Menticirrhus littoralis</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Totals</td>
<td>5,147</td>
<td>2.5</td>
<td>.</td>
<td>9.01</td>
</tr>
</tbody>
</table>
Table TB17-04. Catch statistics for 10 dominant taxa collected in 240 183-m haul seine samples during Tampa Bay stratified-random sampling, 2017. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td><em>Lagodon rhomboides</em></td>
<td>28,219</td>
<td>58.3</td>
<td>61.7</td>
<td>117.58</td>
<td>17.98</td>
</tr>
<tr>
<td><em>Eucinostomus gula</em></td>
<td>4,887</td>
<td>10.1</td>
<td>49.2</td>
<td>20.36</td>
<td>5.74</td>
</tr>
<tr>
<td><em>Eucinostomus harengulus</em></td>
<td>2,653</td>
<td>5.5</td>
<td>34.6</td>
<td>11.05</td>
<td>3.82</td>
</tr>
<tr>
<td><em>Harengula jaguana</em></td>
<td>1,877</td>
<td>3.9</td>
<td>9.6</td>
<td>7.82</td>
<td>5.98</td>
</tr>
<tr>
<td><em>Centropomus undecimalis</em></td>
<td>1,839</td>
<td>3.8</td>
<td>54.6</td>
<td>7.66</td>
<td>1.64</td>
</tr>
<tr>
<td><em>Ariopsis felis</em></td>
<td>1,087</td>
<td>2.3</td>
<td>32.5</td>
<td>4.53</td>
<td>0.79</td>
</tr>
<tr>
<td><em>Strongylura notata</em></td>
<td>811</td>
<td>1.7</td>
<td>40.8</td>
<td>3.38</td>
<td>1.38</td>
</tr>
<tr>
<td><em>Archosargus probatocephalus</em></td>
<td>789</td>
<td>1.6</td>
<td>47.9</td>
<td>3.29</td>
<td>0.49</td>
</tr>
<tr>
<td><em>Caranx hippos</em></td>
<td>557</td>
<td>1.2</td>
<td>11.7</td>
<td>2.32</td>
<td>2.03</td>
</tr>
<tr>
<td><em>Orthopristis chrysoptera</em></td>
<td>469</td>
<td>1.0</td>
<td>17.1</td>
<td>1.95</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Subtotals 43,188 89.2 . . . . . . 38 918

Totals 48,418 100.0 201.74 24.26 186.27 3,189.00 . . 12 971
Table TB17-05. Catch statistics for Selected Taxa collected in 240 183-m haul seine samples during Tampa Bay stratified-random sampling, 2017. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>1,839</td>
<td>3.8</td>
<td>54.6</td>
<td>7.66</td>
<td>1.64</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>789</td>
<td>1.6</td>
<td>47.9</td>
<td>3.29</td>
<td>0.49</td>
</tr>
<tr>
<td>Mugil trichodon</td>
<td>430</td>
<td>0.9</td>
<td>13.3</td>
<td>1.79</td>
<td>0.85</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>326</td>
<td>0.7</td>
<td>38.3</td>
<td>1.36</td>
<td>0.18</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>290</td>
<td>0.6</td>
<td>9.2</td>
<td>1.21</td>
<td>0.78</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>289</td>
<td>0.6</td>
<td>32.1</td>
<td>1.20</td>
<td>0.21</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>286</td>
<td>0.6</td>
<td>22.9</td>
<td>1.19</td>
<td>0.33</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>284</td>
<td>0.6</td>
<td>24.2</td>
<td>1.18</td>
<td>0.38</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>233</td>
<td>0.5</td>
<td>17.1</td>
<td>0.97</td>
<td>0.22</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>190</td>
<td>0.4</td>
<td>7.9</td>
<td>0.79</td>
<td>0.44</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>107</td>
<td>0.2</td>
<td>23.3</td>
<td>0.45</td>
<td>0.08</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>101</td>
<td>0.2</td>
<td>14.6</td>
<td>0.42</td>
<td>0.12</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>34</td>
<td>0.1</td>
<td>8.3</td>
<td>0.14</td>
<td>0.04</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>26</td>
<td>0.1</td>
<td>4.6</td>
<td>0.11</td>
<td>0.05</td>
</tr>
<tr>
<td>Trachinotus falcatus</td>
<td>20</td>
<td>&lt;0.1</td>
<td>2.5</td>
<td>0.08</td>
<td>0.06</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>18</td>
<td>&lt;0.1</td>
<td>2.9</td>
<td>0.08</td>
<td>0.04</td>
</tr>
<tr>
<td>Mycteroperca microlepis</td>
<td>16</td>
<td>&lt;0.1</td>
<td>4.2</td>
<td>0.07</td>
<td>0.03</td>
</tr>
</tbody>
</table>
Table TB17-05. (Continued).

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Scomberomorus maculatus</td>
<td>14</td>
<td>&lt;0.1</td>
<td>3.8</td>
<td>0.06</td>
</tr>
<tr>
<td>Trachinotus carolinus</td>
<td>7</td>
<td>&lt;0.1</td>
<td>2.1</td>
<td>0.03</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>4</td>
<td>&lt;0.1</td>
<td>0.8</td>
<td>0.02</td>
</tr>
<tr>
<td>Pomatomus saltatrix</td>
<td>4</td>
<td>&lt;0.1</td>
<td>0.8</td>
<td>0.02</td>
</tr>
<tr>
<td>Rachycentron canadum</td>
<td>3</td>
<td>&lt;0.1</td>
<td>0.4</td>
<td>0.01</td>
</tr>
<tr>
<td>Menippe spp.</td>
<td>2</td>
<td>&lt;0.1</td>
<td>0.4</td>
<td>0.01</td>
</tr>
<tr>
<td>Megalops atlanticus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.4</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.4</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Menticirrhus littoralis</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.4</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>5,315</strong></td>
<td><strong>11.0</strong></td>
<td><strong>.</strong></td>
<td><strong>22.15</strong></td>
</tr>
</tbody>
</table>
Table TB17-06. Catch statistics for 10 dominant taxa collected in 180 6.1-m bay otter trawl samples during Tampa Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Portunus spp.</td>
<td>2,639</td>
<td>15.8</td>
<td>48.9</td>
<td>1.01</td>
<td>0.23</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>2,498</td>
<td>14.9</td>
<td>32.8</td>
<td>0.95</td>
<td>0.35</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>2,087</td>
<td>12.5</td>
<td>17.2</td>
<td>0.80</td>
<td>0.24</td>
</tr>
<tr>
<td>Eucinostomus gula</td>
<td>2,071</td>
<td>12.4</td>
<td>33.3</td>
<td>0.79</td>
<td>0.19</td>
</tr>
<tr>
<td>Prionotus scitulus</td>
<td>1,495</td>
<td>8.9</td>
<td>68.9</td>
<td>0.57</td>
<td>0.11</td>
</tr>
<tr>
<td>Orthopristis chrysoptera</td>
<td>931</td>
<td>5.6</td>
<td>16.7</td>
<td>0.35</td>
<td>0.13</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>790</td>
<td>4.7</td>
<td>12.8</td>
<td>0.29</td>
<td>0.15</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>579</td>
<td>3.5</td>
<td>45.0</td>
<td>0.21</td>
<td>0.07</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>494</td>
<td>3.0</td>
<td>25.0</td>
<td>0.19</td>
<td>0.05</td>
</tr>
<tr>
<td>Symphurus plagiusa</td>
<td>290</td>
<td>1.7</td>
<td>30.0</td>
<td>0.11</td>
<td>0.03</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
<td>13,874</td>
<td>82.9</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>16,728</td>
<td>100.0</td>
<td>.</td>
<td>6.36</td>
<td>0.74</td>
</tr>
</tbody>
</table>
Table TB17-07. Catch statistics for Selected Taxa collected in 180 6.1-m bay otter trawl samples during Tampa Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number No.</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m$^2$) Mean</th>
<th>Stderr</th>
<th>CV</th>
<th>Max</th>
<th>Standard Length (mm) Mean</th>
<th>Stderr</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cynoscion arenarius</td>
<td>790</td>
<td>4.7</td>
<td>0.29</td>
<td>0.15</td>
<td>685.13</td>
<td>22.68</td>
<td>39</td>
<td>0.70</td>
<td>11</td>
<td>180</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>579</td>
<td>3.5</td>
<td>0.21</td>
<td>0.07</td>
<td>418.41</td>
<td>11.31</td>
<td>17</td>
<td>0.27</td>
<td>3</td>
<td>38</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>494</td>
<td>3.0</td>
<td>0.19</td>
<td>0.05</td>
<td>382.75</td>
<td>6.75</td>
<td>78</td>
<td>1.56</td>
<td>11</td>
<td>234</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>223</td>
<td>1.3</td>
<td>0.08</td>
<td>0.04</td>
<td>647.23</td>
<td>7.02</td>
<td>73</td>
<td>1.67</td>
<td>15</td>
<td>146</td>
</tr>
<tr>
<td>Menippe spp.</td>
<td>166</td>
<td>1.0</td>
<td>0.06</td>
<td>0.01</td>
<td>310.54</td>
<td>1.41</td>
<td>23</td>
<td>1.01</td>
<td>4</td>
<td>75</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>61</td>
<td>0.4</td>
<td>0.02</td>
<td>0.01</td>
<td>329.09</td>
<td>0.64</td>
<td>76</td>
<td>9.54</td>
<td>10</td>
<td>252</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>38</td>
<td>0.2</td>
<td>0.02</td>
<td>0.01</td>
<td>746.54</td>
<td>1.43</td>
<td>88</td>
<td>10.73</td>
<td>13</td>
<td>203</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>31</td>
<td>0.2</td>
<td>0.01</td>
<td>0.01</td>
<td>702.99</td>
<td>0.71</td>
<td>128</td>
<td>6.47</td>
<td>29</td>
<td>214</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>23</td>
<td>0.1</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>299.93</td>
<td>0.14</td>
<td>225</td>
<td>14.94</td>
<td>98</td>
<td>372</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>18</td>
<td>0.1</td>
<td>0.01</td>
<td>&lt;0.01</td>
<td>536.35</td>
<td>0.37</td>
<td>90</td>
<td>21.98</td>
<td>16</td>
<td>312</td>
</tr>
<tr>
<td>Mycteroperca microlepis</td>
<td>6</td>
<td>&lt;0.1</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>991.03</td>
<td>0.27</td>
<td>215</td>
<td>25.28</td>
<td>161</td>
<td>307</td>
</tr>
<tr>
<td>Menticirrhus saxatilis</td>
<td>4</td>
<td>&lt;0.1</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>946.03</td>
<td>0.14</td>
<td>194</td>
<td>17.83</td>
<td>155</td>
<td>240</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
<td>1,341.64</td>
<td>0.07</td>
<td>14</td>
<td>.</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Totals</td>
<td>2,434</td>
<td>14.6</td>
<td>.</td>
<td>0.91</td>
<td>0.22</td>
<td>323.23</td>
<td>34.18</td>
<td>.</td>
<td>.</td>
<td>3</td>
</tr>
</tbody>
</table>
Table TB17-08. Catch statistics for 10 dominant taxa collected in 432 21.3-m river seine samples during Tampa Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>236,447</td>
<td>76.9</td>
<td>53.7</td>
<td>804.90</td>
<td>160.87</td>
</tr>
<tr>
<td>Menidia spp.</td>
<td>21,564</td>
<td>7.0</td>
<td>72.9</td>
<td>73.41</td>
<td>12.75</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>19,726</td>
<td>6.4</td>
<td>81.9</td>
<td>67.15</td>
<td>6.80</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>9,327</td>
<td>3.0</td>
<td>78.7</td>
<td>31.75</td>
<td>3.43</td>
</tr>
<tr>
<td>Harengula jaguana</td>
<td>3,213</td>
<td>1.0</td>
<td>3.9</td>
<td>10.94</td>
<td>10.46</td>
</tr>
<tr>
<td>Eucinostomus gula</td>
<td>2,148</td>
<td>0.7</td>
<td>22.7</td>
<td>7.31</td>
<td>1.87</td>
</tr>
<tr>
<td>Microgobius gulosus</td>
<td>1,655</td>
<td>0.5</td>
<td>40.5</td>
<td>5.63</td>
<td>1.22</td>
</tr>
<tr>
<td>Trinectes maculatus</td>
<td>1,654</td>
<td>0.5</td>
<td>40.5</td>
<td>5.63</td>
<td>0.88</td>
</tr>
<tr>
<td>Lucania parva</td>
<td>1,374</td>
<td>0.5</td>
<td>16.2</td>
<td>4.68</td>
<td>1.01</td>
</tr>
<tr>
<td>Eugerres plumieri</td>
<td>1,151</td>
<td>0.4</td>
<td>29.6</td>
<td>3.92</td>
<td>0.67</td>
</tr>
<tr>
<td>Subtotals</td>
<td>298,259</td>
<td>97.0</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Totals</td>
<td>307,539</td>
<td>100.0</td>
<td>1,046.91</td>
<td>164.62</td>
<td>326.82</td>
</tr>
</tbody>
</table>
Table TB17-09. Catch statistics for Selected Taxa collected in 432 21.3-m river seine samples during Tampa Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number No.</th>
<th>%</th>
<th>Density Estimate (animals/100m$^2$)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>830</td>
<td>0.3</td>
<td>18.1</td>
<td>2.83</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>675</td>
<td>0.2</td>
<td>34.5</td>
<td>2.30</td>
</tr>
<tr>
<td>Farfantepeanaeus duorarum</td>
<td>255</td>
<td>0.1</td>
<td>21.5</td>
<td>0.87</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>151</td>
<td>0.1</td>
<td>19.4</td>
<td>0.51</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>94</td>
<td>&lt;0.1</td>
<td>14.4</td>
<td>0.32</td>
</tr>
<tr>
<td>Mugil trichodon</td>
<td>79</td>
<td>&lt;0.1</td>
<td>3.7</td>
<td>0.27</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>71</td>
<td>&lt;0.1</td>
<td>3.5</td>
<td>0.24</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>59</td>
<td>&lt;0.1</td>
<td>4.4</td>
<td>0.20</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>56</td>
<td>&lt;0.1</td>
<td>5.6</td>
<td>0.19</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>54</td>
<td>&lt;0.1</td>
<td>2.3</td>
<td>0.18</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>50</td>
<td>&lt;0.1</td>
<td>3.9</td>
<td>0.17</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>43</td>
<td>&lt;0.1</td>
<td>6.5</td>
<td>0.15</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>12</td>
<td>&lt;0.1</td>
<td>1.4</td>
<td>0.04</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>4</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>0.01</td>
</tr>
<tr>
<td>Menippe sp.</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Menticirrhus saxatilis</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>2,437</strong></td>
<td><strong>0.8</strong></td>
<td><strong>8.30</strong></td>
<td><strong>0.89</strong></td>
</tr>
</tbody>
</table>
Table TB17-10. Catch statistics for 10 dominant taxa collected in 168 6.1-m river otter trawl samples during Tampa Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>38,581</td>
<td>81.2</td>
<td>31.39</td>
<td>10.91</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>3,540</td>
<td>7.5</td>
<td>41.7</td>
<td>2.89</td>
</tr>
<tr>
<td>Trinectes maculatus</td>
<td>1,605</td>
<td>3.4</td>
<td>42.3</td>
<td>1.35</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>585</td>
<td>1.2</td>
<td>22.0</td>
<td>0.46</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>415</td>
<td>0.9</td>
<td>39.9</td>
<td>0.35</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>406</td>
<td>0.9</td>
<td>47.0</td>
<td>0.33</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>336</td>
<td>0.7</td>
<td>56.5</td>
<td>0.27</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>321</td>
<td>0.7</td>
<td>14.9</td>
<td>0.26</td>
</tr>
<tr>
<td>Microgobius gulosus</td>
<td>275</td>
<td>0.6</td>
<td>32.1</td>
<td>0.23</td>
</tr>
<tr>
<td>Eucinostomus gula</td>
<td>271</td>
<td>0.6</td>
<td>13.1</td>
<td>0.22</td>
</tr>
<tr>
<td>Subtotals</td>
<td>46,335</td>
<td>97.5</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Totals</td>
<td>47,534</td>
<td>100.0</td>
<td>38.72</td>
<td>11.03</td>
</tr>
</tbody>
</table>
Table TB17-11. Catch statistics for Selected Taxa collected in 168 6.1-m river otter trawl samples during Tampa Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>585</td>
<td>1.2</td>
<td>0.46</td>
<td>0.17</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>406</td>
<td>0.9</td>
<td>0.33</td>
<td>0.06</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>336</td>
<td>0.7</td>
<td>0.27</td>
<td>0.04</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>138</td>
<td>0.3</td>
<td>0.11</td>
<td>0.04</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>64</td>
<td>0.1</td>
<td>0.05</td>
<td>0.01</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>67</td>
<td>0.1</td>
<td>0.05</td>
<td>0.05</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>51</td>
<td>0.1</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>35</td>
<td>0.1</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>11</td>
<td>0.0</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>5</td>
<td>0.0</td>
<td>3.0</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>4</td>
<td>0.0</td>
<td>1.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Menticirrhus saxatilis</td>
<td>2</td>
<td>0.0</td>
<td>1.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>1</td>
<td>0.0</td>
<td>0.6</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Totals</td>
<td>1,705</td>
<td>3.6</td>
<td>.</td>
<td>1.36</td>
</tr>
</tbody>
</table>

TB-19
Appendix TB17-01. Monthly summary of species collected during Tampa Bay stratified-random sampling, 2017. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

<table>
<thead>
<tr>
<th>Species</th>
<th>Month</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Jan</td>
<td>Feb</td>
</tr>
<tr>
<td>Acanthostracion quadricornis</td>
<td>21</td>
<td>9</td>
</tr>
<tr>
<td>Achirus lineatus</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Albula conorhynchus</td>
<td></td>
<td>.</td>
</tr>
<tr>
<td>Aluterus schoepfii</td>
<td>1</td>
<td>.</td>
</tr>
<tr>
<td>Ameiurus catus</td>
<td></td>
<td>.</td>
</tr>
<tr>
<td>Ameiurus spp.</td>
<td></td>
<td>.</td>
</tr>
<tr>
<td>Anarchopterus criniger</td>
<td></td>
<td>.</td>
</tr>
<tr>
<td>Anchoa cubana</td>
<td></td>
<td>.</td>
</tr>
<tr>
<td>Anchoa hepsetus</td>
<td></td>
<td>.</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>14,930</td>
<td>5,629</td>
</tr>
<tr>
<td>Anchoa spp.</td>
<td></td>
<td>.</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>174</td>
<td>108</td>
</tr>
<tr>
<td>Argopecten irradians</td>
<td></td>
<td>.</td>
</tr>
<tr>
<td>Ariopsis felis</td>
<td>56</td>
<td>67</td>
</tr>
<tr>
<td>Astroscopus y-graecum</td>
<td>.</td>
<td>1</td>
</tr>
<tr>
<td>Atherinopsidae sp.</td>
<td>.</td>
<td>1</td>
</tr>
<tr>
<td>Bagre marinus</td>
<td>1</td>
<td>.</td>
</tr>
<tr>
<td>Bairdiella chrysoura</td>
<td>2</td>
<td>171</td>
</tr>
<tr>
<td>Bathygobius soporator</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Bathygobius spp.</td>
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Appendix TB17-02. Summary by gear and stratum of species collected during Tampa Bay stratified-random sampling, 2017. 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.

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Appendix TB17-02. (Continued).

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## Summary by zone of species collected during Tampa Bay stratified-random sampling, 2017.

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.

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TB-39
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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 CH17-01). Monthly stratified-random sampling (SRS) was conducted in Zones A–D using 21.3-m bay seines, 183-m haul seines, and 6.1-m bay otter trawls. Monthly SRS was conducted in Zones M and P with 21.3-m river seines and 6.1-m river otter trawls, and 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 the Methods section of this report. This section summarizes data collected by the FIM program during 2017 in Charlotte Harbor.

Stratified-Random Sampling

A total of 363,395 animals, which included 169 taxa of fishes and 11 taxa of selected invertebrates, were collected from 1,476 Charlotte Harbor SRS samples in 2017 (Table CH17-01, Appendices CH17-01, -02, and -03). *Anchoa mitchilli* (n=98,998), *Eucinostomus* spp. (n=59,575), and *Lagodon rhomboides* (n=58,376) were the most numerous species collected, representing 59.7% of the total catch. *Lucania parva* (n=23,629) and *Menidia* spp. (n=17,765) were the next most abundant taxa collected, accounting for an additional 11.4% of the total catch. Thirty Selected Taxa (n=22,409 animals) composed 6.2% of the total catch. *Farrantepeneaus duorarum* (n=6,931), *Centropomus undecimalis* (n=2,234), *Cynoscion arenarius* (n=1,881), and *Lutjanus griseus* (n=1,852) were the most abundant Selected Taxa, representing 3.5% of the total catch. *Callinectes sapidus* (n=1,750), *Mugil cephalus* (n=1,532), and *Archosargus*
probatocephalus (n=1,083) were the next most abundant Selected Taxa, comprising an additional 1.2% of the total catch. Collections in 2017 included five species new to the Charlotte Harbor FIM collection: Acanthurus chirurgus (Doctorfish), Dactylopterus volitans (Flying Gurnard), Pareques umbrosus (Cubbyu), Peprius burti (Gulf Butterfish), and Sarotherodon melanotheron (Blackchin Tilapia).

Bay Sampling

21.3-m Bay Seines. A total of 104,395 animals were collected in 408 21.3-m bay seines, representing 28.7% of the overall SRS catch (Table CH17-01). Eucinostomus spp. (n=27,750), Anchoa mitchilli (n=17,255), and L. rhomboides (n=15,669) were the most abundant taxa, accounting for 58.1% of the 21.3-m bay seine catch (Table CH17-02). The taxa most frequently caught in 21.3-m bay seines were Eucinostomus spp. (76.2% occurrence), L. rhomboides (53.9% occurrence), and Eucinostomus gula (53.4% occurrence).

A total of 5,352 animals from 24 Selected Taxa were collected, representing 5.1% of the entire 21.3-m bay seine catch (Table CH17-03). Farfantepenaeus duorarum (n=2,821) was the most abundant Selected Taxa, accounting for 52.7% of the Selected Taxa collected with this gear. The Selected Taxon most frequently caught in 21.3-m bay seines was F. duorarum (46.3% occurrence).

183-m Haul Seines. A total of 43,872 animals were collected in 204 183-m haul seines, representing 12.1% of the total SRS catch (Table CH17-01). Lagodon rhomboides (n=30,385) was the most abundant taxon, accounting for 69.3% of the 183-m haul seine catch (Table CH17-04). The taxa most frequently caught in 183-m haul seines were L. rhomboides (68.1% occurrence) and C. undecimalis (67.6%).

A total of 5,643 animals from 25 Selected Taxa were collected, representing 12.9% of the entire 183-m haul seine catch (Table CH17-05). Lutjanus griseus (n=1,463), C. undecimalis (n=1,405), and A. probatocephalus (n=814) were the most abundant Selected Taxa, accounting for 65.2% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 183-m haul seines were C. undecimalis (67.6% occurrence), A. probatocephalus (59.3% occurrence), and M. cephalus (58.3% occurrence).
6.1-m Bay Otter Trawls. A total of 45,945 animals were collected in 288 6.1-m bay otter trawls, representing 12.6% of the overall SRS catch (Table CH17-01). *Portunus* spp. (n=11,470), *L. rhomboides* (n=10,767), and *Eucinostomus* spp. (n=3,236) were the most abundant taxa collected, accounting for 55.4% of the 6.1-m bay otter trawl catch (Table CH17-06). The taxa most frequently caught in 6.1-m bay otter trawls were *Portunus* spp. (63.2% occurrence), *Prionotus scitulus* (61.5% occurrence), and *F. duorarum* (54.5% occurrence).

A total of 5,506 animals from 16 Selected Taxa were collected, representing 12.0% of the entire 6.1-m bay otter trawl catch (Table CH17-07). *Farfantepenaeus duorarum* (n=2,474) and *C. arenarius* (n=810) were the most abundant Selected Taxa, accounting for 59.6% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 6.1-m bay otter trawls were *F. duorarum* (54.5% occurrence) and *C. sapidus* (31.6% occurrence).

River Sampling

Tidal Creeks

21.3-m River Seines. A total of 96,483 animals were collected in 360 21.3-m river seine samples conducted in tidal creeks, representing 26.6% of the overall SRS catch (Table CH17-01). *Anchoa mitchilli* (n=28,479), *Eucinostomus* spp. (n=22,063), *L. parva* (n=15,982), and *Menidia* spp. (n=9,040) were the most abundant taxa collected, accounting for 78.3% of the 21.3-m river seine catch (Table CH17-08). The taxa most frequently caught in 21.3-m river seines were *Eucinostomus* spp. (80.6% occurrence), *E. harengulus* (67.2% occurrence), and *Menidia* spp. (51.7% occurrence).

A total of 3,106 animals from 14 Selected Taxa were collected, representing 3.2% of the entire 21.3-m river seine catch (Table CH17-09). *Centropomus undecimalis* (n=729), *F. duorarum* (n=702), *Sciaenops ocellatus* (n=468), and *M. cephalus* (n=395) were the most abundant Selected Taxa, accounting for 73.9% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 21.3-m river seines were *C. undecimalis* (34.4% occurrence) and *F. duorarum* (30.6% occurrence).
21.3-m River Seines. A total of 53,660 animals were collected in 144 21.3-m river seine samples conducted in tidal rivers, representing 14.8% of the overall SRS catch (Table CH17-01). *Anchoa mitchilli* (n=39,299) was the most abundant taxon collected, accounting for 73.2% of the 21.3-m river seine catch (Table CH17-10). The taxa most frequently caught in 21.3-m river seines were *Eucinostomus* spp. (66.7% occurrence), *Menidia* spp. (63.2% occurrence), and *E. harengulus* (58.3% occurrence).

A total of 799 animals from 15 Selected Taxa were collected, representing 1.5% of the entire 21.3-m river seine catch (Table CH17-11). *Callinectes sapidus* (n=218), *F. duorarum* (n=202), and *M. cephalus* (n=120) were the most abundant Selected Taxa, accounting for 67.6% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 21.3-m river seines were *F. duorarum* (24.3% occurrence) and *C. sapidus* (21.5% occurrence).

6.1-m River Otter Trawls. A total of 19,040 animals were collected in 72 6.1-m river otter trawls, representing 5.2% of the overall SRS catch (Table CH17-01). *Anchoa mitchilli* (n=12,525) and *Trinectes maculatus* (n=3,042) were the most abundant taxa collected, accounting for 81.8% of the 6.1-m river otter trawl catch (Table CH17-12). The taxa most frequently caught in 6.1-m river otter trawls were *C. sapidus* (80.6% occurrence), *F. duorarum* (63.9% occurrence), and *T. maculatus* (62.5% occurrence).

A total of 2,003 animals from 10 Selected Taxa were collected, representing 10.5% of the entire 6.1-m river otter trawl catch (Table CH17-13). *Cynoscion arenarius* (n=854), *F. duorarum* (n=722), *Callinectes sapidus* (n=238), and *Menticirrhus americanus* (n=167) were the most abundant Selected Taxa, accounting for 98.9% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in the 6.1-m river otter trawls were *C. sapidus* (80.6% occurrence) and *F. duorarum* (63.9% occurrence).
References

Figure CH17-01. Map of Charlotte Harbor sampling area. Zones are labeled A—D, K, M, and P.

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<th>21.3-m river seine</th>
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<td>Animals</td>
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Table CH17-02. Catch statistics for 10 dominant taxa collected in 408 21.3-m bay seine samples during Charlotte Harbor stratified-random sampling, 2017. 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.

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<th>Species</th>
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<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
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CH-48
Table CH17-03. Catch statistics for Selected Taxa collected in 408 21.3-m bay seine samples during Charlotte Harbor stratified-random sampling, 2017. 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>
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<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>2,821</td>
<td>2.7</td>
<td>46.3</td>
<td>4.94</td>
<td>0.81</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>509</td>
<td>0.5</td>
<td>6.4</td>
<td>0.89</td>
<td>0.74</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>363</td>
<td>0.4</td>
<td>20.6</td>
<td>0.64</td>
<td>0.10</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>322</td>
<td>0.3</td>
<td>9.3</td>
<td>0.56</td>
<td>0.18</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>312</td>
<td>0.3</td>
<td>20.8</td>
<td>0.55</td>
<td>0.10</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>290</td>
<td>0.3</td>
<td>2.5</td>
<td>0.51</td>
<td>0.47</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>237</td>
<td>0.2</td>
<td>20.1</td>
<td>0.41</td>
<td>0.06</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>157</td>
<td>0.2</td>
<td>8.6</td>
<td>0.27</td>
<td>0.07</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>116</td>
<td>0.1</td>
<td>13.0</td>
<td>0.20</td>
<td>0.04</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>104</td>
<td>0.1</td>
<td>2.5</td>
<td>0.18</td>
<td>0.11</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>46</td>
<td>&lt;0.1</td>
<td>6.6</td>
<td>0.08</td>
<td>0.02</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>22</td>
<td>&lt;0.1</td>
<td>1.2</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Trachinotus falcatus</td>
<td>15</td>
<td>&lt;0.1</td>
<td>1.0</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Mycteroperca microlepis</td>
<td>11</td>
<td>&lt;0.1</td>
<td>1.7</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Menticirrhus saxatilis</td>
<td>6</td>
<td>&lt;0.1</td>
<td>1.0</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>4</td>
<td>&lt;0.1</td>
<td>1.0</td>
<td>0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Menippe spp.</td>
<td>3</td>
<td>&lt;0.1</td>
<td>0.7</td>
<td>0.01</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
Table CH17-03. (Continued).

<table>
<thead>
<tr>
<th>Species</th>
<th>Number No.</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Menticirrhus littoralis</td>
<td>3</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>0.01</td>
</tr>
<tr>
<td>Trachinotus carolinus</td>
<td>3</td>
<td>&lt;0.1</td>
<td>0.2</td>
<td>0.01</td>
</tr>
<tr>
<td>Lutjanus analis</td>
<td>2</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Mugil trichodon</td>
<td>2</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>2</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Albula vulpes</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Totals</td>
<td>5,352</td>
<td>5.1</td>
<td>9.37</td>
<td>1.28</td>
</tr>
</tbody>
</table>
Table CH17-04. Catch statistics for 10 dominant taxa collected in 204 183-m haul seine samples during Charlotte Harbor stratified-random sampling, 2017. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>30,385</td>
<td>69.3</td>
<td>68.1</td>
<td>148.95</td>
<td>22.79</td>
</tr>
<tr>
<td>Eucinostomus gula</td>
<td>1,625</td>
<td>3.7</td>
<td>49.0</td>
<td>7.97</td>
<td>1.75</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>1,463</td>
<td>3.3</td>
<td>44.1</td>
<td>7.17</td>
<td>2.20</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>1,405</td>
<td>3.2</td>
<td>67.6</td>
<td>6.89</td>
<td>1.01</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>1,053</td>
<td>2.4</td>
<td>26.5</td>
<td>5.16</td>
<td>2.73</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>814</td>
<td>1.9</td>
<td>59.3</td>
<td>3.99</td>
<td>0.61</td>
</tr>
<tr>
<td>Ariopsis felis</td>
<td>805</td>
<td>1.8</td>
<td>35.3</td>
<td>3.95</td>
<td>0.85</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>727</td>
<td>1.7</td>
<td>58.3</td>
<td>3.56</td>
<td>0.50</td>
</tr>
<tr>
<td>Strongylura notata</td>
<td>555</td>
<td>1.3</td>
<td>39.7</td>
<td>2.72</td>
<td>0.84</td>
</tr>
<tr>
<td>Diapterus auratus</td>
<td>519</td>
<td>1.2</td>
<td>27.0</td>
<td>2.54</td>
<td>0.64</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
<td>39,351</td>
<td>89.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>43,872</td>
<td>100.0</td>
<td></td>
<td>215.06</td>
<td>24.98</td>
</tr>
</tbody>
</table>
Table CH17-05. Catch statistics for Selected Taxa collected in 204 183-m haul seine samples during Charlotte Harbor stratified-random sampling, 2017. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>1,463</td>
<td>3.3</td>
<td>44.1</td>
<td>7.17</td>
<td>2.20</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>1,405</td>
<td>3.2</td>
<td>67.6</td>
<td>6.89</td>
<td>1.01</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>814</td>
<td>1.9</td>
<td>59.3</td>
<td>3.99</td>
<td>0.61</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>727</td>
<td>1.7</td>
<td>58.3</td>
<td>3.56</td>
<td>0.50</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>305</td>
<td>0.7</td>
<td>29.4</td>
<td>1.50</td>
<td>0.61</td>
</tr>
<tr>
<td>Mugil trichodon</td>
<td>161</td>
<td>0.4</td>
<td>20.6</td>
<td>0.79</td>
<td>0.17</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>100</td>
<td>0.2</td>
<td>22.1</td>
<td>0.49</td>
<td>0.11</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>98</td>
<td>0.2</td>
<td>9.3</td>
<td>0.48</td>
<td>0.18</td>
</tr>
<tr>
<td>Mycterooperca microlepis</td>
<td>94</td>
<td>0.2</td>
<td>10.8</td>
<td>0.46</td>
<td>0.17</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>74</td>
<td>0.2</td>
<td>6.9</td>
<td>0.36</td>
<td>0.18</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>73</td>
<td>0.2</td>
<td>12.7</td>
<td>0.36</td>
<td>0.10</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>73</td>
<td>0.2</td>
<td>11.8</td>
<td>0.36</td>
<td>0.13</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>72</td>
<td>0.2</td>
<td>15.7</td>
<td>0.35</td>
<td>0.07</td>
</tr>
<tr>
<td>Paralichthys albigna</td>
<td>58</td>
<td>0.1</td>
<td>16.2</td>
<td>0.28</td>
<td>0.06</td>
</tr>
<tr>
<td>Trachinotus falcatus</td>
<td>47</td>
<td>0.1</td>
<td>6.9</td>
<td>0.23</td>
<td>0.09</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>31</td>
<td>0.1</td>
<td>5.4</td>
<td>0.15</td>
<td>0.06</td>
</tr>
<tr>
<td>Farfantepenea duorarum</td>
<td>10</td>
<td>&lt;0.1</td>
<td>3.4</td>
<td>0.05</td>
<td>0.02</td>
</tr>
</tbody>
</table>
Table CH17-05.  (Continued).

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td><em>Trachinotus carolinus</em></td>
<td>9</td>
<td>&lt;0.1</td>
<td>3.9</td>
<td>0.04</td>
</tr>
<tr>
<td><em>Lutjanus analis</em></td>
<td>8</td>
<td>&lt;0.1</td>
<td>2.5</td>
<td>0.04</td>
</tr>
<tr>
<td><em>Scomberomorus maculatus</em></td>
<td>7</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>0.03</td>
</tr>
<tr>
<td><em>Menticirrhus americanus</em></td>
<td>5</td>
<td>&lt;0.1</td>
<td>1.5</td>
<td>0.02</td>
</tr>
<tr>
<td><em>Megalops atlanticus</em></td>
<td>3</td>
<td>&lt;0.1</td>
<td>1.5</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Albula vulpes</em></td>
<td>3</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Pomatomus saltatrix</em></td>
<td>2</td>
<td>&lt;0.1</td>
<td>1.0</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Menippe sp.</em></td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>5,643</strong></td>
<td><strong>12.9</strong></td>
<td><strong>27.66</strong></td>
<td><strong>3.24</strong></td>
</tr>
</tbody>
</table>
Table CH17-06. Catch statistics for 10 dominant taxa collected in 288 6.1-m bay otter trawl samples during Charlotte Harbor stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number No.</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Portunus spp.</td>
<td>11,470</td>
<td>25.0</td>
<td>63.2</td>
<td>2.78</td>
<td>0.50</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>10,767</td>
<td>23.4</td>
<td>40.6</td>
<td>2.58</td>
<td>0.42</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>3,236</td>
<td>7.0</td>
<td>29.5</td>
<td>0.76</td>
<td>0.24</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>2,474</td>
<td>5.4</td>
<td>54.5</td>
<td>0.58</td>
<td>0.12</td>
</tr>
<tr>
<td>Eucinostomus gula</td>
<td>2,113</td>
<td>4.6</td>
<td>38.2</td>
<td>0.50</td>
<td>0.08</td>
</tr>
<tr>
<td>Trinectes maculatus</td>
<td>1,539</td>
<td>3.4</td>
<td>33.7</td>
<td>0.36</td>
<td>0.15</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>1,440</td>
<td>3.1</td>
<td>8.3</td>
<td>0.34</td>
<td>0.18</td>
</tr>
<tr>
<td>Prionotus scitulus</td>
<td>1,405</td>
<td>3.1</td>
<td>61.5</td>
<td>0.33</td>
<td>0.04</td>
</tr>
<tr>
<td>Orthopristis chrysoptera</td>
<td>1,262</td>
<td>2.8</td>
<td>28.8</td>
<td>0.30</td>
<td>0.06</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>810</td>
<td>1.8</td>
<td>10.4</td>
<td>0.19</td>
<td>0.06</td>
</tr>
<tr>
<td>Subtotals</td>
<td>36,516</td>
<td>79.5</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Totals</td>
<td>45,945</td>
<td>100.0</td>
<td>10.98</td>
<td>0.91</td>
<td>140.55</td>
</tr>
</tbody>
</table>
Table CH17-07. Catch statistics for Selected Taxa collected in 288 6.1-m bay otter trawl samples during Charlotte Harbor stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>2,474</td>
<td>5.4</td>
<td>54.5</td>
<td>0.58</td>
<td>0.12</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>810</td>
<td>1.8</td>
<td>10.4</td>
<td>0.19</td>
<td>0.06</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>620</td>
<td>1.4</td>
<td>15.6</td>
<td>0.15</td>
<td>0.05</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>556</td>
<td>1.2</td>
<td>25.0</td>
<td>0.13</td>
<td>0.02</td>
</tr>
<tr>
<td>Menippe spp.</td>
<td>447</td>
<td>1.0</td>
<td>29.2</td>
<td>0.11</td>
<td>0.02</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>374</td>
<td>0.8</td>
<td>31.6</td>
<td>0.09</td>
<td>0.01</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>64</td>
<td>0.1</td>
<td>5.2</td>
<td>0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>49</td>
<td>0.1</td>
<td>13.2</td>
<td>0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>48</td>
<td>0.1</td>
<td>5.6</td>
<td>0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>26</td>
<td>0.1</td>
<td>3.5</td>
<td>0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Mycterooperca microlepis</td>
<td>18</td>
<td>&lt;0.1</td>
<td>1.7</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Epinephelus morio</td>
<td>6</td>
<td>&lt;0.1</td>
<td>1.4</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Menticirrhus saxatilis</td>
<td>5</td>
<td>&lt;0.1</td>
<td>1.0</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Menticirrhus littoralis</td>
<td>5</td>
<td>&lt;0.1</td>
<td>0.7</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Leistomus xanthurus</td>
<td>3</td>
<td>&lt;0.1</td>
<td>1.0</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.3</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>5,506</strong></td>
<td><strong>12.0</strong></td>
<td><strong>1.30</strong></td>
<td><strong>0.19</strong></td>
<td><strong>247.56</strong></td>
</tr>
</tbody>
</table>
Table CH17-08. Catch statistics for 10 dominant taxa collected in 360 21.3-m river seine samples conducted in tidal creeks during Charlotte Harbor stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number No.</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>28,479</td>
<td>29.5</td>
<td>22.2</td>
<td>116.34</td>
<td>48.66</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>22,063</td>
<td>22.9</td>
<td>80.6</td>
<td>90.13</td>
<td>10.23</td>
</tr>
<tr>
<td>Lucania parva</td>
<td>15,982</td>
<td>16.6</td>
<td>44.7</td>
<td>65.29</td>
<td>13.61</td>
</tr>
<tr>
<td>Menidia spp.</td>
<td>9,040</td>
<td>9.4</td>
<td>51.7</td>
<td>36.93</td>
<td>6.39</td>
</tr>
<tr>
<td>Microgobius gulosus</td>
<td>3,124</td>
<td>3.2</td>
<td>47.5</td>
<td>12.76</td>
<td>2.75</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>2,850</td>
<td>3.0</td>
<td>67.2</td>
<td>11.64</td>
<td>1.24</td>
</tr>
<tr>
<td>Gambusia holbrooki</td>
<td>2,456</td>
<td>2.6</td>
<td>8.9</td>
<td>10.03</td>
<td>5.78</td>
</tr>
<tr>
<td>Poecilia latipinna</td>
<td>2,147</td>
<td>2.2</td>
<td>7.8</td>
<td>8.77</td>
<td>5.20</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>1,436</td>
<td>1.5</td>
<td>25.0</td>
<td>5.87</td>
<td>1.69</td>
</tr>
<tr>
<td>Eugerres plumieri</td>
<td>1,253</td>
<td>1.3</td>
<td>37.2</td>
<td>5.12</td>
<td>1.21</td>
</tr>
<tr>
<td>Subtotals</td>
<td>88,830</td>
<td>92.1</td>
<td>.</td>
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<td>.</td>
</tr>
<tr>
<td>Totals</td>
<td>96,483</td>
<td>100.0</td>
<td>394.13</td>
<td>56.10</td>
<td>270.06</td>
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</tbody>
</table>
Table CH17-09. Catch statistics for Selected Taxa collected in 360 21.3-m river seine samples conducted in tidal creeks during Charlotte Harbor stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number No.</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td><em>Centropomus undecimalis</em></td>
<td>729</td>
<td>0.8</td>
<td>34.4</td>
<td>2.98</td>
<td>0.62</td>
</tr>
<tr>
<td><em>Farfantepenaeus duorarum</em></td>
<td>702</td>
<td>0.7</td>
<td>30.6</td>
<td>2.87</td>
<td>0.52</td>
</tr>
<tr>
<td><em>Sciaenops ocellatus</em></td>
<td>468</td>
<td>0.5</td>
<td>16.7</td>
<td>1.91</td>
<td>0.48</td>
</tr>
<tr>
<td><em>Mugil cephalus</em></td>
<td>395</td>
<td>0.4</td>
<td>6.4</td>
<td>1.61</td>
<td>1.07</td>
</tr>
<tr>
<td><em>Callinectes sapidus</em></td>
<td>303</td>
<td>0.3</td>
<td>22.5</td>
<td>1.24</td>
<td>0.22</td>
</tr>
<tr>
<td><em>Archosargus probatocephalus</em></td>
<td>112</td>
<td>0.1</td>
<td>16.9</td>
<td>0.46</td>
<td>0.07</td>
</tr>
<tr>
<td><em>Cynoscion arenarius</em></td>
<td>92</td>
<td>0.1</td>
<td>4.4</td>
<td>0.38</td>
<td>0.20</td>
</tr>
<tr>
<td><em>Mugil trichodon</em></td>
<td>89</td>
<td>0.1</td>
<td>2.8</td>
<td>0.36</td>
<td>0.28</td>
</tr>
<tr>
<td><em>Cynoscion nebulosus</em></td>
<td>80</td>
<td>0.1</td>
<td>9.2</td>
<td>0.33</td>
<td>0.10</td>
</tr>
<tr>
<td><em>Lutjanus griseus</em></td>
<td>53</td>
<td>0.1</td>
<td>9.4</td>
<td>0.22</td>
<td>0.04</td>
</tr>
<tr>
<td><em>Leiostomus xanthurus</em></td>
<td>46</td>
<td>0.1</td>
<td>2.5</td>
<td>0.19</td>
<td>0.08</td>
</tr>
<tr>
<td><em>Mugil curema</em></td>
<td>31</td>
<td>&lt;0.1</td>
<td>1.4</td>
<td>0.13</td>
<td>0.10</td>
</tr>
<tr>
<td><em>Elops saurus</em></td>
<td>5</td>
<td>&lt;0.1</td>
<td>0.8</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Megalops atlanticus</em></td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.3</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>3,106</strong></td>
<td><strong>3.2</strong>:</td>
<td>.</td>
<td><strong>12.69</strong></td>
<td><strong>1.67</strong></td>
</tr>
</tbody>
</table>
Table CH17-10. Catch statistics for 10 dominant taxa collected in 144 21.3-m river seine samples conducted in tidal rivers during Charlotte Harbor stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Occur</td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>39,299</td>
<td>73.2</td>
<td>38.9</td>
<td>401.34</td>
<td>118.28</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>6,489</td>
<td>12.1</td>
<td>66.7</td>
<td>66.27</td>
<td>21.77</td>
</tr>
<tr>
<td>Menidia spp.</td>
<td>2,476</td>
<td>4.6</td>
<td>63.2</td>
<td>25.29</td>
<td>4.05</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>2,104</td>
<td>3.9</td>
<td>58.3</td>
<td>21.49</td>
<td>4.86</td>
</tr>
<tr>
<td>Eugerres plumieri</td>
<td>532</td>
<td>1.0</td>
<td>25.7</td>
<td>5.43</td>
<td>1.72</td>
</tr>
<tr>
<td>Microgobius gulosus</td>
<td>289</td>
<td>0.5</td>
<td>36.8</td>
<td>2.95</td>
<td>0.64</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>218</td>
<td>0.4</td>
<td>21.5</td>
<td>2.23</td>
<td>0.83</td>
</tr>
<tr>
<td>Farfantenpenaeus duorarum</td>
<td>202</td>
<td>0.4</td>
<td>24.3</td>
<td>2.06</td>
<td>0.56</td>
</tr>
<tr>
<td>Fundulus similis</td>
<td>185</td>
<td>0.3</td>
<td>3.5</td>
<td>1.89</td>
<td>1.26</td>
</tr>
<tr>
<td>Eucinostomus gula</td>
<td>171</td>
<td>0.3</td>
<td>11.1</td>
<td>1.75</td>
<td>0.64</td>
</tr>
<tr>
<td>Subtotals</td>
<td>51,965</td>
<td>96.8</td>
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<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Totals</td>
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<td>.</td>
<td>548.00</td>
<td>121.15</td>
</tr>
<tr>
<td>Species</td>
<td>Number</td>
<td>%</td>
<td>% Occur</td>
<td>Density Estimate (animals/100m²)</td>
<td>Standard Length (mm)</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------</td>
<td>---</td>
<td>---------</td>
<td>---------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>218</td>
<td>0.4</td>
<td>21.5</td>
<td>2.23</td>
<td>0.83</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>202</td>
<td>0.4</td>
<td>24.3</td>
<td>2.06</td>
<td>0.56</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>120</td>
<td>0.2</td>
<td>9.0</td>
<td>1.23</td>
<td>0.67</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>79</td>
<td>0.2</td>
<td>10.4</td>
<td>0.81</td>
<td>0.33</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>54</td>
<td>0.1</td>
<td>13.2</td>
<td>0.55</td>
<td>0.21</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>35</td>
<td>0.1</td>
<td>12.5</td>
<td>0.36</td>
<td>0.12</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>21</td>
<td>&lt;0.1</td>
<td>4.2</td>
<td>0.21</td>
<td>0.11</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>21</td>
<td>&lt;0.1</td>
<td>3.5</td>
<td>0.21</td>
<td>0.13</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>16</td>
<td>&lt;0.1</td>
<td>3.5</td>
<td>0.16</td>
<td>0.12</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>15</td>
<td>&lt;0.1</td>
<td>1.4</td>
<td>0.15</td>
<td>0.14</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>14</td>
<td>&lt;0.1</td>
<td>7.6</td>
<td>0.14</td>
<td>0.05</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.7</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.7</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.7</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Mugil trichodon</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.7</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Totals</td>
<td>799</td>
<td>1.5</td>
<td></td>
<td>8.16</td>
<td>1.47</td>
</tr>
</tbody>
</table>
Table CH17-12. Catch statistics for 10 dominant taxa collected in 72 6.1-m river otter trawl samples during Charlotte Harbor stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>12,525</td>
<td>65.8</td>
<td>44.4</td>
<td>23.47</td>
<td>13.52</td>
</tr>
<tr>
<td>Trinectes maculatus</td>
<td>3,042</td>
<td>16.0</td>
<td>62.5</td>
<td>5.70</td>
<td>2.43</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>854</td>
<td>4.5</td>
<td>37.5</td>
<td>1.60</td>
<td>0.71</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>722</td>
<td>3.8</td>
<td>63.9</td>
<td>1.35</td>
<td>0.67</td>
</tr>
<tr>
<td>Ariopsis felis</td>
<td>464</td>
<td>2.4</td>
<td>33.3</td>
<td>0.87</td>
<td>0.30</td>
</tr>
<tr>
<td>Bairdiella chrysoura</td>
<td>399</td>
<td>2.1</td>
<td>12.5</td>
<td>0.75</td>
<td>0.54</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>238</td>
<td>1.3</td>
<td>80.6</td>
<td>0.45</td>
<td>0.06</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>167</td>
<td>0.9</td>
<td>38.9</td>
<td>0.31</td>
<td>0.09</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>110</td>
<td>0.6</td>
<td>16.7</td>
<td>0.21</td>
<td>0.10</td>
</tr>
<tr>
<td>Achirus lineatus</td>
<td>69</td>
<td>0.4</td>
<td>6.9</td>
<td>0.13</td>
<td>0.10</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
<td>18,590</td>
<td>97.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>19,040</td>
<td>100.0</td>
<td>35.68</td>
<td>13.73</td>
<td>326.42</td>
</tr>
</tbody>
</table>
Table CH17-13. Catch statistics for Selected Taxa collected in 72 6.1-m river otter trawl samples during Charlotte Harbor stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>854</td>
<td>4.5</td>
<td>37.5</td>
<td>1.60</td>
<td>0.71</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>722</td>
<td>3.8</td>
<td>63.9</td>
<td>1.35</td>
<td>0.67</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>238</td>
<td>1.3</td>
<td>80.6</td>
<td>0.45</td>
<td>0.06</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>167</td>
<td>0.9</td>
<td>38.9</td>
<td>0.31</td>
<td>0.09</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>9</td>
<td>0.1</td>
<td>8.3</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>7</td>
<td>&lt;0.1</td>
<td>4.2</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>3</td>
<td>&lt;0.1</td>
<td>4.2</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>1.4</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Menticirrhus saxatilis</td>
<td>1</td>
<td>&lt;0.1</td>
<td>1.4</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>1.4</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Totals</td>
<td>2,003</td>
<td>10.5</td>
<td>.</td>
<td>3.75</td>
<td>1.42</td>
</tr>
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Appendix CH17-01. Monthly summary of species collected during Charlotte Harbor stratified-random sampling, 2017. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

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Appendix CH17-02. Summary by gear and stratum of species collected during Charlotte Harbor stratified-random sampling, 2017. 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.

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<th>21.3-m bay seine</th>
<th>21.3-m river seine</th>
<th>183-m haul seine</th>
<th>6.1-m otter trawl</th>
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CH-72
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CH-73
| Species                  | Gear and Strata |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |          |
|--------------------------|-----------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|                          | 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=149 | E=55 | E=204 | E=422 | E=82 | E=156 | E=48 | E=360 | E=1,476 |
| Elops saurus             | 1    | .     | .     | 6    |         | .    | 51      | 22      | .       |        |      |      |      |      |      |      |      |      |        |
| Epinephelus morio       | .    | .     | .     | .    |         | .    | .       | 6       | .       |        |      |      |      |      |      |      |      |      |        |
| Etropus cossotus        | 1    | .     | .     | .    |         | .    | .       |         | 187     |        |      |      |      |      |      |      |      |      |        |
| Eucinostomus gula       | 1,124 | 276   | 3,221 | 651  | 113     | 1,168 | 457     | 2,116   | 9,128   |        |      |      |      |      |      |      |      |      |        |
| Eucinostomus harenegulus| 86   | 132   | 2,033 | 3,904 | 1,050   | 950  | 103     | 296     | 8,554   |        |      |      |      |      |      |      |      |      |        |
| Eucinostomus harenegulus| 8,827 | 2,200 | 16,723 | 25,657 | 2,895   | .     | .       | 3,273   | 59,575  |        |      |      |      |      |      |      |      |      |        |
| Eucinostomus harenegulus| 17   | 7     | 146   | 1,397 | 388     | 356  | 4       | 32      | 2,347   |        |      |      |      |      |      |      |      |      |        |
| Farfantepenaeus duorarum| 1,480 | 125   | 1,216 | 800   | 104     | 6    | 4       | 3,196   | 6,931   |        |      |      |      |      |      |      |      |      |        |
| Fistularia tabacaria     | .    | .     | .     | .    |         | .    | .       | 1       | 1       |        |      |      |      |      |      |      |      |      |        |
| Floridichthys carpio    | 85   | 1     | 692   | 358   | 14      | .    | .       | .       | 1,150   |        |      |      |      |      |      |      |      |      |        |
| Fundulus confluentus    | 2    | .     | .     | 54   |         | .    | .       | .       | 56      |        |      |      |      |      |      |      |      |      |        |
| Fundulus grandis        | 1    | .     | 108   | 113   | 12      | 2    | .       | .       | 236     |        |      |      |      |      |      |      |      |      |        |
| Fundulus semifinolisis  | .    | .     | .     | 1    |         | .    | .       | .       | 1       |        |      |      |      |      |      |      |      |      |        |
| Fundulus similis        | 1    | 2     | 134   | 1     | 185     | .    | .       | .       | 323     |        |      |      |      |      |      |      |      |      |        |
| Gambusia holbrooki      | 1    | .     | 2     | 2,509 | 50      | .    | .       | .       | 2,562   |        |      |      |      |      |      |      |      |      |        |
| Gerreidae spp.          | .    | .     | .     | 10    | .       | .    | 3       | .       | 13      |        |      |      |      |      |      |      |      |      |        |
| Gerres cinereus         | .    | .     | .     | .    |         | .    | 18      | 6       | 24      |        |      |      |      |      |      |      |      |      |        |
| Ginglymostoma cirratum  | .    | .     | .     | .    |         | .    | 2       | .       | 2       |        |      |      |      |      |      |      |      |      |        |
| Gobiesox strumosus      | 4    | 7     | 8     | 10    | 7       | .    | .       | 5       | 41      |        |      |      |      |      |      |      |      |      |        |
| Gobionellus oceanicus   | .    | .     | .     | 5    | 1       | .    | .       | 2       | 8       |        |      |      |      |      |      |      |      |      |        |
| Gobiosoma bosc          | 1    | 4     | 16    | 59    | 8       | .    | .       | 15      | 103     |        |      |      |      |      |      |      |      |      |        |
| Gobiosoma longipala     | 1    | .     | .     | .    |         | .    | .       | 86      | 87      |        |      |      |      |      |      |      |      |      |        |
| Gobiosoma robustum      | 395  | 8     | 299   | 190   | 6       | .    | .       | 175     | 1,073   |        |      |      |      |      |      |      |      |      |        |
| Gobiosoma spp.          | 91   | 10    | 78    | 238   | 17      | .    | .       | 155     | 589     |        |      |      |      |      |      |      |      |      |        |
| Gymnura micrura         | .    | .     | .     | .    |         | .    | 2       | 3       | 2       | 7       |      |      |      |      |      |      |      |      |          |
| Haemulon aurolineatam   | .    | .     | .     | .    |         | .    | .       | .       | 2       | 2       |      |      |      |      |      |      |      |      |          |
| Haemulon plumierii      | 11   | .     | 1     | .    |         | .    | 20      | 36      | 24      | 92      |      |      |      |      |      |      |      |      |          |
| Haemulon sciurus        | .    | .     | .     | .    |         | .    | 1       | .       | 1       | 1       |      |      |      |      |      |      |      |      |          |
| Halichoeres bivittatus  | .    | .     | 9     | .    |         | .    | .       | .       | 1       | 10      |      |      |      |      |      |      |      |      |          |
| Harengula jaguana       | 3,399 | 3,736 | 496   | 35    | 19      | 39   | 7,664   |        |        |        |      |      |      |      |      |      |      |      |          |
| Hemichromis lotourneuxi | .    | .     | 2     | 9    | .       | .    | .       | .       | 11      |        |      |      |      |      |      |      |      |      |          |
| Hemiramphus brasiliensis| .    | .     | .     | .    |         | .    | 5       | .       | 5       |        |      |      |      |      |      |      |      |      |          |
| Hippocampus erectus     | 1    | .     | 1     | 1    | 1       | 4    | .       | 89      | 97      |        |      |      |      |      |      |      |      |      |          |
Appendix CH17-02. (Continued).

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Appendix CH17-03. Summary by zone of species collected during Charlotte Harbor stratified-random sampling, 2017. Zones A-D were located in Charlotte Harbor, while Zones K (Alligator Creek), M (Myakka River) and P (Peace River) represent tributaries of Charlotte Harbor. Effort, or the total number of hauls, is labeled ‘E’. Taxa are arranged alphabetically.

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

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in the northern IRL since 1990. The area sampled was divided into six geographically-defined bay zones (A – E, and H) and one riverine zone that includes Turkey Creek and St. Sebastian River (F; Figure IR17-01). Monthly stratified-random sampling (SRS) was conducted in Zones C, D, and H using 21.3-m bay and 183-m haul seines. Zone H was also sampled monthly with 6.1-m bay otter trawls. Monthly SRS was conducted in Zone E with only 183-m haul seines. Zone F was sampled monthly with 21.3-m river seines. Zones A, B, and E were sampled seasonally (October and November) with 21.3-m bay seines. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2017 in the northern IRL.

**Stratified-Random Sampling**

A total of 337,283 animals, which included 169 taxa of fishes and 14 taxa of selected invertebrates, were collected from 824 northern IRL samples in 2017 (Table IR17-01; Appendices IR17-01, -02, and -03). *Anchoa mitchilli* (n=219,320) was the most numerous species collected, representing 65.0% of the total catch. The two next most
abundant taxa, *Eucinostomus* spp. (n=23,812) and *Diapterus auratus* (n=14,881) accounted for an additional 11.5% of the total catch. Thirty Selected Taxa (n=19,469 animals) composed 5.8% of the total catch. *Mugil curema* (n=5,642) was the most abundant Selected Taxa, representing 1.7% of the total catch. *Mugil cephalus* (n=2,699) and *Micropogonias undulatus* (n=2,222) were the next most abundant Selected Taxa, accounting for an additional 1.5% of the total catch. Collections in 2017 included six species new to the northern IRL FIM collection: *Calamus bajonado* (Jolthead Porgy); *Callinectes exasperatus* (Rugose Swimming Crab); *Elacatinus macrodon* (Tiger Goby); *Haemulon flavolineatum* (French Grunt); *Harengula humeralis* (Redear Sardine); and *Syacium* spp. (Unidentified Syacium).

**Bay Sampling**

21.3-m *Bay Seines*. A total of 219,016 animals were collected in 380 21.3-m bay seines, representing 64.9% of the overall SRS catch (Table IR17-01). *Anchoa mitchilli* (n=178,342) was the most abundant species, accounting for 81.4% of the 21.3-m bay seine catch (Table IR17-02). The taxa most frequently caught in the 21.3-m bay seines were *A. mitchilli* (49.5% occurrence), *Eucinostomus* spp. (47.6% occurrence), *D. auratus* (33.9% occurrence), and *Gobiosoma* spp. (33.7% occurrence).

A total of 3,498 animals from 28 Selected Taxa were collected, representing 1.6% of the entire 21.3-m bay seine catch (Table IR17-03). *Sciaenops ocellatus* (n=693) and *Farfantepenaeus* spp. (n=583) were the most abundant Selected Taxa, accounting for 36.5% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 21.3-m bay seines were *Farfantepenaeus* spp. (25.5% occurrence) and *Cynoscion nebulosus* (21.1% occurrence).

183-m *Haul Seines*. A total of 42,188 animals were collected in 228 183-m haul seines, representing 12.5% of the overall SRS catch (Table IR17-01). *Diapterus auratus* (n=8,734), *M. curema* (n=5,227), *Bairdiella chrysoura* (n=4,415), and *Ariopsis felis* (n=4,321) were the most abundant species, accounting for 53.8% of the 183-m haul seine catch (Table IR17-04). The taxa most frequently caught in the 183-m haul seines were *M. curema* (79.8% occurrence), *A. felis* (73.7% occurrence), and *M. cephalus* (70.6% occurrence).
A total of 11,368 animals from 28 Selected Taxa were collected, representing 26.9% of the entire 183-m haul seine catch (Table IR17-05). *Mugil curema* (n=5,227), *M. cephalus* (n=2,452), and *Pogonias cromis* (n=1,034) were the most abundant Selected Taxa, accounting for 76.6% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in the 183-m haul seines were *M. curema* (79.8% occurrence) and *M. cephalus* (70.6% occurrence).

6.1-m Bay Otter Trawl. A total of 13,380 animals were collected in 96 6.1-m bay otter trawls, representing 4.0% of the overall SRS catch (Table IR17-01). *Anchoa mitchilli* (n=3,442), *Eucinostomus* spp. (n=2,052), and *Gobiosoma* spp. (n=1,259) were the most abundant taxa, accounting for 50.5% of the 6.1-m bay otter trawl catch (Table IR17-06). The taxa most frequently caught in 6.1-m bay otter trawls were *Farfantepenaeus* spp. (77.1% occurrence), *Gobiosoma* spp. (65.6% occurrence), and *Eucinostomus* spp. (62.5% occurrence).

A total of 1,710 animals from 20 Selected Taxa were collected, representing 12.8% of the entire 6.1-m bay otter trawl catch (Table IR17-07). *Farfantepenaeus* spp. (n=679), *M. undulatus* (n=252), and *Callinectes sapidus* (n=199) were the most abundant Selected Taxa, accounting for 66.1% of the Selected Taxa collected in this gear. The Selected Taxa most frequently caught in the 6.1-m bay otter trawl were *Farfantepenaeus* spp. (77.1% occurrence) and *C. sapidus* (61.5% occurrence).

**River Sampling**

21.3-m River Seine. A total of 62,699 animals were collected in 120 21.3-m river seines, representing 18.6% of the overall SRS collections (Table IR17-01). *Anchoa mitchilli* (n=37,536) was the most abundant species collected, accounting for 59.9% of the 21.3-m river seine catch (Table IR17-08). The taxa most frequently caught in 21.3-m river seines were *Eucinostomus* spp. (75.8% occurrence) and *D. auratus* (70.0% occurrence).

A total of 2,893 animals from 18 Selected Taxa were collected, representing 4.6% of the entire 21.3-m river seine catch (Table IR17-09). *Micropogonias undulatus* (n=1,614) and *Centropomus undecimalis* (n=531) were the most abundant Selected Taxa, accounting for 74.2% of the Selected Taxa collected in this gear. The Selected
Taxa most frequently caught in 21.3-m river seines were *Centropomus undecimalis* (54.2% occurrence), *Callinectes sapidus* (31.7% occurrence), and *Farfantepenaeus* spp. (24.2% occurrence).
References


Figure IR17-01. Map of the northern Indian River Lagoon sampling area. Zones are labeled A–F, and H.
Table IR17-01. Summary of catch and effort data for northern Indian River Lagoon stratified-random sampling, 2017.

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<td>120</td>
<td>9,363</td>
<td>48</td>
<td>138,528</td>
</tr>
<tr>
<td>D</td>
<td>5,070</td>
<td>96</td>
<td>9,473</td>
<td>72</td>
<td>14,543</td>
</tr>
<tr>
<td>E</td>
<td>3,079</td>
<td>14</td>
<td>8,276</td>
<td>48</td>
<td>11,355</td>
</tr>
<tr>
<td>F</td>
<td>.</td>
<td>.</td>
<td>62,699</td>
<td>120</td>
<td>62,699</td>
</tr>
<tr>
<td>H</td>
<td>65,621</td>
<td>120</td>
<td>15,076</td>
<td>60</td>
<td>94,077</td>
</tr>
<tr>
<td></td>
<td>219,016</td>
<td>380</td>
<td>62,699</td>
<td>120</td>
<td>42,188</td>
</tr>
</tbody>
</table>
Table IR17-02. Catch statistics for 10 dominant taxa collected in 380 21.3-m bay seine samples during northern Indian River Lagoon stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>178,342</td>
<td>81.4</td>
<td>49.5</td>
<td>335.23</td>
<td>94.65</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>12,093</td>
<td>5.5</td>
<td>47.6</td>
<td>22.73</td>
<td>7.54</td>
</tr>
<tr>
<td>Harengula jaguana</td>
<td>6,199</td>
<td>2.8</td>
<td>7.9</td>
<td>11.65</td>
<td>4.61</td>
</tr>
<tr>
<td>Diapterus auratus</td>
<td>2,933</td>
<td>1.3</td>
<td>33.9</td>
<td>5.51</td>
<td>1.71</td>
</tr>
<tr>
<td>Bairdiella chrysoura</td>
<td>2,493</td>
<td>1.1</td>
<td>20.8</td>
<td>4.69</td>
<td>1.33</td>
</tr>
<tr>
<td>Menidia spp.</td>
<td>1,715</td>
<td>0.8</td>
<td>17.9</td>
<td>3.22</td>
<td>1.14</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>1,328</td>
<td>0.6</td>
<td>26.6</td>
<td>2.50</td>
<td>0.49</td>
</tr>
<tr>
<td>Gobiosoma spp.</td>
<td>1,141</td>
<td>0.5</td>
<td>33.7</td>
<td>2.14</td>
<td>0.40</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>1,079</td>
<td>0.5</td>
<td>12.6</td>
<td>2.03</td>
<td>0.88</td>
</tr>
<tr>
<td>Anchoa lyolepis</td>
<td>970</td>
<td>0.4</td>
<td>2.4</td>
<td>1.82</td>
<td>1.77</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
<td>208,293</td>
<td>95.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>219,016</td>
<td>100.0</td>
<td></td>
<td>411.68</td>
<td>96.49</td>
</tr>
</tbody>
</table>
Table IR17-03. Catch statistics for Selected Taxa collected in 380 21.3-m bay seine samples during northern Indian River Lagoon stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number No.</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>693</td>
<td>0.3</td>
<td>13.7</td>
<td>1.30</td>
<td>0.73</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>583</td>
<td>0.3</td>
<td>25.5</td>
<td>1.10</td>
<td>0.23</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>368</td>
<td>0.2</td>
<td>17.9</td>
<td>0.69</td>
<td>0.16</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>325</td>
<td>0.2</td>
<td>6.1</td>
<td>0.61</td>
<td>0.39</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>320</td>
<td>0.2</td>
<td>5.3</td>
<td>0.60</td>
<td>0.32</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>256</td>
<td>0.1</td>
<td>21.1</td>
<td>0.48</td>
<td>0.10</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>226</td>
<td>0.1</td>
<td>14.2</td>
<td>0.42</td>
<td>0.14</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>210</td>
<td>0.1</td>
<td>5.3</td>
<td>0.39</td>
<td>0.21</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>68</td>
<td>&lt;0.1</td>
<td>10.0</td>
<td>0.13</td>
<td>0.03</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>68</td>
<td>&lt;0.1</td>
<td>7.6</td>
<td>0.13</td>
<td>0.03</td>
</tr>
<tr>
<td>Trachinotus falcatus</td>
<td>68</td>
<td>&lt;0.1</td>
<td>5.5</td>
<td>0.13</td>
<td>0.04</td>
</tr>
<tr>
<td>Cynoscion complex</td>
<td>65</td>
<td>&lt;0.1</td>
<td>5.3</td>
<td>0.12</td>
<td>0.05</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>59</td>
<td>&lt;0.1</td>
<td>2.9</td>
<td>0.11</td>
<td>0.06</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>50</td>
<td>&lt;0.1</td>
<td>7.9</td>
<td>0.09</td>
<td>0.02</td>
</tr>
<tr>
<td>Albula vulpes</td>
<td>31</td>
<td>&lt;0.1</td>
<td>2.9</td>
<td>0.06</td>
<td>0.02</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>30</td>
<td>&lt;0.1</td>
<td>2.6</td>
<td>0.06</td>
<td>0.04</td>
</tr>
<tr>
<td>Lutjanus analis</td>
<td>17</td>
<td>&lt;0.1</td>
<td>1.3</td>
<td>0.03</td>
<td>0.02</td>
</tr>
</tbody>
</table>
Table IR17-03. (Continued).

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>13</td>
<td>&lt;0.1</td>
<td>1.8</td>
<td>0.02</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>10</td>
<td>&lt;0.1</td>
<td>2.4</td>
<td>0.02</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>8</td>
<td>&lt;0.1</td>
<td>2.1</td>
<td>0.02</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>7</td>
<td>&lt;0.1</td>
<td>1.3</td>
<td>0.01</td>
</tr>
<tr>
<td>Farfantepenaeus azteceus</td>
<td>6</td>
<td>&lt;0.1</td>
<td>1.3</td>
<td>0.01</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>5</td>
<td>&lt;0.1</td>
<td>0.8</td>
<td>0.01</td>
</tr>
<tr>
<td>Mugil trichodon</td>
<td>5</td>
<td>&lt;0.1</td>
<td>0.3</td>
<td>0.01</td>
</tr>
<tr>
<td>Mugil rubrioculus</td>
<td>3</td>
<td>&lt;0.1</td>
<td>0.8</td>
<td>0.01</td>
</tr>
<tr>
<td>Menippe sp.</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.3</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Megalops atlantisicus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.3</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Pomatomus saltatrix</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.3</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Lutjanus apodus</td>
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<td>&lt;0.1</td>
<td>0.3</td>
<td>&lt;0.01</td>
</tr>
<tr>
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<td>.</td>
<td>6.58</td>
</tr>
</tbody>
</table>
Table IR17-04.  Catch statistics for 10 dominant taxa collected in 228 183-m haul seine samples during northern Indian River Lagoon stratified-random sampling, 2017.  Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean.  Taxa are ranked in order of decreasing mean catch-per-unit-effort.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Diapterus auratus</td>
<td>8,734</td>
<td>20.7</td>
<td>38.31</td>
<td>5.81</td>
<td>228.97</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>5,227</td>
<td>12.4</td>
<td>22.93</td>
<td>7.13</td>
<td>469.72</td>
</tr>
<tr>
<td>Bairdiella chrysoura</td>
<td>4,415</td>
<td>10.5</td>
<td>19.36</td>
<td>9.39</td>
<td>732.06</td>
</tr>
<tr>
<td>Ariopsis felis</td>
<td>4,321</td>
<td>10.2</td>
<td>18.95</td>
<td>4.23</td>
<td>337.26</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>3,984</td>
<td>9.4</td>
<td>17.47</td>
<td>4.53</td>
<td>391.29</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>2,452</td>
<td>5.8</td>
<td>10.75</td>
<td>2.19</td>
<td>307.43</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>2,383</td>
<td>5.7</td>
<td>25.9</td>
<td>3.00</td>
<td>433.22</td>
</tr>
<tr>
<td>Eucinostomus gula</td>
<td>1,125</td>
<td>2.7</td>
<td>4.93</td>
<td>1.25</td>
<td>383.75</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>1,034</td>
<td>2.5</td>
<td>4.54</td>
<td>1.65</td>
<td>548.76</td>
</tr>
<tr>
<td>Dasyatis sabina</td>
<td>974</td>
<td>2.3</td>
<td>4.27</td>
<td>0.55</td>
<td>195.73</td>
</tr>
<tr>
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<td>.</td>
</tr>
<tr>
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<td>185.04</td>
<td>18.17</td>
<td>148.27</td>
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</table>

IR-11
<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>5,227</td>
<td>12.4</td>
<td>79.8</td>
<td>22.93</td>
<td>7.13</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>2,452</td>
<td>5.8</td>
<td>70.6</td>
<td>10.75</td>
<td>2.19</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>1,034</td>
<td>2.5</td>
<td>28.5</td>
<td>4.54</td>
<td>1.65</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>558</td>
<td>1.3</td>
<td>37.3</td>
<td>2.45</td>
<td>0.43</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>419</td>
<td>1.0</td>
<td>25.4</td>
<td>1.84</td>
<td>0.31</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>371</td>
<td>0.9</td>
<td>39.9</td>
<td>1.63</td>
<td>0.26</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>244</td>
<td>0.6</td>
<td>22.4</td>
<td>1.07</td>
<td>0.24</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>240</td>
<td>0.6</td>
<td>36.0</td>
<td>1.05</td>
<td>0.17</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>221</td>
<td>0.5</td>
<td>19.3</td>
<td>0.97</td>
<td>0.36</td>
</tr>
<tr>
<td>Trachinotus falcatus</td>
<td>121</td>
<td>0.3</td>
<td>4.8</td>
<td>0.53</td>
<td>0.43</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>99</td>
<td>0.2</td>
<td>18.0</td>
<td>0.43</td>
<td>0.09</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>99</td>
<td>0.2</td>
<td>11.8</td>
<td>0.43</td>
<td>0.12</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>77</td>
<td>0.2</td>
<td>5.3</td>
<td>0.34</td>
<td>0.18</td>
</tr>
<tr>
<td>Mugil rubrioculus</td>
<td>51</td>
<td>0.1</td>
<td>13.2</td>
<td>0.22</td>
<td>0.06</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>31</td>
<td>0.1</td>
<td>5.3</td>
<td>0.14</td>
<td>0.06</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>24</td>
<td>0.1</td>
<td>4.8</td>
<td>0.11</td>
<td>0.03</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>20</td>
<td>0.1</td>
<td>3.9</td>
<td>0.09</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Table IR17-05. Catch statistics for Selected Taxa collected in 228 183-m haul seine samples during northern Indian River Lagoon stratified-random sampling, 2017. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.
<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td><em>Lutjanus analis</em></td>
<td>12</td>
<td>&lt;0.1</td>
<td>2.6</td>
<td>0.05</td>
</tr>
<tr>
<td><em>Farfantepenaeus aztecs</em></td>
<td>11</td>
<td>&lt;0.1</td>
<td>2.2</td>
<td>0.05</td>
</tr>
<tr>
<td><em>Pomatomus saltatrix</em></td>
<td>10</td>
<td>&lt;0.1</td>
<td>2.2</td>
<td>0.04</td>
</tr>
<tr>
<td><em>Farfantepenaeus spp.</em></td>
<td>9</td>
<td>&lt;0.1</td>
<td>2.6</td>
<td>0.04</td>
</tr>
<tr>
<td><em>Cynoscion complex</em></td>
<td>8</td>
<td>&lt;0.1</td>
<td>2.2</td>
<td>0.04</td>
</tr>
<tr>
<td><em>Litopenaeus setiferus</em></td>
<td>8</td>
<td>&lt;0.1</td>
<td>1.3</td>
<td>0.04</td>
</tr>
<tr>
<td><em>Lutjanus synagris</em></td>
<td>6</td>
<td>&lt;0.1</td>
<td>1.8</td>
<td>0.03</td>
</tr>
<tr>
<td><em>Albula vulpes</em></td>
<td>5</td>
<td>&lt;0.1</td>
<td>1.3</td>
<td>0.02</td>
</tr>
<tr>
<td><em>Trachinotus carolinus</em></td>
<td>4</td>
<td>&lt;0.1</td>
<td>0.9</td>
<td>0.02</td>
</tr>
<tr>
<td><em>Menippe spp.</em></td>
<td>3</td>
<td>&lt;0.1</td>
<td>1.3</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Megalops atlanticus</em></td>
<td>3</td>
<td>&lt;0.1</td>
<td>0.9</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Panulirus argus</em></td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.4</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>11,368</strong></td>
<td><strong>27.0</strong></td>
<td><strong>.</strong></td>
<td><strong>49.86</strong></td>
</tr>
</tbody>
</table>
Table IR17-06. Catch statistics for 10 dominant taxa collected in 96 6.1-m bay otter trawl samples during northern Indian River Lagoon stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>% Occur</td>
<td>Mean</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>3,442</td>
<td>25.7</td>
<td>20.8</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>2,052</td>
<td>15.3</td>
<td>62.5</td>
</tr>
<tr>
<td>Gobiosoma spp.</td>
<td>1,259</td>
<td>9.4</td>
<td>65.6</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>725</td>
<td>5.4</td>
<td>37.5</td>
</tr>
<tr>
<td>Gobiosoma robustum</td>
<td>656</td>
<td>4.9</td>
<td>51.0</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>679</td>
<td>5.1</td>
<td>77.1</td>
</tr>
<tr>
<td>Syngnathus scovelli</td>
<td>618</td>
<td>4.6</td>
<td>54.2</td>
</tr>
<tr>
<td>Callinectes ornatus</td>
<td>512</td>
<td>3.8</td>
<td>42.7</td>
</tr>
<tr>
<td>Diapterus auratus</td>
<td>387</td>
<td>2.9</td>
<td>24.0</td>
</tr>
<tr>
<td>Eucinostomus gula</td>
<td>352</td>
<td>2.6</td>
<td>38.5</td>
</tr>
</tbody>
</table>

Subtotals                  | 10,682 | 79.8    | .    | .      | .    | .     | .    | .      | 2   | 144 |

Totals                    | 13,380 | 100.0   | 27.04| 4.02   | 145.80| 238.20 | .    | .      | 2   | 559 |
Table IR17-07. Catch statistics for Selected Taxa collected in 96 6.1-m bay otter trawl samples during northern Indian River Lagoon stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number No.</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>679</td>
<td>5.1</td>
<td>77.1</td>
<td>1.45</td>
<td>0.28</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>252</td>
<td>1.9</td>
<td>19.8</td>
<td>0.52</td>
<td>0.18</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>199</td>
<td>1.5</td>
<td>61.5</td>
<td>0.41</td>
<td>0.06</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>124</td>
<td>0.9</td>
<td>13.5</td>
<td>0.25</td>
<td>0.12</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>109</td>
<td>0.8</td>
<td>22.9</td>
<td>0.23</td>
<td>0.07</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>104</td>
<td>0.8</td>
<td>12.5</td>
<td>0.20</td>
<td>0.10</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>47</td>
<td>0.4</td>
<td>14.6</td>
<td>0.10</td>
<td>0.03</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>35</td>
<td>0.3</td>
<td>11.5</td>
<td>0.07</td>
<td>0.04</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>30</td>
<td>0.2</td>
<td>14.6</td>
<td>0.06</td>
<td>0.02</td>
</tr>
<tr>
<td>Cynoscion complex</td>
<td>25</td>
<td>0.2</td>
<td>11.5</td>
<td>0.05</td>
<td>0.02</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>23</td>
<td>0.2</td>
<td>12.5</td>
<td>0.05</td>
<td>0.01</td>
</tr>
<tr>
<td>Farfantepenaeus aztecus</td>
<td>17</td>
<td>0.1</td>
<td>11.5</td>
<td>0.04</td>
<td>0.01</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>17</td>
<td>0.1</td>
<td>12.5</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>14</td>
<td>0.1</td>
<td>3.1</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Lutjanus analis</td>
<td>14</td>
<td>0.1</td>
<td>8.3</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Menippe spp.</td>
<td>9</td>
<td>0.1</td>
<td>6.3</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Albula vulpes</td>
<td>4</td>
<td>&lt;0.1</td>
<td>4.2</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Species</td>
<td>Number</td>
<td>% Occur</td>
<td>Catch-per-unit-effort (animals/set)</td>
<td>Standard Length (mm)</td>
<td></td>
</tr>
<tr>
<td>-------------------</td>
<td>--------</td>
<td>---------</td>
<td>------------------------------------</td>
<td>----------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Leioptomus xanthurus</td>
<td>3</td>
<td>&lt;0.1</td>
<td>3.1</td>
<td>0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>3</td>
<td>&lt;0.1</td>
<td>3.1</td>
<td>0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Panulirus argus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>1.0</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Lutjanus apodus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>1.0</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>1,710</td>
<td>12.8</td>
<td>.</td>
<td>3.56</td>
<td>0.50</td>
</tr>
</tbody>
</table>
Table IR17-08. Catch statistics for 10 dominant taxa collected in 120 21.3-m river seine samples during northern Indian River Lagoon stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m(^2))</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>37,536</td>
<td>59.9</td>
<td>40.0</td>
<td>460.00</td>
<td>203.07</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>9,667</td>
<td>15.4</td>
<td>75.8</td>
<td>118.47</td>
<td>30.38</td>
</tr>
<tr>
<td>Diapterus auratus</td>
<td>2,827</td>
<td>4.5</td>
<td>70.0</td>
<td>34.64</td>
<td>6.54</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>2,148</td>
<td>3.4</td>
<td>63.3</td>
<td>26.32</td>
<td>5.89</td>
</tr>
<tr>
<td>Eugerres plumieri</td>
<td>1,797</td>
<td>2.9</td>
<td>56.7</td>
<td>22.02</td>
<td>6.24</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>1,614</td>
<td>2.6</td>
<td>10.8</td>
<td>19.78</td>
<td>18.07</td>
</tr>
<tr>
<td>Brevoortia spp.</td>
<td>1,203</td>
<td>1.9</td>
<td>18.3</td>
<td>14.74</td>
<td>5.62</td>
</tr>
<tr>
<td>Gambusia holbrooki</td>
<td>631</td>
<td>1.0</td>
<td>38.3</td>
<td>7.73</td>
<td>2.08</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>618</td>
<td>1.0</td>
<td>20.0</td>
<td>7.57</td>
<td>6.21</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>531</td>
<td>0.9</td>
<td>54.2</td>
<td>6.51</td>
<td>1.18</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
<td><strong>58,572</strong></td>
<td><strong>93.4</strong></td>
<td><strong>.</strong></td>
<td><strong>.</strong></td>
<td><strong>.</strong></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>62,699</strong></td>
<td><strong>100.0</strong></td>
<td><strong>.</strong></td>
<td><strong>768.37</strong></td>
<td><strong>216.53</strong></td>
</tr>
</tbody>
</table>
Table IR17-09. Catch statistics for Selected Taxa collected in 120 21.3-m river seine samples during northern Indian River Lagoon stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>1,614</td>
<td>2.6</td>
<td>19.78</td>
<td>18.07</td>
<td>1,000.92</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>531</td>
<td>0.9</td>
<td>6.51</td>
<td>1.18</td>
<td>198.37</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>189</td>
<td>0.3</td>
<td>2.32</td>
<td>1.13</td>
<td>535.07</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>160</td>
<td>0.3</td>
<td>1.96</td>
<td>0.60</td>
<td>336.58</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>109</td>
<td>0.2</td>
<td>1.34</td>
<td>0.34</td>
<td>282.58</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>92</td>
<td>0.2</td>
<td>1.13</td>
<td>0.87</td>
<td>850.16</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>37</td>
<td>0.1</td>
<td>0.45</td>
<td>0.13</td>
<td>325.13</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>29</td>
<td>0.1</td>
<td>0.36</td>
<td>0.14</td>
<td>425.78</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>27</td>
<td>&lt;0.1</td>
<td>0.33</td>
<td>0.15</td>
<td>493.85</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>27</td>
<td>&lt;0.1</td>
<td>0.33</td>
<td>0.26</td>
<td>857.45</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>27</td>
<td>&lt;0.1</td>
<td>0.33</td>
<td>0.08</td>
<td>279.09</td>
</tr>
<tr>
<td>Mugil rubrioculus</td>
<td>19</td>
<td>&lt;0.1</td>
<td>0.23</td>
<td>0.20</td>
<td>929.94</td>
</tr>
<tr>
<td>Albula vulpes</td>
<td>10</td>
<td>&lt;0.1</td>
<td>0.12</td>
<td>0.10</td>
<td>888.02</td>
</tr>
<tr>
<td>Trachinotus falcatus</td>
<td>8</td>
<td>&lt;0.1</td>
<td>0.10</td>
<td>0.10</td>
<td>1,095.45</td>
</tr>
<tr>
<td>Farfantepenaeus aztecus</td>
<td>6</td>
<td>&lt;0.1</td>
<td>0.07</td>
<td>0.03</td>
<td>508.75</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>3</td>
<td>&lt;0.1</td>
<td>0.04</td>
<td>0.04</td>
<td>1,095.45</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>2</td>
<td>&lt;0.1</td>
<td>0.02</td>
<td>0.02</td>
<td>771.34</td>
</tr>
<tr>
<td>Megalops atlanticus</td>
<td>2</td>
<td>&lt;0.1</td>
<td>0.02</td>
<td>0.02</td>
<td>1,095.45</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.01</td>
<td>0.01</td>
<td>1,095.45</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>2,893</td>
<td>4.6</td>
<td>.</td>
<td>35.45</td>
<td>18.25</td>
</tr>
</tbody>
</table>
Appendix IR17-01. Monthly summary of species collected during northern Indian River Lagoon stratified-random sampling, 2017. Effort, or total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

<table>
<thead>
<tr>
<th>Species</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acanthostracion spp.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>2</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>2</td>
</tr>
<tr>
<td>Achirus lineatus</td>
<td>8</td>
<td>8</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>16</td>
<td>15</td>
<td>8</td>
<td>21</td>
<td>15</td>
<td>19</td>
<td>9</td>
<td>130</td>
</tr>
<tr>
<td>Agonostomus monticola</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>10</td>
<td>2</td>
<td>13</td>
<td>25</td>
</tr>
<tr>
<td>Albula vulpes</td>
<td>10</td>
<td>2</td>
<td>8</td>
<td>1</td>
<td>10</td>
<td>.</td>
<td>13</td>
<td>4</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Aluterus schoepfii</td>
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<td>.</td>
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<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>2</td>
</tr>
<tr>
<td>Anchoa cubana</td>
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<td>.</td>
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<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>49</td>
<td>.</td>
<td>.</td>
<td>51</td>
</tr>
<tr>
<td>Anchoa hepsetus</td>
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<td>.</td>
<td>77</td>
<td>133</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>235</td>
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<tr>
<td>Anchoa lamprotaenia</td>
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<td>.</td>
<td>1</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>3</td>
</tr>
<tr>
<td>Anchoa lyolepis</td>
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<td>.</td>
<td>.</td>
<td>5</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>951</td>
<td>15</td>
<td>.</td>
<td>971</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>10,009</td>
<td>4,776</td>
<td>5,395</td>
<td>33,894</td>
<td>27,704</td>
<td>7,629</td>
<td>11,378</td>
<td>66,075</td>
<td>8,095</td>
<td>24,846</td>
<td>9,161</td>
<td>10,358</td>
<td>219,320</td>
</tr>
<tr>
<td>Anchoa spp.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>9</td>
<td>1</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>7</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>17</td>
</tr>
<tr>
<td>Anguilla rostrata</td>
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<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>1</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>15</td>
<td>31</td>
<td>35</td>
<td>59</td>
<td>90</td>
<td>60</td>
<td>59</td>
<td>38</td>
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Summary by gear and stratum of species collected during northern Indian River Lagoon stratified-random sampling, 2017. 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 post-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.

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Appendix IR17-03. Summary by zone of species collected during northern Indian River Lagoon stratified-random sampling, 2017. Zones A–C and H were located in the Indian River; Zones D–E encompassed the Banana River; and Zone F encompassed the lower Sebastian River and Turkey Creek. Effort, or the total number of hauls, is labeled ‘E’. Taxa are arranged alphabetically.

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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 CK17-01). Monthly stratified-random sampling (SRS) was conducted in Zones B and C using 21.3-m bay seines, 183-m haul seines, and 6.1-m bay otter trawls. Tidal creeks in Zone B were sampled using 21.3-m river seines. Monthly SRS was conducted in Zone F with 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2017 in the Cedar Key area.

Stratified-Random Sampling

A total of 92,546 animals, which included 143 taxa of fishes and 9 taxa of selected invertebrates, were collected from 792 Cedar Key SRS samples in 2017 (Table CK17-01; Appendices CK17-01 and -02). Anchoa mitchilli (n=33,185) and Bairdiella chrysoura (n=10,492) were the most numerous taxa collected, representing 47.2% of the total catch. Lagodon rhomboides (n=6,983), Eucinostomus spp. (n=5,642), and Menidia spp. (n=3,175) were the next most abundant taxa collected, accounting for an additional 17.1% of the total catch. Twenty-five Selected Taxa (n=12,496 animals) composed 13.5% of the total catch. Mugil cephalus (n=2,865), Leiostomus xanthurus (n=2,342), Callinectes sapidus (n=1,369), and Menticirrhus americanus (n=1,003) were the most abundant Selected Taxa, representing 8.2% of the annual catch. Collections in 2017 included two species new to the Cedar Key FIM collection: Argopecten gibbus (Atlantic Calico Scallop) and Ctenogobius smaragdus (Emerald Goby).
Bay Sampling

**21.3-m Bay Seine.** A total of 40,485 animals were collected in 252 21.3-m bay seines, representing 43.7% of the overall SRS catch (Table CK17-01). *Anchoa mitchilli* (n=23,818), *Eucinostomus* spp. (n=3,215), *Lagodon rhomboïdes* (n=1,725), and *Membras martinica* (n=1,529) were the most abundant taxa, accounting for 74.8% of the 21.3-m bay seine catch (Table CK17-02). The taxa most frequently caught in 21.3-m bay seines were *Anchoa mitchilli* (44.8% occurrence), *Lagodon rhomboïdes* (36.5% occurrence), and *Eucinostomus* spp. (31.7% occurrence).

A total of 4,062 animals from 21 Selected Taxa were collected, representing 10.0% of the entire 21.3-m bay seine catch (Table CK17-03). *Leiostomus xanthurus* (n=1,406), *Farfantepenaeus* spp. (n=619), and *Mugil cephalus* (n=514) were the most abundant Selected Taxa, accounting for 62.5% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m bay seines were *Callinectes sapidus* (29.4% occurrence) and *Menticirrhus americanus* (19.0% occurrence).

**183-m Haul Seine.** A total of 23,271 animals were collected in 192 183-m haul seines, representing 25.1% of the overall SRS catch (Table CK17-01). *Bairdiella chrysoura* (n=8,202), *Lagodon rhomboïdes* (n=4,352), and *Mugil cephalus* (n=2,300) were the most abundant taxa, accounting for 63.8% of the 183-m haul seine catch (Table CK17-04). The taxa most frequently caught in 183-m haul seines were *Dasyatis sabina* (80.7% occurrence), *Mugil cephalus* (77.6% occurrence), and *Lagodon rhomboïdes* (72.9% occurrence).

A total of 5,174 animals from 24 Selected Taxa were collected, representing 22.2% of the entire 183-m haul seine catch (Table CK17-05). *Mugil cephalus* (n=2,300) was the most abundant Selected Taxon, accounting for 44.5% of the Selected Taxa collected by this gear. The Selected Taxon most frequently caught in 183-m haul seines was *Mugil cephalus* (77.6% occurrence).

**6.1-m Bay Otter Trawl.** A total of 10,448 animals were collected in 120 6.1-m bay otter trawls, representing 11.3% of the overall SRS catch (Table CK17-01). *Anchoa mitchilli* (n=2,708) was the most abundant taxon, accounting for 25.9% of the 6.1-m bay otter trawl catch (Table CK17-06). The taxa most frequently caught in 6.1-m bay otter
trawls were *Prionotus scitulus* (62.5% occurrence), *Etropus crossoptus* (60.8% occurrence), *Portunus* spp. (44.2% occurrence), and *Orthopristis chrysoptera* (35.8%).

A total of 1,440 animals from 12 Selected Taxa were collected, representing 13.8% of the entire 6.1-m bay otter trawl catch (Table CK17-07). *Menticirrhus americanus* (n=572) and *Cynoscion arenarius* (n=292) were the most abundant Selected Taxa, accounting for 60.0% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 6.1-m bay otter trawls were *Menippe* spp. (37.5% occurrence) and *Farfantepenaeus duorarum* (29.2% occurrence).

**River Sampling**

**Tidal Creeks**

*21.3-m River Seines.* A total of 10,295 animals were collected in 108 21.3-m river seines conducted in tidal creeks, representing 11.1% of the overall SRS catch (Table CK17-01). *Anchoa mitchilli* (n=4,859) and *Menidia* spp. (n=1,416) were the most abundant taxa collected, accounting for 61.0% of the total 21.3-m river seine catch in tidal creeks (Table CK17-08). The taxa most frequently caught in 21.3-m river seines conducted in tidal creeks were *Menidia* spp. (72.2% occurrence), *Anchoa mitchilli* (57.4% occurrence), and *Eucinostomus* spp. (50.0% occurrence).

A total of 852 animals from 18 Selected Taxa were collected, representing 8.3% of the entire 21.3-m river seine catch in tidal creeks (Table CK17-09). *Leiostomus xanthurus* (n=394) and *Callinectes sapidus* (n=192) were the most abundant Selected Taxa, accounting for 68.8% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m river seines conducted in tidal creeks were *Callinectes sapidus* (42.6% occurrence) and *Leiostomus xanthurus* (27.8% occurrence).

**Lower Suwannee River**

*21.3-m River Seines.* A total of 4,272 animals were collected in 60 21.3-m river seine samples conducted in the Lower Suwannee River (LSR), representing 4.6% of the overall SRS catch (Table CK17-01). *Membras martinica* (n=851), *Anchoa mitchilli*
(n=647), and *Menidia* spp. (n=634) were the most abundant taxa collected, accounting for 49.9% of the total 21.3-m river seine catch in the LSR (Table CK17-10). The taxa most frequently caught in 21.3-m river seines conducted in the LSR were *Callinectes sapidus* (53.3% occurrence), *Menidia* spp. (50.0% occurrence), and *Eucinostomus* spp. (50.0% occurrence).

A total of 356 animals from 13 Selected Taxa were collected, representing 8.3% of the entire 21.3-m river seine catch in the LSR (Table CK17-11). *Callinectes sapidus* (n=213) was the most abundant Selected Taxon, accounting for 59.8% of the Selected Taxa collected by this gear. The Selected Taxon most frequently caught in 21.3-m river seines conducted in the LSR was *Callinectes sapidus* (53.3% occurrence).

6.1-m River Otter Trawl. A total of 3,775 animals were collected in 60 6.1-m river otter trawl samples conducted in the LSR, representing 4.1% of the overall SRS catch (Table CK17-01). *Anchoa mitchilli* (n=1,153) and *Eucinostomus* spp. (n=1,074) were the most abundant taxa collected, accounting for 59.0% of the 6.1-m river otter trawl catch (Table CK17-12). The taxon most frequently caught in 6.1-m river otter trawls conducted in the LSR were *Callinectes sapidus* (70.0% occurrence).

A total of 612 animals from 13 Selected Taxa were collected, representing 16.2% of the entire 6.1-m river otter trawl catch in the LSR (Table CK17-13). *Callinectes sapidus* (n=280) and *Cynoscion arenarius* (n=112) were the most abundant Selected Taxa, accounting for 64.1% of the Selected Taxa captured by this gear. The Selected Taxa most frequently caught in 6.1-m river otter trawls conducted in the LSR were *Callinectes sapidus* (70.0% occurrence) and *Cynoscion arenarius* (28.3% occurrence).
References


Figure CK17-01. Map of Cedar Key sampling area. Zones are labeled B, C, and F. Grids containing portions of Zones B and F are labeled B/F.
Table CK17-01.  Summary of catch and effort data for Cedar Key stratified-random sampling, 2017.

| 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    | 23,694 | 120 | 10,295 | 108 | 13,276 | 96 | 5,716 | 60 | 52,981 | 384 |
| C    | 16,791 | 132 | . | . | 9,995 | 96 | 4,732 | 60 | 31,518 | 288 |
| F    | . | . | 4,272 | 60 | . | . | 3,775 | 60 | 8,047 | 120 |
| Totals | 40,485 | 252 | 14,567 | 168 | 23,271 | 192 | 14,223 | 180 | 92,546 | 792 |
Table CK17-02. Catch statistics for 10 dominant taxa collected in 252 21.3-m bay seine samples during Cedar Key stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>23,818</td>
<td>58.8</td>
<td>44.8</td>
<td>67.51</td>
<td>27.13</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>3,215</td>
<td>7.9</td>
<td>31.7</td>
<td>9.11</td>
<td>2.91</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>1,725</td>
<td>4.3</td>
<td>36.5</td>
<td>4.89</td>
<td>2.17</td>
</tr>
<tr>
<td>Membras martinica</td>
<td>1,529</td>
<td>3.8</td>
<td>18.7</td>
<td>4.33</td>
<td>1.41</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>1,406</td>
<td>3.5</td>
<td>13.1</td>
<td>3.99</td>
<td>3.06</td>
</tr>
<tr>
<td>Menidia spp.</td>
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<td>2.8</td>
<td>27.8</td>
<td>3.19</td>
<td>0.88</td>
</tr>
<tr>
<td>Anchoa hepsetus</td>
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<td>1.9</td>
<td>18.3</td>
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<td>0.65</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
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<td>1.5</td>
<td>16.7</td>
<td>1.75</td>
<td>0.92</td>
</tr>
<tr>
<td>Bairdiella chrysoura</td>
<td>570</td>
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<td>13.5</td>
<td>1.62</td>
<td>0.70</td>
</tr>
<tr>
<td>Mugil cephalus</td>
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<td>10.7</td>
<td>1.46</td>
<td>1.18</td>
</tr>
<tr>
<td>Subtotals</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
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<td>100.0</td>
<td>114.75</td>
<td>28.94</td>
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Table CK17-03. Catch statistics for Selected Taxa collected in 252 21.3-m bay seine samples during Cedar Key stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>1,406</td>
<td>3.5</td>
<td>13.1</td>
<td>3.99</td>
<td>3.06</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>619</td>
<td>1.5</td>
<td>16.7</td>
<td>1.75</td>
<td>0.92</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>514</td>
<td>1.3</td>
<td>10.7</td>
<td>1.46</td>
<td>1.18</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>370</td>
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<td>29.4</td>
<td>1.05</td>
<td>0.27</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>365</td>
<td>0.9</td>
<td>19.0</td>
<td>1.03</td>
<td>0.25</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
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<td>8.7</td>
<td>0.69</td>
<td>0.31</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>178</td>
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<td>0.50</td>
<td>0.24</td>
</tr>
<tr>
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<td>5.6</td>
<td>0.39</td>
<td>0.17</td>
</tr>
<tr>
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<td>11.1</td>
<td>0.13</td>
<td>0.03</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>42</td>
<td>0.1</td>
<td>7.9</td>
<td>0.12</td>
<td>0.04</td>
</tr>
<tr>
<td>Trachinotus falcatus</td>
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<td>3.2</td>
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<td>0.06</td>
</tr>
<tr>
<td>Menticirrhus Saxatilis</td>
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<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
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<td>0.1</td>
<td>2.8</td>
<td>0.06</td>
<td>0.04</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>13</td>
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<td>0.04</td>
<td>0.02</td>
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<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
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<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
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<td>&lt;0.1</td>
<td>2.4</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Species</td>
<td>Number</td>
<td>%</td>
<td>% Occur</td>
<td>Density Estimate (animals/100m²)</td>
<td>Standard Length (mm)</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------</td>
<td>---</td>
<td>---------</td>
<td>-------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td><em>Pogonias cromis</em></td>
<td>8</td>
<td>&lt;0.1</td>
<td>3.2</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Menippe spp.</em></td>
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<td>&lt;0.1</td>
<td>1.2</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Elops saurus</em></td>
<td>4</td>
<td>&lt;0.1</td>
<td>1.6</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Archosargus probatocephalus</em></td>
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<td>1.6</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Centropomus undecimalis</em></td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.4</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
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<td>.</td>
<td>11.51</td>
<td>3.52</td>
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</tbody>
</table>
### Table CK17-04

Catch statistics for 10 dominant taxa collected in 192 183-m haul seine samples during Cedar Key stratified-random sampling, 2017. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
<td>Max</td>
</tr>
<tr>
<td>Bairdiella chrysoura</td>
<td>8,202</td>
<td>35.3</td>
<td>37.5</td>
<td>42.72</td>
<td>28.64</td>
<td>929.06</td>
<td>5,463.00</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>4,352</td>
<td>18.7</td>
<td>72.9</td>
<td>22.67</td>
<td>3.86</td>
<td>235.93</td>
<td>382.00</td>
</tr>
<tr>
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<td>2,300</td>
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<td>77.6</td>
<td>11.98</td>
<td>1.95</td>
<td>225.45</td>
<td>175.00</td>
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<td>80.7</td>
<td>8.07</td>
<td>1.05</td>
<td>180.00</td>
<td>118.00</td>
</tr>
<tr>
<td>Ariopsis felis</td>
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<td>3.6</td>
<td>49.5</td>
<td>4.32</td>
<td>0.68</td>
<td>218.32</td>
<td>77.00</td>
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<tr>
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<td>31.8</td>
<td>3.03</td>
<td>1.17</td>
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<td>205.00</td>
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<td>2.92</td>
<td>0.69</td>
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<tr>
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<td>42.2</td>
<td>2.44</td>
<td>0.74</td>
<td>421.89</td>
<td>131.00</td>
</tr>
<tr>
<td>Harengula jaguana</td>
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<td>1.8</td>
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<td>2.18</td>
<td>0.82</td>
<td>520.72</td>
<td>142.00</td>
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<tr>
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<td>1.7</td>
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<td>0.51</td>
<td>332.56</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
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<td></td>
<td>121.20</td>
<td>29.58</td>
<td>338.21</td>
<td>5,599.00</td>
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</table>

CK-11
Table CK17-05. Catch statistics for Selected Taxa collected in 192 183-m haul seine samples during Cedar Key stratified-random sampling, 2017. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>2,300</td>
<td>9.9</td>
<td>77.6</td>
<td>11.98</td>
<td>1.95</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>582</td>
<td>2.5</td>
<td>31.8</td>
<td>3.03</td>
<td>1.17</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>469</td>
<td>2.0</td>
<td>42.2</td>
<td>2.44</td>
<td>0.74</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>406</td>
<td>1.7</td>
<td>24.0</td>
<td>2.11</td>
<td>0.51</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
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<td>33.9</td>
<td>1.06</td>
<td>0.21</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>199</td>
<td>0.9</td>
<td>40.1</td>
<td>1.04</td>
<td>0.18</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>179</td>
<td>0.8</td>
<td>37.5</td>
<td>0.93</td>
<td>0.13</td>
</tr>
<tr>
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<td>0.19</td>
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<tr>
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<tr>
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<tr>
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<td>26.6</td>
<td>0.55</td>
<td>0.09</td>
</tr>
<tr>
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<td>13.5</td>
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</tr>
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<td>0.2</td>
<td>10.4</td>
<td>0.23</td>
<td>0.09</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
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<td>0.08</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
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<td>10.4</td>
<td>0.19</td>
<td>0.05</td>
</tr>
<tr>
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<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Species</td>
<td>Number</td>
<td>% Occur</td>
<td>Density Estimate (animals/100m²)</td>
<td>Standard Length (mm)</td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------</td>
<td>---------</td>
<td>----------------------------------</td>
<td>----------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
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<td>0.03</td>
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<td>0.03</td>
<td>728.26</td>
</tr>
<tr>
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<td>&lt;0.1</td>
<td>2.1</td>
<td>0.03</td>
<td>728.26</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
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<td>844.82</td>
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<tr>
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<td>1.0</td>
<td>0.01</td>
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</tr>
<tr>
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<td>2</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>0.01</td>
<td>1,385.64</td>
</tr>
<tr>
<td>Farfantepenaeus sp.</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>0.01</td>
<td>1,385.64</td>
</tr>
<tr>
<td>Mycteroperca microlepis</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>0.01</td>
<td>1,385.64</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>5,174</td>
<td>22.2</td>
<td></td>
<td>26.95</td>
<td>2.70</td>
</tr>
</tbody>
</table>

Table CK17-05. (Continued).
Table CK17-06. Catch statistics for 10 dominant taxa collected in 120 6.1-m bay otter trawl samples during Cedar Key stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>2,708</td>
<td>25.9</td>
<td>13.3</td>
<td>1.56</td>
<td>0.89</td>
</tr>
<tr>
<td>Bairdiella chrysoura</td>
<td>928</td>
<td>8.9</td>
<td>28.3</td>
<td>0.52</td>
<td>0.16</td>
</tr>
<tr>
<td>Ariopsis felis</td>
<td>897</td>
<td>8.6</td>
<td>17.5</td>
<td>0.44</td>
<td>0.26</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>572</td>
<td>5.5</td>
<td>22.5</td>
<td>0.33</td>
<td>0.17</td>
</tr>
<tr>
<td>Portunus spp.</td>
<td>488</td>
<td>4.7</td>
<td>44.2</td>
<td>0.28</td>
<td>0.11</td>
</tr>
<tr>
<td>Etropus crossotus</td>
<td>475</td>
<td>4.6</td>
<td>60.8</td>
<td>0.28</td>
<td>0.04</td>
</tr>
<tr>
<td>Prionotus scitulus</td>
<td>408</td>
<td>3.9</td>
<td>62.5</td>
<td>0.24</td>
<td>0.03</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>379</td>
<td>3.6</td>
<td>35.0</td>
<td>0.24</td>
<td>0.06</td>
</tr>
<tr>
<td>Orthopristis chrysoptera</td>
<td>340</td>
<td>3.3</td>
<td>35.8</td>
<td>0.22</td>
<td>0.08</td>
</tr>
<tr>
<td>Chloroscombrus chrysurus</td>
<td>304</td>
<td>2.9</td>
<td>10.8</td>
<td>0.18</td>
<td>0.10</td>
</tr>
<tr>
<td>Subtotals</td>
<td>7,499</td>
<td>71.8</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>10,448</td>
<td>100.0</td>
<td>6.04</td>
<td>1.44</td>
<td>261.33</td>
</tr>
</tbody>
</table>
Table CK17-07. Catch statistics for Selected Taxa collected in 120 6.1-m bay otter trawl samples during Cedar Key stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>% Occur</td>
<td>Mean</td>
</tr>
<tr>
<td>Menticirrhhus americanus</td>
<td>572</td>
<td>5.5</td>
<td>0.33</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>292</td>
<td>2.8</td>
<td>0.16</td>
</tr>
<tr>
<td>Menippe spp.</td>
<td>122</td>
<td>1.2</td>
<td>0.07</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>111</td>
<td>1.1</td>
<td>0.07</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>107</td>
<td>1.0</td>
<td>0.06</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>81</td>
<td>0.8</td>
<td>0.05</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>48</td>
<td>0.5</td>
<td>0.03</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>44</td>
<td>0.4</td>
<td>0.03</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>32</td>
<td>0.3</td>
<td>0.02</td>
</tr>
<tr>
<td>Leioseomus xanthurus</td>
<td>21</td>
<td>0.2</td>
<td>0.01</td>
</tr>
<tr>
<td>Menticirrhhus saxatilis</td>
<td>7</td>
<td>0.1</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>2</td>
<td>&lt;0.1</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>1,440</strong></td>
<td><strong>13.8</strong></td>
<td><strong>.</strong></td>
</tr>
</tbody>
</table>
Table CK17-08. Catch statistics for 10 dominant taxa collected in 108 21.3-m river seine samples conducted in tidal creeks during Cedar Key stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>4,859</td>
<td>47.2</td>
<td>57.4</td>
<td>66.16</td>
<td>29.05</td>
</tr>
<tr>
<td>Menidia spp.</td>
<td>1,416</td>
<td>13.8</td>
<td>72.2</td>
<td>19.28</td>
<td>4.47</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>813</td>
<td>7.9</td>
<td>50.0</td>
<td>11.07</td>
<td>3.13</td>
</tr>
<tr>
<td>Bairdiella chrysoura</td>
<td>429</td>
<td>4.2</td>
<td>21.3</td>
<td>5.84</td>
<td>4.30</td>
</tr>
<tr>
<td>Anchoa hepsetus</td>
<td>411</td>
<td>4.0</td>
<td>11.1</td>
<td>5.60</td>
<td>2.91</td>
</tr>
<tr>
<td>Leioctomus xanthurus</td>
<td>394</td>
<td>3.8</td>
<td>27.8</td>
<td>5.36</td>
<td>1.80</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>382</td>
<td>3.7</td>
<td>30.6</td>
<td>5.20</td>
<td>2.32</td>
</tr>
<tr>
<td>Fundulus similis</td>
<td>227</td>
<td>2.2</td>
<td>8.3</td>
<td>3.09</td>
<td>2.54</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>192</td>
<td>1.9</td>
<td>42.6</td>
<td>2.61</td>
<td>0.68</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>163</td>
<td>1.6</td>
<td>36.1</td>
<td>2.22</td>
<td>0.42</td>
</tr>
<tr>
<td>Subtotals</td>
<td>9,286</td>
<td>90.2</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>Totals</td>
<td>10,295</td>
<td>100.0</td>
<td>140.18</td>
<td>32.61</td>
<td>241.76</td>
</tr>
</tbody>
</table>
Table CK17-09. Catch statistics for Selected Taxa collected in 108 21.3-m river seine samples conducted in tidal creeks during Cedar Key stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------</td>
<td>---</td>
<td>---------</td>
<td>--------</td>
<td>----</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>394</td>
<td>3.8</td>
<td>27.8</td>
<td>5.36</td>
<td>1.80</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>192</td>
<td>1.9</td>
<td>42.6</td>
<td>2.61</td>
<td>0.68</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>68</td>
<td>0.7</td>
<td>15.7</td>
<td>0.93</td>
<td>0.56</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>47</td>
<td>0.5</td>
<td>12.0</td>
<td>0.64</td>
<td>0.28</td>
</tr>
<tr>
<td>Mugil trichodon</td>
<td>39</td>
<td>0.4</td>
<td>3.7</td>
<td>0.53</td>
<td>0.46</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>23</td>
<td>0.2</td>
<td>9.3</td>
<td>0.31</td>
<td>0.12</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>17</td>
<td>0.2</td>
<td>10.2</td>
<td>0.23</td>
<td>0.08</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>16</td>
<td>0.2</td>
<td>3.7</td>
<td>0.22</td>
<td>0.16</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>15</td>
<td>0.2</td>
<td>8.3</td>
<td>0.20</td>
<td>0.08</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>14</td>
<td>0.1</td>
<td>9.3</td>
<td>0.19</td>
<td>0.06</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>8</td>
<td>0.1</td>
<td>2.8</td>
<td>0.11</td>
<td>0.08</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>6</td>
<td>0.1</td>
<td>5.6</td>
<td>0.08</td>
<td>0.03</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>3</td>
<td>&lt;0.1</td>
<td>1.9</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>3</td>
<td>&lt;0.1</td>
<td>1.9</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Trachinotus falcatus</td>
<td>2</td>
<td>&lt;0.1</td>
<td>1.9</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>2</td>
<td>&lt;0.1</td>
<td>1.9</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.9</td>
<td>0.01</td>
<td>0.01</td>
</tr>
</tbody>
</table>
Table CK17-09. (Continued).

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>% Occur</td>
<td>Mean</td>
</tr>
<tr>
<td>Menticirrhus saxatilis</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.9</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.9</td>
</tr>
<tr>
<td>Totals</td>
<td>852</td>
<td>8.3</td>
<td>.</td>
</tr>
</tbody>
</table>
Table CK17-10. Catch statistics for 10 dominant taxa collected in 60 21.3-m river seine samples conducted in the Lower Suwannee River (LSR) during Cedar Key stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th></th>
<th></th>
<th>Density Estimate (animals/100m²)</th>
<th></th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>% Occur</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Membras martinica</td>
<td>851</td>
<td>19.9</td>
<td>5.0</td>
<td>20.86</td>
<td>16.97</td>
<td>630.08</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>647</td>
<td>15.2</td>
<td>30.0</td>
<td>15.86</td>
<td>8.18</td>
<td>399.49</td>
</tr>
<tr>
<td>Menidia spp.</td>
<td>634</td>
<td>14.8</td>
<td>50.0</td>
<td>15.54</td>
<td>6.50</td>
<td>323.77</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>518</td>
<td>12.1</td>
<td>50.0</td>
<td>12.70</td>
<td>4.51</td>
<td>275.27</td>
</tr>
<tr>
<td>Bairdiella chrysoura</td>
<td>284</td>
<td>6.7</td>
<td>13.3</td>
<td>6.96</td>
<td>3.84</td>
<td>426.84</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>254</td>
<td>6.0</td>
<td>43.3</td>
<td>6.23</td>
<td>1.70</td>
<td>211.70</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>213</td>
<td>5.0</td>
<td>53.3</td>
<td>5.22</td>
<td>1.09</td>
<td>161.15</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>210</td>
<td>4.9</td>
<td>45.0</td>
<td>5.15</td>
<td>1.24</td>
<td>186.99</td>
</tr>
<tr>
<td>Fundulus seminolis</td>
<td>173</td>
<td>4.1</td>
<td>20.0</td>
<td>4.24</td>
<td>2.72</td>
<td>496.39</td>
</tr>
<tr>
<td>Notropis petersoni</td>
<td>89</td>
<td>2.1</td>
<td>6.7</td>
<td>2.18</td>
<td>1.86</td>
<td>659.08</td>
</tr>
<tr>
<td>Subtotals</td>
<td>3,873</td>
<td>90.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>4,272</td>
<td>100.0</td>
<td>104.71</td>
<td>22.80</td>
<td>168.64</td>
<td>1,061.76</td>
</tr>
</tbody>
</table>

CK-19
Table CK17-11. Catch statistics for Selected Taxa collected in 60 21.3-m river seine samples conducted in the Lower Suwannee River (LSR) during Cedar Key stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>213</td>
<td>5.0</td>
<td>53.3</td>
<td>5.22</td>
<td>1.09</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>43</td>
<td>1.0</td>
<td>11.7</td>
<td>1.05</td>
<td>0.54</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>34</td>
<td>0.8</td>
<td>5.0</td>
<td>0.83</td>
<td>0.66</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>21</td>
<td>0.5</td>
<td>10.0</td>
<td>0.51</td>
<td>0.24</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>18</td>
<td>0.4</td>
<td>5.0</td>
<td>0.44</td>
<td>0.28</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>12</td>
<td>0.3</td>
<td>10.0</td>
<td>0.29</td>
<td>0.16</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>4</td>
<td>0.1</td>
<td>5.0</td>
<td>0.10</td>
<td>0.06</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>4</td>
<td>0.1</td>
<td>1.7</td>
<td>0.10</td>
<td>0.10</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>2</td>
<td>0.1</td>
<td>3.3</td>
<td>0.05</td>
<td>0.03</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>2</td>
<td>0.1</td>
<td>3.3</td>
<td>0.05</td>
<td>0.03</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>1.7</td>
<td>0.02</td>
<td>0.03</td>
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<tr>
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Table CK17-12. Catch statistics for 10 dominant taxa collected in 60 6.1-m river otter trawl samples conducted in the Lower Suwannee River (LSR) during Cedar Key stratified-random sampling, 2017. 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>
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<th>Species</th>
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<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
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Table CK17-13. Catch statistics for Selected Taxa collected in 60 6.1-m river otter trawl samples conducted in the Lower Suwannee River (LSR) during Cedar Key stratified-random sampling, 2017. 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.

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Appendix CK17-02. Summary by gear, stratum, and zone of species collected during Cedar Key stratified-random sampling, 2017. Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline ('Shore' or offshore) within 5-m. Offshore sets were post-stratified by the presence or absence of bottom vegetation ('Veg' or 'Unveg'). Sampling with 21.3-m river seine, 183-m haul seine, and 6.1-m otter trawl were not stratified. Zone B encompassed the northern portion of the universe and included all tidal creeks; Zone C encompassed the southern portion of the universe; and Zone F encompassed the lower Suwannee River. Effort, or the total number of hauls, is labeled ‘E’. Taxa are arranged alphabetically.

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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 AP17-01). Freshwater inflow to Apalachicola Bay primarily comes from the Apalachicola River and to a lesser extent the Carrabelle River (Livingston 1983). Shoreline vegetation consists largely of marsh grasses and bottom substrates are typically characterized as sand or mud with oyster beds scattered throughout the bay (Ingle and Dawson 1953). Less than 7% of the substrate is covered by seagrass (Continental Shelf Associates, Inc. 1985).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in Apalachicola Bay since 1998. The area sampled was divided into two geographically-defined bay zones (A and B) and one riverine zone (C; Figure AP17-01). Monthly stratified-random sampling (SRS) was conducted in Zones A and B using 21.3-m bay seines, 183-m haul seines, and 6.1-m bay otter trawls. Monthly SRS was conducted in Zone C with 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2017 in Apalachicola Bay.

Stratified-Random Sampling

A total of 173,036 animals, which included 184 taxa of fishes and 16 taxa of selected invertebrates, were collected from 840 Apalachicola Bay SRS samples in 2017 (Table AP17-01; Appendices AP17-01 and -02). Anchoa mitchilli (n=64,487) and Lagodon rhomboides (n=19,962) were the most numerous taxa collected, representing 48.8% of the total catch. Micropogonias undulatus (n=5,865), Cynoscion arenarius (n=5,616), Menidia spp. (n=5,549), Orthopristis chrysoptera (n=5,179), and Litopenaeus setiferus (n=5,050) were the next most abundant taxa collected, accounting for an additional 15.8% of the total catch. Thirty-two Selected Taxa (n=35,619) composed 20.6% of the total catch. Micropogonias undulatus (n=5,865), C. arenarius (n=5,616), Litopenaeus setiferus (n=5,050), Leiostomus xanthurus (n=4,870), and Mugil curema (n=3,468) were the most abundant Selected Taxa,
representing 14.4% of the annual catch. Collections in 2017 included three species new to the Apalachicola Bay FIM collection: *Hemiramphus brasiliensis* (Ballyhoo Halfbeak), *Microdesmus longipinnis* (Pink Wormfish), and *Raja texana* (Roundel Skate).

**Bay Sampling**

**21.3-m Bay Seines.** A total of 47,185 animals were collected in 240 21.3-m bay seines, representing 27.3% of the overall SRS catch (Table AP17-01). *Lagodon rhomboides* (n=7,824), *Anchoa mitchilli* (n=4,782) and *Menidia* spp. (n=4,613) were the most abundant taxa, accounting for 36.5% of the 21.3-m bay seine catch (Table AP17-02). The taxa most frequently caught in 21.3-m bay seines were *L. rhomboides* (56.7% occurrence) and *Farfantepenaeus* spp. (51.7% occurrence).

A total of 14,170 animals from 26 Selected Taxa were collected, representing 30.0% of the entire 21.3-m bay seine catch (Table AP17-03). *Mugil curema* (n=2,901), *L. xanthurus* (n=2,486), and *Farfantepenaeus* spp. (n=2,428) were the most abundant Selected Taxa, accounting for 55.2% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m bay seines were *Farfantepenaeus* spp. (51.7% occurrence), *Callinectes sapidus* (33.8% occurrence), and *L. xanthurus* (26.3% occurrence).

**183-m Haul Seines.** A total of 26,713 animals were collected in 216 183-m haul seines, representing 15.4% of the overall SRS catch (Table AP17-01). *Lagodon rhomboides* (n=11,681), *Brevoortia* spp. (n=2,831), and *L. xanthurus* (n=2,022) were the most abundant taxa, accounting for 61.9% of the 183-m haul seine catch (Table AP17-04). The taxa most frequently caught in 183-m haul seines were *Farfantepenaeus* spp. (51.7% occurrence), *Callinectes sapidus* (33.8% occurrence), and *L. xanthurus* (26.3% occurrence).

A total of 6,973 animals from 28 Selected Taxa were collected, representing 26.1% of the entire 183-m haul seine catch (Table AP17-05). *Leiostomus xanthurus* (n=2,022), *Mugil cephalus*, (n=1,318), and *Micropogonias undulatus* (n=968) were the most abundant Selected Taxa, accounting for 61.8% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 183-m haul seines were *M. cephalus* (73.6% occurrence), *L. xanthurus* (52.8% occurrence), and *Sciaenops ocellatus* (46.8% occurrence).

**6.1-m Bay Otter Trawls.** A total of 35,363 animals were collected in 144 6.1-m bay otter trawls, representing 20.4% of the overall SRS catch (Table AP17-01). *Anchoa mitchilli*
(n=13,496) and A. hepsetus (n=3,777) were the most abundant taxa collected, accounting for 48.8% of the 6.1-m bay otter trawl catch (Table AP17-06). The taxa most frequently caught in 6.1-m bay otter trawls were Etropus cossotus (85.4% occurrence) and M. undulatus (53.5% occurrence).

A total of 9,029 animals from 17 Selected Taxa were collected, representing 25.5% of the entire 6.1-m bay otter trawl catch (Table AP17-07). Cynoscion arenarius (n=2,602), L. setiferus (n=2,076), and M. undulatus (n=2,031) were the most abundant Selected Taxa, accounting for 74.3% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 6.1-m bay otter trawls were M. undulatus (53.5% occurrence) and Farfantepenaeus duorarum (42.4% occurrence).

**River Sampling**

21.3-m River Seines. A total of 13,921 animals were collected in 156 21.3-m river seines, representing 8.0% of the overall SRS catch (Table AP17-01). Anchoa mitchilli (n=3,308), Notropis petersoni (n=2,181), and Trinectes maculatus (n=1,068) were the most abundant taxa collected, accounting for 47.1% of the 21.3-m river seine catch (Table AP17-08). The taxa most frequently caught in 21.3-m river seines were T. maculatus (60.9% occurrence) and Lepomis punctatus (41.0% occurrence).

A total of 695 animals from 14 Selected Taxa were collected, representing 5.0% of the entire 21.3-m river seine catch (Table AP17-09). Callinectes sapidus (n=346) and M. cephalus (n=114) were the most abundant Selected Taxa, accounting for 66.2% of the Selected Taxa collected by this gear. The Selected Taxon most frequently caught in 21.3-m river seines was C. sapidus (48.7% occurrence).

6.1-m River Otter Trawls. A total of 49,854 animals were collected in 84 6.1-m river otter trawls, representing 28.8% of the overall SRS catch (Table AP17-01). Anchoa mitchilli (n=42,897) was the most abundant taxon collected, accounting for 86.1% of the 6.1-m river otter trawl catch (Table AP17-10). The taxa most frequently caught in 6.1-m river otter trawls were A. mitchilli (57.1% occurrence), C. sapidus (56.0% occurrence), and T. maculatus (54.8% occurrence).

A total of 4,753 animals from 14 Selected Taxa were collected, representing 9.5% of the entire 6.1-m river otter trawl catch (Table AP17-11). Cynoscion arenarius (n=2,138) and L. setiferus (n=922) were the most abundant Selected Taxa, accounting for 64.4% of the
Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 6.1-m river otter trawls were *Callinectes sapidus* (56.0% occurrence) and *Cynoscion arenarius* (32.1% occurrence).
References


Figure AP17-01. Map of Apalachicola Bay sampling area. Zones are labeled A–C. Grids containing portions of Zones A and C are labeled A/C.
Table AP17-01. Summary of catch and effort data for Apalachicola Bay stratified-random sampling, 2017.

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<th>21.3-m river seine</th>
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<td>Animals</td>
<td>Hauls</td>
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Catch statistics for 10 dominant taxa collected in 240 21.3-m bay seine samples during Apalachicola Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
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<td></td>
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<td>Mean</td>
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<td>CV</td>
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AP-8
Table AP17-03. Catch statistics for Selected Taxa collected in 240 21.3-m bay seine samples during Apalachicola Bay stratified-random sampling, 2017. 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>
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<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
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<td>Stderr</td>
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<td>7.30</td>
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<td>Farfantepenaeus aztecs</td>
<td>35</td>
<td>0.1</td>
<td>0.10</td>
<td>0.07</td>
</tr>
<tr>
<td>Menticirrhus saxatilis</td>
<td>33</td>
<td>0.1</td>
<td>0.10</td>
<td>0.04</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>18</td>
<td>0.1</td>
<td>0.29</td>
<td>0.05</td>
</tr>
<tr>
<td>Menticirrhus littoralis</td>
<td>17</td>
<td>0.1</td>
<td>0.25</td>
<td>0.05</td>
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</table>
Table AP17-03. (Continued).

<table>
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<tr>
<th>Species</th>
<th>Number</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td><em>Archosargus probatocephalus</em></td>
<td>12</td>
<td>&lt;0.1</td>
<td>3.3</td>
<td>0.04</td>
</tr>
<tr>
<td><em>Farfantepenaeus duorarum</em></td>
<td>8</td>
<td>&lt;0.1</td>
<td>2.5</td>
<td>0.02</td>
</tr>
<tr>
<td><em>Mugil trichodon</em></td>
<td>3</td>
<td>&lt;0.1</td>
<td>1.3</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Paralichthys lethostigma</em></td>
<td>3</td>
<td>&lt;0.1</td>
<td>0.8</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Albula vulpes</em></td>
<td>3</td>
<td>&lt;0.1</td>
<td>0.4</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Paralichthys squamilens</em></td>
<td>2</td>
<td>&lt;0.1</td>
<td>0.8</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Penaeidae spp.</em></td>
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<td>&lt;0.1</td>
<td>0.8</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Trachinotus carolinus</em></td>
<td>2</td>
<td>&lt;0.1</td>
<td>0.4</td>
<td>0.01</td>
</tr>
<tr>
<td><em>Elops saurus</em></td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.4</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><em>Pogonias cromis</em></td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.4</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><em>Scomberomorus maculatus</em></td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.4</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>14,170</td>
<td>30.0</td>
<td>42.17</td>
<td>8.75</td>
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</tbody>
</table>
Table AP17-04. Catch statistics for 10 dominant taxa collected in 216 183-m haul seine samples during Apalachicola Bay stratified-random sampling, 2017. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>11,681</td>
<td>43.7</td>
<td>84.7</td>
<td>54.08</td>
<td>6.33</td>
</tr>
<tr>
<td>Brevoortia spp.</td>
<td>2,831</td>
<td>10.6</td>
<td>12.5</td>
<td>13.11</td>
<td>7.20</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>2,022</td>
<td>7.6</td>
<td>52.8</td>
<td>9.36</td>
<td>1.56</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>1,318</td>
<td>4.9</td>
<td>73.6</td>
<td>6.10</td>
<td>0.72</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>968</td>
<td>3.6</td>
<td>24.1</td>
<td>4.48</td>
<td>1.02</td>
</tr>
<tr>
<td>Orthopristis chrysoptera</td>
<td>965</td>
<td>3.6</td>
<td>28.7</td>
<td>4.47</td>
<td>1.01</td>
</tr>
<tr>
<td>Bairdiella chrysoura</td>
<td>871</td>
<td>3.3</td>
<td>23.6</td>
<td>4.03</td>
<td>1.18</td>
</tr>
<tr>
<td>Dasyatis sabina</td>
<td>809</td>
<td>3.0</td>
<td>63.4</td>
<td>3.75</td>
<td>0.38</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>566</td>
<td>2.1</td>
<td>39.4</td>
<td>2.62</td>
<td>0.75</td>
</tr>
<tr>
<td>Harengula jaguana</td>
<td>436</td>
<td>1.6</td>
<td>13.9</td>
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<td>0.93</td>
</tr>
<tr>
<td>Subtotals</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Totals</td>
<td>26,713</td>
<td>100.0</td>
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</tbody>
</table>
Table AP17-05. Catch statistics for Selected Taxa collected in 216 183-m haul seine samples during Apalachicola Bay stratified-random sampling, 2017. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>2,022</td>
<td>7.6</td>
<td>52.8</td>
<td>9.36</td>
<td>1.56</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>1,318</td>
<td>4.9</td>
<td>73.6</td>
<td>6.10</td>
<td>0.72</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>968</td>
<td>3.6</td>
<td>24.1</td>
<td>4.48</td>
<td>1.02</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>566</td>
<td>2.1</td>
<td>39.4</td>
<td>2.62</td>
<td>0.75</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>385</td>
<td>1.4</td>
<td>19.9</td>
<td>1.78</td>
<td>1.07</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>337</td>
<td>1.3</td>
<td>46.8</td>
<td>1.56</td>
<td>0.20</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>254</td>
<td>1.0</td>
<td>27.3</td>
<td>1.18</td>
<td>0.28</td>
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<td>Cynoscion nebulosus</td>
<td>241</td>
<td>0.9</td>
<td>36.6</td>
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<td>0.15</td>
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<td>Paralichthys albigutta</td>
<td>193</td>
<td>0.7</td>
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<tr>
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<td>0.54</td>
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<tr>
<td>Callinectes sapidus</td>
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<td>0.11</td>
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<td>0.06</td>
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<td>Menticirrhus americanus</td>
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<td>12.0</td>
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<td>0.08</td>
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<td>Trachinotus carolinus</td>
<td>36</td>
<td>0.1</td>
<td>3.2</td>
<td>0.17</td>
<td>0.09</td>
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<tr>
<td>Menticirrhus littoralis</td>
<td>30</td>
<td>0.1</td>
<td>3.7</td>
<td>0.14</td>
<td>0.08</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>27</td>
<td>0.1</td>
<td>5.6</td>
<td>0.13</td>
<td>0.04</td>
</tr>
<tr>
<td>Farfantepenaeus aztecus</td>
<td>25</td>
<td>0.1</td>
<td>3.7</td>
<td>0.12</td>
<td>0.06</td>
</tr>
<tr>
<td>Species</td>
<td>Number</td>
<td>%</td>
<td>Catch-per-unit-effort (animals/set)</td>
<td>Standard Length (mm)</td>
<td></td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------</td>
<td>--------------------</td>
<td>-------------------------------------</td>
<td>----------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>17</td>
<td>0.1</td>
<td>4.6</td>
<td>0.08</td>
<td>0.03</td>
</tr>
<tr>
<td>Pomatomus saltatrix</td>
<td>13</td>
<td>0.1</td>
<td>4.2</td>
<td>0.06</td>
<td>0.02</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>12</td>
<td>&lt;0.1</td>
<td>2.8</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>Mycteroperca microlepis</td>
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<td>&lt;0.1</td>
<td>0.9</td>
<td>0.06</td>
<td>0.04</td>
</tr>
<tr>
<td>Paralichthys lethostigma</td>
<td>9</td>
<td>&lt;0.1</td>
<td>3.7</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Trachinotus falcatus</td>
<td>8</td>
<td>&lt;0.1</td>
<td>2.8</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Scomberomorus maculatus</td>
<td>8</td>
<td>&lt;0.1</td>
<td>2.3</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Menticirrhus saxatilis</td>
<td>8</td>
<td>&lt;0.1</td>
<td>1.9</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>4</td>
<td>&lt;0.1</td>
<td>1.4</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>3</td>
<td>&lt;0.1</td>
<td>1.4</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Menippe spp.</td>
<td>2</td>
<td>&lt;0.1</td>
<td>0.9</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Megalops atlanticus</td>
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<td>&lt;0.1</td>
<td>0.5</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
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<tr>
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<td>2.80</td>
</tr>
<tr>
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<td>%</td>
<td>% Occur</td>
<td>Density Estimate (animals/100m²)</td>
<td>Standard Length (mm)</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>--------</td>
<td>----</td>
<td>---------</td>
<td>---------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>13,496</td>
<td>38.2</td>
<td>46.5</td>
<td>6.40 (1.56) 292.39 116.95</td>
<td>40 0.11 12 80</td>
</tr>
<tr>
<td>Anchoa hepsetus</td>
<td>3,777</td>
<td>10.7</td>
<td>20.8</td>
<td>1.77 (1.32) 898.92 188.28</td>
<td>25 0.13 13 111</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>2,602</td>
<td>7.4</td>
<td>41.0</td>
<td>1.24 (0.45) 435.65 57.88</td>
<td>36 0.56 8 239</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>2,076</td>
<td>5.9</td>
<td>34.7</td>
<td>0.97 (0.65) 799.13 91.74</td>
<td>20 0.10 6 34</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>2,031</td>
<td>5.7</td>
<td>53.5</td>
<td>0.76 (0.33) 408.97 43.17</td>
<td>46 0.90 7 175</td>
</tr>
<tr>
<td>Etropus crossotus</td>
<td>1,575</td>
<td>4.5</td>
<td>85.4</td>
<td>0.74 (0.07) 106.82 3.64</td>
<td>71 0.44 18 180</td>
</tr>
<tr>
<td>Ariopsis felis</td>
<td>1,061</td>
<td>3.0</td>
<td>38.9</td>
<td>0.50 (0.14) 343.32 13.42</td>
<td>75 0.84 29 274</td>
</tr>
<tr>
<td>Anchoa cubana</td>
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<td>2.1</td>
<td>4.2</td>
<td>0.35 (0.27) 910.10 37.64</td>
<td>22 0.24 16 52</td>
</tr>
<tr>
<td>Orthopristis chrysoptera</td>
<td>698</td>
<td>2.0</td>
<td>36.8</td>
<td>0.33 (0.08) 280.44 5.18</td>
<td>106 1.03 16 180</td>
</tr>
<tr>
<td>Farfantepenaeus aztecus</td>
<td>572</td>
<td>1.6</td>
<td>31.3</td>
<td>0.27 (0.07) 307.63 6.88</td>
<td>20 0.15 15 38</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
<td>28,645</td>
<td>81.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>35,363</td>
<td>100.0</td>
<td></td>
<td>16.68 (2.74) 197.37 262.14</td>
<td></td>
</tr>
</tbody>
</table>

Table AP17-06. Catch statistics for 10 dominant taxa collected in 144 6.1-m bay otter trawl samples during Apalachicola Bay stratified-random sampling, 2017. 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 AP17-07. Catch statistics for Selected Taxa collected in 144 6.1-m bay otter trawl samples during Apalachicola Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>2,602</td>
<td>7.4</td>
<td>41.0</td>
<td>1.24</td>
<td>0.45</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>2,076</td>
<td>5.9</td>
<td>34.7</td>
<td>0.97</td>
<td>0.65</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>2,031</td>
<td>5.7</td>
<td>53.5</td>
<td>0.96</td>
<td>0.33</td>
</tr>
<tr>
<td>Farfantepenaeus aztecs</td>
<td>572</td>
<td>1.6</td>
<td>31.3</td>
<td>0.27</td>
<td>0.07</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>426</td>
<td>1.2</td>
<td>37.5</td>
<td>0.20</td>
<td>0.05</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>293</td>
<td>0.8</td>
<td>41.0</td>
<td>0.14</td>
<td>0.03</td>
</tr>
<tr>
<td>Menticirrus americanus</td>
<td>211</td>
<td>0.6</td>
<td>30.6</td>
<td>0.10</td>
<td>0.03</td>
</tr>
<tr>
<td>Farfantepenaeus duororum</td>
<td>215</td>
<td>0.6</td>
<td>42.4</td>
<td>0.10</td>
<td>0.02</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>203</td>
<td>0.6</td>
<td>38.2</td>
<td>0.10</td>
<td>0.03</td>
</tr>
<tr>
<td>Menippe spp.</td>
<td>197</td>
<td>0.6</td>
<td>16.0</td>
<td>0.09</td>
<td>0.04</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>103</td>
<td>0.3</td>
<td>16.7</td>
<td>0.05</td>
<td>0.03</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>85</td>
<td>0.2</td>
<td>25.0</td>
<td>0.04</td>
<td>0.01</td>
</tr>
<tr>
<td>Cynoscion nothus</td>
<td>4</td>
<td>&lt;0.1</td>
<td>1.4</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Paralichthys lethostigma</td>
<td>4</td>
<td>&lt;0.1</td>
<td>2.8</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>2</td>
<td>&lt;0.1</td>
<td>1.4</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>2</td>
<td>&lt;0.1</td>
<td>1.4</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Penaeidae sp.</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.7</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.7</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Mycteroerpa microlepis</td>
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<td>&lt;0.1</td>
<td>0.7</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Totals</td>
<td>9,029</td>
<td>25.5</td>
<td>.</td>
<td>4.26</td>
<td>1.03</td>
</tr>
</tbody>
</table>
Table AP17-08. Catch statistics for 10 dominant taxa collected in 156 21.3-m river seine samples during Apalachicola Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>3,308</td>
<td>23.8</td>
<td>27.6</td>
<td>31.18</td>
<td>11.61</td>
</tr>
<tr>
<td>Notropis petersoni</td>
<td>2,181</td>
<td>15.7</td>
<td>35.9</td>
<td>20.56</td>
<td>4.71</td>
</tr>
<tr>
<td>Trinectes maculatus</td>
<td>1,068</td>
<td>7.7</td>
<td>60.9</td>
<td>10.07</td>
<td>1.95</td>
</tr>
<tr>
<td>Menidia spp.</td>
<td>924</td>
<td>6.6</td>
<td>26.9</td>
<td>8.71</td>
<td>3.28</td>
</tr>
<tr>
<td>Lucania parva</td>
<td>671</td>
<td>4.8</td>
<td>26.3</td>
<td>6.33</td>
<td>3.35</td>
</tr>
<tr>
<td>Lucania goodei</td>
<td>576</td>
<td>4.1</td>
<td>12.2</td>
<td>5.43</td>
<td>4.62</td>
</tr>
<tr>
<td>Gambusia holbrooki</td>
<td>526</td>
<td>3.8</td>
<td>17.9</td>
<td>4.96</td>
<td>2.53</td>
</tr>
<tr>
<td>Brevoortia spp.</td>
<td>456</td>
<td>3.3</td>
<td>9.6</td>
<td>4.30</td>
<td>2.43</td>
</tr>
<tr>
<td>Ctenogobius boleosoma</td>
<td>455</td>
<td>3.3</td>
<td>34.6</td>
<td>4.29</td>
<td>2.13</td>
</tr>
<tr>
<td>Lepomis punctatus</td>
<td>432</td>
<td>3.1</td>
<td>41.0</td>
<td>4.07</td>
<td>0.91</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
<td>10,597</td>
<td>76.1</td>
<td>62.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>13,921</td>
<td>100.0</td>
<td></td>
<td>131.23</td>
<td>18.63</td>
</tr>
</tbody>
</table>

AP-16
Table AP17-09. Catch statistics for Selected Taxa collected in 156 21.3-m river seine samples during Apalachicola Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number No.</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m$^2$)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>346</td>
<td>2.5</td>
<td>48.7</td>
<td>3.26</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>114</td>
<td>0.8</td>
<td>6.4</td>
<td>1.07</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>71</td>
<td>0.5</td>
<td>2.6</td>
<td>0.67</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>60</td>
<td>0.4</td>
<td>6.4</td>
<td>0.57</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>43</td>
<td>0.3</td>
<td>12.8</td>
<td>0.41</td>
</tr>
<tr>
<td>Leioptomus xanthurus</td>
<td>13</td>
<td>0.1</td>
<td>2.6</td>
<td>0.12</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>13</td>
<td>0.1</td>
<td>5.1</td>
<td>0.12</td>
</tr>
<tr>
<td>Paralichthys lethostigma</td>
<td>9</td>
<td>0.1</td>
<td>2.6</td>
<td>0.08</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>9</td>
<td>0.1</td>
<td>0.6</td>
<td>0.08</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>6</td>
<td>&lt;0.1</td>
<td>1.3</td>
<td>0.06</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>4</td>
<td>&lt;0.1</td>
<td>1.9</td>
<td>0.04</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>3</td>
<td>&lt;0.1</td>
<td>1.9</td>
<td>0.03</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>2</td>
<td>&lt;0.1</td>
<td>0.6</td>
<td>0.02</td>
</tr>
<tr>
<td>Farfantepenaeus aztecs</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.6</td>
<td>0.01</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.6</td>
<td>0.01</td>
</tr>
<tr>
<td>Totals</td>
<td>695</td>
<td>5.0</td>
<td>.</td>
<td>6.55</td>
</tr>
</tbody>
</table>
Table AP17-10. Catch statistics for 10 dominant taxa collected in 84 6.1-m river otter trawl samples during Apalachicola Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Occur Mean Stderr CV Max</td>
<td>Mean Stderr Min Max</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>42,897</td>
<td>86.1</td>
<td>57.1 68.68 33.15 442.40 2,451.57</td>
<td>25 0.03 17 70</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>2,138</td>
<td>4.3</td>
<td>32.1 3.43 2.43 647.73 199.54</td>
<td>49 0.27 6 149</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>922</td>
<td>1.9</td>
<td>20.2 1.48 0.73 448.89 41.96</td>
<td>11 0.15 2 24</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>827</td>
<td>1.7</td>
<td>29.8 1.28 0.48 340.05 22.67</td>
<td>35 0.76 8 175</td>
</tr>
<tr>
<td>Trinectes maculatus</td>
<td>470</td>
<td>0.9</td>
<td>54.8 0.73 0.15 186.17 5.80</td>
<td>31 0.75 7 70</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>448</td>
<td>0.9</td>
<td>56.0 0.70 0.19 243.27 10.66</td>
<td>30 1.74 5 177</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>437</td>
<td>0.9</td>
<td>38.1 0.70 0.17 218.90 8.50</td>
<td>25 0.36 11 39</td>
</tr>
<tr>
<td>Ictalurus punctatus</td>
<td>294</td>
<td>0.6</td>
<td>35.7 0.47 0.13 258.76 6.21</td>
<td>78 2.41 16 390</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>237</td>
<td>0.5</td>
<td>15.5 0.38 0.14 331.03 7.29</td>
<td>10 0.17 4 14</td>
</tr>
<tr>
<td>Ictalurus furcatus</td>
<td>187</td>
<td>0.4</td>
<td>13.1 0.30 0.17 530.22 13.36</td>
<td>108 3.03 21 220</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
<td>48,857</td>
<td>98.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>49,854</td>
<td>100.0</td>
<td>79.72 33.39 383.83 2,461.14</td>
<td></td>
</tr>
</tbody>
</table>
Table AP17-11. Catch statistics for Selected Taxa collected in 84 6.1-m river otter trawl samples during Apalachicola Bay stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number No.</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Cynoscion arenarius</td>
<td>2,138</td>
<td>4.3</td>
<td>32.1</td>
<td>3.43</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>922</td>
<td>1.9</td>
<td>20.2</td>
<td>1.48</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>827</td>
<td>1.7</td>
<td>29.8</td>
<td>1.28</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>448</td>
<td>0.9</td>
<td>56.0</td>
<td>0.70</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>237</td>
<td>0.5</td>
<td>15.5</td>
<td>0.38</td>
</tr>
<tr>
<td>Farfantepenaeus aztecsus</td>
<td>78</td>
<td>0.2</td>
<td>4.8</td>
<td>0.13</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>56</td>
<td>0.1</td>
<td>17.9</td>
<td>0.09</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>12</td>
<td>&lt;0.1</td>
<td>9.5</td>
<td>0.02</td>
</tr>
<tr>
<td>Paralichthys lethostigma</td>
<td>12</td>
<td>&lt;0.1</td>
<td>9.5</td>
<td>0.02</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>6</td>
<td>&lt;0.1</td>
<td>3.6</td>
<td>0.01</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>5</td>
<td>&lt;0.1</td>
<td>2.4</td>
<td>0.01</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>4</td>
<td>&lt;0.1</td>
<td>2.4</td>
<td>0.01</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>3</td>
<td>&lt;0.1</td>
<td>3.6</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Pogonias cromis</td>
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<td>&lt;0.1</td>
<td>2.4</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>2</td>
<td>&lt;0.1</td>
<td>2.4</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>4,753</strong></td>
<td><strong>9.5</strong></td>
<td><strong>.</strong></td>
<td><strong>7.57</strong></td>
</tr>
</tbody>
</table>
Appendix AP17-01. Monthly summary of species collected during Apalachicola Bay stratified-random sampling, 2017. Effort, or total number of hauls, is labeled ‘E’. Taxa are arranged alphabetically.

<table>
<thead>
<tr>
<th>Species</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acanthostracion quadricornis</td>
<td>1</td>
<td>3</td>
<td>.</td>
<td>1</td>
<td>1</td>
<td>.</td>
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<td>3</td>
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<td>.</td>
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<td>12</td>
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<tr>
<td>Achirus lineatus</td>
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<tr>
<td>Adinia xenica</td>
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<td>Aetobatus narinari</td>
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<tr>
<td>Albula vulpes</td>
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<td>3</td>
</tr>
<tr>
<td>Alosa chrysochloris</td>
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<td>Aluterus schoepfii</td>
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<td>1</td>
<td>1</td>
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<td>4</td>
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<tr>
<td>Ameiurus catus</td>
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<td>1</td>
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</tr>
<tr>
<td>Amia calva</td>
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</tr>
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<td>Anarchopterus criniger</td>
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<td>.</td>
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</tr>
<tr>
<td>Anchoa cubana</td>
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<td>558</td>
<td>5</td>
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<td>1</td>
<td>100</td>
<td>6</td>
<td>.</td>
<td>.</td>
<td>864</td>
</tr>
<tr>
<td>Anchoa hepsetus</td>
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<td>.</td>
<td>1</td>
<td>2</td>
<td>3,632</td>
<td>347</td>
<td>76</td>
<td>34</td>
<td>94</td>
<td>46</td>
<td>73</td>
<td>.</td>
<td>4,305</td>
</tr>
<tr>
<td>Anchoa lyolepis</td>
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<td>6</td>
<td>1</td>
<td>.</td>
<td>401</td>
<td>4</td>
<td>24</td>
<td>1</td>
<td>125</td>
<td>2</td>
<td>.</td>
<td>564</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>47</td>
<td>253</td>
<td>672</td>
<td>405</td>
<td>15,477</td>
<td>6,483</td>
<td>2,884</td>
<td>3,829</td>
<td>7,323</td>
<td>3,560</td>
<td>3,041</td>
<td>20,513</td>
<td>64,487</td>
</tr>
<tr>
<td>Anchoa spp.</td>
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<td>.</td>
<td>104</td>
<td>.</td>
<td>.</td>
<td>348</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>452</td>
</tr>
<tr>
<td>Ancylopsetta quadrocellata</td>
<td>4</td>
<td>4</td>
<td>17</td>
<td>4</td>
<td>9</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>54</td>
</tr>
<tr>
<td>Anguilla rostrata</td>
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<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>1</td>
</tr>
<tr>
<td>Aphredoderus sayanus</td>
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Appendix AP17-02. Summary by gear, stratum, and zone of species collected during Apalachicola Bay stratified-random sampling, 2017. Sampling with 21.3-m bay seine was stratified by the presence or absence of a shoreline (‘Shore’ or offshore) within 5-m. Offshore sets were post-stratified by the presence or absence of bottom vegetation (‘Veg’ or ‘Unveg’). Sampling with 21.3-m river seine, 183-m haul seine, and 6.1-m otter trawl were not stratified. Zones A and B were located in Apalachicola Bay, and Zone C encompassed the lower Apalachicola River. Effort, or the total number of hauls, is labeled ‘E’. Taxa are arranged alphabetically.

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## Appendix AP17-02. (Continued)

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<td>3,770</td>
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Southern Indian River Lagoon

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

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in the southern IRL utilizing 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 TQ17-01). 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 TQ17-01). 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.

The Loxahatchee River (Zone L; Figure TQ17-01) was also added to the 21.3-m seine sampling universe. The Loxahatchee River covers an ecosystem of approximately 673 km² in Martin and Palm Beach county 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 sampling methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2017 in the southern IRL.

**Stratified-Random Sampling**

A total of 69,563 animals, which included 162 taxa of fishes and 12 taxa of selected invertebrates, were collected from 420 southern IRL samples in 2017 (Table TQ17-01; Appendices TQ17-01 and TQ17-02). *Anchoa mitchilli* (n=18,596) was the most numerous species collected, representing 26.7% of the total catch. The four next most abundant taxa, *Eucinostomus* spp. (n=9,705), *Anchoa lamprotaenia* (n=3,717), *Diapterus auratus* (n=3,266), and *Lagodon rhomboides* (n=3,231) accounted for an additional 28.7% of the total catch. Thirty Selected Taxa (n=8,198 animals) composed 11.8% of the total catch. *Mugil curema* (n=2,365), *Centropomus undecimalis* (n=1,061), *Farfantepenaeus* spp. (n=945), and *Elops saurus* (n=790) were the most abundant Selected Taxa, representing 7.4% of the total catch. Collections in 2017 included six species new to the southern IRL FIM collection: *Astrapogon* spp. (Cardinalfish), *Callinectes exasperatus* (Rugose Swimming Crab), *Coryphaena hippurus* (Dolphin), *Ctenogobius stigmaticus* (Spottail Goby), *Farfantepenaeus aztecus* (Brown Shrimp), *Histrio histrio* (Sargassumfish), *Nes longus* (Orangespotted Goby), and *Pomadasys crocro* (Burro Grunt).

**183-m Haul Seines.** A total of 15,177 animals were collected in 144 183-m haul seines, representing 21.8% of the overall SRS collections (Table TQ17-01, Appendix TQ17-02). *Lagodon rhomboides* (n=2,551), *D. auratus* (n=2,333), and *M. curema* (n=1,839) were the most numerous taxa collected, representing 44.3% of the 183-m haul seine catch (Table TQ17-02). The taxa most frequently caught in 183-m haul seines were *Archosargus probatocephalus* (72.9% occurrence), *M. curema* (66.0% occurrence), *D. auratus* (63.9% occurrence), *C. undecimalis* (63.2% occurrence), and *Ariopsis felis* (60.4% occurrence).
A total of 5,387 animals from 27 Selected Taxa were collected, representing 35.5% of the entire 183-m haul seine catch (Table TQ17-03). *Mugil curema* (n=1,839), *E. saurus* (n=783), and *A. probatocephalus* (n=728) were the most abundant Selected Taxa, accounting for 62.2% of the Selected Taxa collected with this gear. The Selected Taxa most frequently caught in 183-m haul seines were *A. probatocephalus* (72.9% occurrence), *M. curema* (66.0% occurrence), *C. undecimalis* (63.2% occurrence), and *Mugil cephalus* (47.9% occurrence).

**River Sampling**

21.3-m River Seines. A total of 54,386 animals were collected in 276 21.3-m river seines, representing 78.2% of the overall SRS collections (Table TQ17-01, Appendix TQ17-02). *Anchoa mitchilli* (n=18,596) was the most abundant species collected, accounting for 34.2% of the 21.3-m river seine catch (Table TQ17-04). The taxa most frequently caught in 21.3-m river seines were *Eucinostomus* spp. (71.0% occurrence), *Menidia* spp. (48.9% occurrence), *Eucinostomus harengulus* (48.2% occurrence), *Farfantepenaeus* spp. (47.5% occurrence), and *Eugerres plumieri* (42.4% occurrence).

A total of 2,811 animals from 19 Selected Taxa were collected, representing 5.2% of the entire 21.3-m river seine catch (Table TQ17-05). *Farfantepenaeus* spp. (n=944), *M. curema* (n=526), and *C. undecimalis* (n=493) were the most abundant Selected Taxa, accounting for 69.8% of the Selected Taxa collected in this gear. The Selected Taxa most frequently caught in 21.3-m river seines were *Farfantepenaeus* spp. (47.5% occurrence), *Centropomus undecimalis* (36.6% occurrence), and *Callinectes sapidus* (23.2% occurrence).

**Reference**

Figure TQ17-01. Map of southern Indian River Lagoon sampling area, separated into four geographic zones: I, J, L, and T.
Table TQ17-01. Summary of catch and effort data for southern Indian River Lagoon stratified-random sampling, 2017.

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<td>Hauls</td>
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<td>T</td>
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Table TQ17-02. Catch statistics for 10 dominant taxa collected in 144 183-m haul seine samples during southern Indian River Lagoon stratified-random sampling, 2017. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

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<th>Species</th>
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<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
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<td>Stderr</td>
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<td>Ariopsis felis</td>
<td>997</td>
<td>6.57</td>
<td>60.4</td>
<td>6.92</td>
<td>2.00</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>783</td>
<td>5.16</td>
<td>34.0</td>
<td>5.44</td>
<td>4.09</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>728</td>
<td>4.80</td>
<td>72.9</td>
<td>5.06</td>
<td>0.66</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>679</td>
<td>4.47</td>
<td>22.9</td>
<td>4.72</td>
<td>2.02</td>
</tr>
<tr>
<td>Eucinostomus gula</td>
<td>607</td>
<td>4.00</td>
<td>36.8</td>
<td>4.22</td>
<td>1.13</td>
</tr>
<tr>
<td>Archosargus rhomboidalis</td>
<td>607</td>
<td>4.00</td>
<td>25.0</td>
<td>4.22</td>
<td>1.58</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>568</td>
<td>3.74</td>
<td>63.2</td>
<td>3.94</td>
<td>0.79</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
<td>11,692</td>
<td>77.04</td>
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<td>.</td>
<td>.</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>15,177</td>
<td>100</td>
<td>.</td>
<td>105.4</td>
<td>12.4</td>
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</tbody>
</table>
Table TQ17-03. Catch statistics for Selected Taxa collected in 144 183-m haul seine samples during southern Indian River Lagoon stratified-random sampling, 2017. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Mean Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>1,839</td>
<td>12.12</td>
<td>66.0</td>
<td>12.77</td>
<td>3.89</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>783</td>
<td>5.16</td>
<td>34.0</td>
<td>5.44</td>
<td>4.09</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>728</td>
<td>4.80</td>
<td>72.9</td>
<td>5.06</td>
<td>0.66</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>568</td>
<td>3.74</td>
<td>63.2</td>
<td>3.94</td>
<td>0.79</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>556</td>
<td>3.66</td>
<td>47.9</td>
<td>3.86</td>
<td>1.01</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>311</td>
<td>2.05</td>
<td>21.5</td>
<td>2.16</td>
<td>0.77</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>175</td>
<td>1.15</td>
<td>17.4</td>
<td>1.22</td>
<td>0.67</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>124</td>
<td>0.82</td>
<td>13.9</td>
<td>0.86</td>
<td>0.33</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>60</td>
<td>0.40</td>
<td>19.4</td>
<td>0.42</td>
<td>0.09</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>56</td>
<td>0.37</td>
<td>14.6</td>
<td>0.39</td>
<td>0.15</td>
</tr>
<tr>
<td>Trachinotus falcatus</td>
<td>54</td>
<td>0.36</td>
<td>4.2</td>
<td>0.38</td>
<td>0.29</td>
</tr>
<tr>
<td>Lutjanus analis</td>
<td>40</td>
<td>0.26</td>
<td>9.7</td>
<td>0.28</td>
<td>0.11</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>24</td>
<td>0.16</td>
<td>2.8</td>
<td>0.17</td>
<td>0.10</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
<td>20</td>
<td>0.13</td>
<td>6.3</td>
<td>0.14</td>
<td>0.06</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>20</td>
<td>0.13</td>
<td>4.9</td>
<td>0.14</td>
<td>0.06</td>
</tr>
<tr>
<td>Albula vulpes</td>
<td>9</td>
<td>0.06</td>
<td>2.8</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>5</td>
<td>0.03</td>
<td>2.8</td>
<td>0.03</td>
<td>0.02</td>
</tr>
</tbody>
</table>
Table TQ17-03. (Continued).

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td><strong>Leiostomus xanthurus</strong></td>
<td>4</td>
<td>0.03</td>
<td>2.1</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td><strong>Megalops atlanticus</strong></td>
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<td>0.01</td>
<td>1.4</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Pomatomus saltatrix</strong></td>
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<td>0.01</td>
<td>1.4</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Farfantepenaeus spp.</strong></td>
<td>1</td>
<td>0.01</td>
<td>0.7</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Mycteroperca microlepis</strong></td>
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<td>0.01</td>
<td>0.7</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Trachinotus carolinus</strong></td>
<td>1</td>
<td>0.01</td>
<td>0.7</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Lutjanus cyanopterus</strong></td>
<td>1</td>
<td>0.01</td>
<td>0.7</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Lutjanus apodus</strong></td>
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<td>0.01</td>
<td>0.7</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Scomberomorus regalis</strong></td>
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<td>0.01</td>
<td>0.7</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Paralichthys lethostigma</strong></td>
<td>1</td>
<td>0.01</td>
<td>0.7</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>5,387</td>
<td>35.49</td>
<td></td>
<td>37.41</td>
<td>6.68</td>
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</tbody>
</table>
Table TQ17-04. Catch statistics for 10 dominant taxa collected in 276 21.3-m river seine samples during southern Indian River Lagoon stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>18,596</td>
<td>34.19</td>
<td>29.3</td>
<td>99.08</td>
<td>37.00</td>
</tr>
<tr>
<td>Eucinostomus spp.</td>
<td>9,705</td>
<td>17.84</td>
<td>71.0</td>
<td>51.71</td>
<td>7.74</td>
</tr>
<tr>
<td>Anchoa lamprotaenia</td>
<td>3,717</td>
<td>6.96</td>
<td>3.3</td>
<td>20.18</td>
<td>17.21</td>
</tr>
<tr>
<td>Brevoortia spp.</td>
<td>2,971</td>
<td>5.46</td>
<td>12.7</td>
<td>15.83</td>
<td>5.95</td>
</tr>
<tr>
<td>Menidia spp.</td>
<td>2,906</td>
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<td>48.9</td>
<td>15.48</td>
<td>3.45</td>
</tr>
<tr>
<td>Eugerres plumieri</td>
<td>2,794</td>
<td>5.14</td>
<td>42.4</td>
<td>14.89</td>
<td>3.13</td>
</tr>
<tr>
<td>Gambusia holbrooki</td>
<td>1,627</td>
<td>2.99</td>
<td>23.9</td>
<td>8.67</td>
<td>2.64</td>
</tr>
<tr>
<td>Harengula jaguana</td>
<td>1,587</td>
<td>2.92</td>
<td>5.4</td>
<td>8.46</td>
<td>4.65</td>
</tr>
<tr>
<td>Eucinostomus harengulus</td>
<td>1,372</td>
<td>2.52</td>
<td>48.2</td>
<td>7.31</td>
<td>1.14</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>944</td>
<td>1.74</td>
<td>47.5</td>
<td>5.03</td>
<td>0.63</td>
</tr>
<tr>
<td>Subtotals</td>
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<tr>
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<td>54,386</td>
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<td>.</td>
<td>289.78</td>
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</tbody>
</table>

TQ-9
Table TQ17-05. Catch statistics for Selected Taxa collected in 276 21.3-m river seine samples during Southern Indian River Lagoon stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Occur</td>
<td>Mean</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>944</td>
<td>1.74</td>
<td>47.5</td>
<td>5.03</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>526</td>
<td>0.97</td>
<td>14.5</td>
<td>2.80</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
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<td>0.91</td>
<td>36.6</td>
<td>2.63</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>161</td>
<td>0.30</td>
<td>11.6</td>
<td>0.86</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>148</td>
<td>0.27</td>
<td>23.2</td>
<td>0.79</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>115</td>
<td>0.21</td>
<td>13.8</td>
<td>0.61</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
<td>91</td>
<td>0.17</td>
<td>13.8</td>
<td>0.48</td>
</tr>
<tr>
<td>Mugil rubrioculus</td>
<td>88</td>
<td>0.16</td>
<td>2.5</td>
<td>0.47</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>67</td>
<td>0.12</td>
<td>4.3</td>
<td>0.36</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>46</td>
<td>0.08</td>
<td>5.4</td>
<td>0.25</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>45</td>
<td>0.08</td>
<td>10.9</td>
<td>0.24</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
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</tr>
<tr>
<td>Trachinotus falcatus</td>
<td>14</td>
<td>0.03</td>
<td>1.8</td>
<td>0.07</td>
</tr>
<tr>
<td>Albula vulpes</td>
<td>13</td>
<td>0.02</td>
<td>0.7</td>
<td>0.07</td>
</tr>
<tr>
<td>Elops saurus</td>
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<td>0.01</td>
<td>2.5</td>
<td>0.04</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
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</tr>
<tr>
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<td>0.01</td>
<td>1.1</td>
<td>0.03</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
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<td>0.01</td>
</tr>
<tr>
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<tr>
<td><strong>Totals</strong></td>
<td><strong>2,811</strong></td>
<td>5.17</td>
<td>.</td>
<td><strong>14.98</strong></td>
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</tbody>
</table>
Appendix TQ17-01. Monthly summary of species collected during southern Indian River Lagoon stratified-random sampling, 2017. Effort, or total number of hauls, is labeled ‘E’. Taxa are arranged alphabetically.

<table>
<thead>
<tr>
<th>Species</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acanthostracion quadricornis</td>
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<td>.</td>
<td>.</td>
<td>2</td>
</tr>
<tr>
<td>Achirus lineatus</td>
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<td>6</td>
<td>3</td>
<td>13</td>
<td>11</td>
<td>9</td>
<td>6</td>
<td>4</td>
<td>2</td>
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<td>.</td>
<td>.</td>
<td>64</td>
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<td>.</td>
<td>1</td>
</tr>
<tr>
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<td>4</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>5</td>
</tr>
<tr>
<td>Albula vulpes</td>
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<td>10</td>
<td>.</td>
<td>4</td>
<td>.</td>
<td>2</td>
<td>.</td>
<td>3</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>22</td>
</tr>
<tr>
<td>Amia calva</td>
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<td>.</td>
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<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>3</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Anchoa cubana</td>
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<td>.</td>
<td>.</td>
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<td>.</td>
<td>.</td>
<td>107</td>
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<tr>
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<td>.</td>
<td>32</td>
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<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>37</td>
</tr>
<tr>
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<td>321</td>
<td>157</td>
<td>.</td>
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<td>.</td>
<td>3,717</td>
</tr>
<tr>
<td>Anchoa liolepis</td>
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<td>.</td>
<td>321</td>
<td>157</td>
<td>.</td>
<td>3,221</td>
<td>.</td>
<td>.</td>
<td>1</td>
<td>.</td>
<td>74</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
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<td>358</td>
<td>1,089</td>
<td>7,368</td>
<td>1,316</td>
<td>517</td>
<td>108</td>
<td>14</td>
<td>72</td>
<td>188</td>
<td>1,078</td>
<td>77</td>
<td>18,596</td>
</tr>
<tr>
<td>Anchoa spp.</td>
<td>.</td>
<td>.</td>
<td>70</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>1</td>
<td>.</td>
<td>.</td>
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## Appendix TQ17-02

Summary by gear, stratum and zone of species collected during southern Indian River Lagoon stratified-random sampling, 2017. Sampling with 183-m haul seines and 21.3-m river seines was post-stratified by the presence or absence of overhanging vegetation ('Over' or 'Nonover'). Zones I and J were located in the Indian River, and Zone L and T encompassed the St. Lucie and Loxahatchee Rivers. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

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### Gear and Strata

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</table>

TQ-26
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 JX17-01). Shoreline vegetation in the lower St. Marys and Nassau rivers is characterized by an expansive saltmarsh system, while the lower St. Johns River is characterized by marshes, hardwood forests, and hardwood swamps (St. Johns River Water Management District 1993; St. Johns River Water Management District 2000). Bottom substrates are typically characterized as mud, sand, and occasional oysters (Solomon et al. 2006). Bottom vegetation is only present in the oligohaline reaches of the St. Johns River upriver of downtown Jacksonville (Burns et al. 1997).

The Fisheries-Independent Monitoring (FIM) program has conducted intensive sampling of fish and selected invertebrates in northeast Florida since 2001. The area sampled was divided into six geographically-defined riverine zones (A–F; Figure JX17-01). Monthly stratified-random sampling (SRS) was conducted in Zones A–D using 21.3-m river seines, 183-m haul seines, and 6.1-m river otter trawls. Monthly SRS was conducted in Zone E and F with only 21.3-m river seines and 6.1-m river otter trawls. All methods were the same as those described in the Methods section of this report. This section summarizes data collected by the FIM program during 2017 in northeast Florida.

Stratified-Random Sampling

A total of 204,080 animals, which included 154 taxa of fishes and 14 taxa of selected invertebrates, were collected from 1,356 northeast Florida samples in 2017 (Table JX17-01; Appendices JX17-01 and -02). Anchoa mitchilli (n=79,157) was the most numerous species collected, representing 38.8% of the total catch. The next three most abundant taxa, Litopenaeus setiferus (n=18,381), Micropogonias undulatus (n=16,607), and Menidia menidia (n=9,439) accounted for an additional 21.8% of the total catch. Thirty-six Selected Taxa (n=54,104 animals) composed 26.5% of the total catch. Litopenaeus setiferus (n=18,381) was the most abundant Selected Taxon, representing
9.0% of the annual catch. *Micropogonias undulatus* (n=16,607) and *Leiostomus xanthurus* (n=6,950) were the next two most abundant Selected Taxa, comprising 11.5% of the total catch. Collections in 2017 included four taxa new to the northeast Florida FIM collection: *Eucinostomus lefroyi* (Mottled Mojarra), *Lutjanus campechanus* (Red Snapper), *Trachinotus goodei* (Palometa), and *Scorpaena plumieri* (Spotted Scorpionfish).

21.3-m River Seines. A total of 140,195 animals were collected in 576 21.3-m river seine samples, representing 68.7% of the overall SRS collections (Table JX17-01). *Anchoa mitchilli* (n=64,830) was the most abundant species, accounting for 46.2% of the 21.3-m river seine catch (Table JX17-02). *Menidia menidia* (n=9,437), *L. setiferus* (n=8,658), and *Menidia* spp. (n=7,119) were the next three most abundant species, accounting for an additional 18.0% of the 21.3-m river seine catch. The taxa most frequently caught in 21.3-m river seines were *A. mitchilli* (43.6% occurrence), *Menidia* spp. (38.0% occurrence), and *Menidia menidia* (33.5% occurrence).

A total of 22,486 animals from 29 Selected Taxa were collected, representing 16.0% of the entire 21.3-m river seine catch (Table JX17-03). *Litopenaeus setiferus* (n=8,658), *Leiostomus xanthurus* (n=5,640), and *Mugil cephalus* (n=4,722) were the most abundant Selected Taxa, accounting for 84.6% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 21.3-m river seines were *Leiostomus xanthurus* (27.6% occurrence), *Callinectes sapidus* (24.1% occurrence), and *Litopenaeus setiferus* (22.2% occurrence).

183-m Haul Seines. A total of 5,986 animals were collected in 192 183-m haul seines, representing 2.9% of the overall SRS catch (Table JX17-01). *Mugil cephalus* (n=1,203) was the most abundant species, accounting for 20.1% of the 183-m haul seine catch (Table JX17-04). *Eucinostomus harengulus* (n=725), *L. xanthurus* (n=493), and *Bairdiella chrysoura* (n=476) were the next most abundant species, accounting for an additional 28.3% of the 183-m haul seine catch. The taxa most frequently caught in the 183-m haul seines were *Mugil cephalus* (56.8% occurrence), *M. curema* (37.5% occurrence), and *Lagodon rhomboides* (36.5% occurrence).

A total of 3,068 animals from 25 Selected Taxa were collected, representing 51.3% of the entire 183-m haul seine catch (Table JX17-05). *Mugil cephalus* (n=1,203),
Leiostomus xanthurus (n=493), and Litopenaeus setiferus (n=393) were the most abundant Selected Taxa, accounting for 68.1% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in 183-m haul seines were Mugil cephalus (56.8% occurrence), M. curema (37.5% occurrence), and L. xanthurus (29.7% occurrence).

6.1-m River Otter Trawl. A total of 57,899 animals were collected in 588 6.1-m river otter trawl samples, representing 28.4% of the overall SRS catch (Table JX17-01). Micropogonias undulatus (n=14,767) and A. mitchilli (n=14,327) were the most abundant species, accounting for 50.2% of the 6.1-m river otter trawl catch (Table JX17-06). Litopenaeus setiferus (n=9,330) and Stellifer lanceolatus (n=7,395) were the next two most abundant species, accounting for an additional 28.9% of the 6.1-m river otter trawl catch (Table JX17-06). The taxa most frequently caught in 6.1-m river otter trawls were M. undulatus (61.9% occurrence), C. sapidus (59.7% occurrence), L. setiferus (48.5% occurrence), and A. mitchilli (45.9% occurrence).

A total of 28,550 animals from 26 Selected Taxa were collected, representing 49.3% of the entire 6.1-m river otter trawl catch (Table JX17-07). Micropogonias undulatus (n=14,767), L. setiferus (n=9,330), and C. sapidus (n=1,388) were the most abundant Selected Taxa, accounting for 89.3% of the Selected Taxa collected by this gear. The Selected Taxa most frequently caught in the 6.1-m river otter trawls were M. undulatus (61.9% occurrence), C. sapidus (59.7% occurrence), and L. setiferus (48.5% occurrence).
References


Figure JX17-01. Map of northeast Florida sampling area. Zones are labeled A–F. ICW = Intracoastal Waterway.
Table JX17-01. Summary of catch and effort data for northeast Florida stratified-random sampling, 2017.

<table>
<thead>
<tr>
<th>Zone</th>
<th>21.3-m river seine</th>
<th>183-m haul seine</th>
<th>6.1-m otter trawl</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Animals</td>
<td>Hauls</td>
<td>Animals</td>
<td>Hauls</td>
</tr>
<tr>
<td>A</td>
<td>41,690</td>
<td>84</td>
<td>1,204</td>
<td>36</td>
</tr>
<tr>
<td>B</td>
<td>32,206</td>
<td>84</td>
<td>1,620</td>
<td>36</td>
</tr>
<tr>
<td>C</td>
<td>31,167</td>
<td>108</td>
<td>1,676</td>
<td>60</td>
</tr>
<tr>
<td>D</td>
<td>10,535</td>
<td>108</td>
<td>1,486</td>
<td>60</td>
</tr>
<tr>
<td>E</td>
<td>11,702</td>
<td>96</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td>F</td>
<td>12,895</td>
<td>96</td>
<td>.</td>
<td>.</td>
</tr>
<tr>
<td></td>
<td><strong>Totals</strong></td>
<td><strong>576</strong></td>
<td><strong>5,986</strong></td>
<td><strong>192</strong></td>
</tr>
</tbody>
</table>
Table JX17-02.  Catch statistics for 10 dominant taxa collected in 576 21.3-m river seine samples during northeast Florida stratified-random sampling, 2017.  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>
<thead>
<tr>
<th>Species</th>
<th>Number No.</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td><strong>Anchoa mitchilli</strong></td>
<td>64,830</td>
<td>46.2</td>
<td>43.6</td>
<td>165.52</td>
<td>25.41</td>
</tr>
<tr>
<td><strong>Menidia menidia</strong></td>
<td>9,437</td>
<td>6.7</td>
<td>33.5</td>
<td>24.09</td>
<td>5.54</td>
</tr>
<tr>
<td><strong>Litopenaeus setiferus</strong></td>
<td>8,658</td>
<td>6.2</td>
<td>22.2</td>
<td>22.10</td>
<td>5.13</td>
</tr>
<tr>
<td><strong>Menidia spp.</strong></td>
<td>7,119</td>
<td>5.1</td>
<td>38.0</td>
<td>18.18</td>
<td>3.30</td>
</tr>
<tr>
<td><strong>Anchoa hepsetus</strong></td>
<td>6,967</td>
<td>5.0</td>
<td>17.5</td>
<td>17.79</td>
<td>5.86</td>
</tr>
<tr>
<td><strong>Leiostomus xanthurus</strong></td>
<td>5,640</td>
<td>4.0</td>
<td>27.6</td>
<td>14.40</td>
<td>3.09</td>
</tr>
<tr>
<td><strong>Lucania parva</strong></td>
<td>5,416</td>
<td>3.9</td>
<td>18.8</td>
<td>13.83</td>
<td>2.03</td>
</tr>
<tr>
<td><strong>Mugil cephalus</strong></td>
<td>4,722</td>
<td>3.4</td>
<td>14.1</td>
<td>12.06</td>
<td>10.36</td>
</tr>
<tr>
<td><strong>Eucinostomus spp.</strong></td>
<td>3,039</td>
<td>2.2</td>
<td>24.8</td>
<td>7.76</td>
<td>2.82</td>
</tr>
<tr>
<td><strong>Fundulus heteroclitus</strong></td>
<td>2,374</td>
<td>1.7</td>
<td>12.8</td>
<td>6.06</td>
<td>2.76</td>
</tr>
</tbody>
</table>

| Subtotals                | 118,202    | 84.3 | .       | .     | .      | .       | .       | 3  | 294 |
| **Totals**               | 140,195    | 100.0| 357.93  | 32.34 | 216.84 | 7,629.41| .       | .  | 3   | 819|


Table JX17-03. Catch statistics for Selected Taxa collected in 576 21.3-m river seine samples during northeast Florida stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>8,658</td>
<td>6.2</td>
<td>22.2</td>
<td>22.10</td>
<td>5.13</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>5,640</td>
<td>4.0</td>
<td>27.6</td>
<td>14.40</td>
<td>3.09</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>4,722</td>
<td>3.4</td>
<td>14.1</td>
<td>12.06</td>
<td>10.36</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>1,739</td>
<td>1.2</td>
<td>17.9</td>
<td>4.44</td>
<td>1.43</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>473</td>
<td>0.3</td>
<td>12.7</td>
<td>1.21</td>
<td>0.51</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>329</td>
<td>0.2</td>
<td>24.1</td>
<td>0.84</td>
<td>0.10</td>
</tr>
<tr>
<td>Farfantepenaeus spp.</td>
<td>329</td>
<td>0.2</td>
<td>11.6</td>
<td>0.84</td>
<td>0.19</td>
</tr>
<tr>
<td>Trachinotus carolinus</td>
<td>105</td>
<td>0.1</td>
<td>1.9</td>
<td>0.27</td>
<td>0.12</td>
</tr>
<tr>
<td>Elops saurus</td>
<td>105</td>
<td>0.1</td>
<td>7.1</td>
<td>0.27</td>
<td>0.06</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>59</td>
<td>&lt;0.1</td>
<td>5.2</td>
<td>0.15</td>
<td>0.03</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
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<td>&lt;0.1</td>
<td>4.0</td>
<td>0.13</td>
<td>0.03</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>43</td>
<td>&lt;0.1</td>
<td>3.0</td>
<td>0.11</td>
<td>0.04</td>
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<tr>
<td>Farfantepenaeus aztecus</td>
<td>28</td>
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<td>2.3</td>
<td>0.07</td>
<td>0.03</td>
</tr>
<tr>
<td>Trachinotus falcatus</td>
<td>27</td>
<td>&lt;0.1</td>
<td>2.4</td>
<td>0.07</td>
<td>0.03</td>
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<tr>
<td>Lutjanus griseus</td>
<td>27</td>
<td>&lt;0.1</td>
<td>3.8</td>
<td>0.07</td>
<td>0.02</td>
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<tr>
<td>Archosargus probatocephalus</td>
<td>25</td>
<td>&lt;0.1</td>
<td>1.6</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>Paralichthys lethostigma</td>
<td>25</td>
<td>&lt;0.1</td>
<td>2.6</td>
<td>0.06</td>
<td>0.02</td>
</tr>
<tr>
<td>Paralichthys albigutta</td>
<td>22</td>
<td>&lt;0.1</td>
<td>2.8</td>
<td>0.06</td>
<td>0.02</td>
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Table JX17-03. (Continued).

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<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Occur</td>
<td>Mean</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
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<td>1.9</td>
<td>0.04</td>
</tr>
<tr>
<td>Menticirrhus littoralis</td>
<td>16</td>
<td>&lt;0.1</td>
<td>0.7</td>
<td>0.04</td>
</tr>
<tr>
<td>Cynoscion complex</td>
<td>16</td>
<td>&lt;0.1</td>
<td>1.0</td>
<td>0.04</td>
</tr>
<tr>
<td>Lutjanus synagris</td>
<td>8</td>
<td>&lt;0.1</td>
<td>0.9</td>
<td>0.02</td>
</tr>
<tr>
<td>Farfantepenaeus duorarum</td>
<td>6</td>
<td>&lt;0.1</td>
<td>1.0</td>
<td>0.02</td>
</tr>
<tr>
<td>Paralichthys dentatus</td>
<td>4</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>0.01</td>
</tr>
<tr>
<td>Pogonias cromis</td>
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<td>&lt;0.1</td>
<td>0.5</td>
<td>0.01</td>
</tr>
<tr>
<td>Menticirrhus saxatilis</td>
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<td>&lt;0.1</td>
<td>0.3</td>
<td>0.01</td>
</tr>
<tr>
<td>Scomberomorus maculatus</td>
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<td>&lt;0.1</td>
<td>0.3</td>
<td>0.01</td>
</tr>
<tr>
<td>Albula vulpes</td>
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<td>0.3</td>
<td>0.01</td>
</tr>
<tr>
<td>Penaeidae sp.</td>
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<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Pomatomus saltatrix</td>
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<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Trachinotus goodei</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>22,486</td>
<td>16.0</td>
<td>.</td>
<td>57.41</td>
</tr>
</tbody>
</table>
Table JX17-04. Catch statistics for 10 dominant taxa collected in 192 183-m haul seine samples during northeast Florida stratified-random sampling, 2017. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td><strong>Mugil cephalus</strong></td>
<td>1,203</td>
<td>20.1</td>
<td>56.8</td>
<td>6.27</td>
<td>1.41</td>
</tr>
<tr>
<td><strong>Eucinostomus harengulus</strong></td>
<td>725</td>
<td>12.1</td>
<td>19.8</td>
<td>3.78</td>
<td>2.08</td>
</tr>
<tr>
<td><strong>Leiostomus xanthurus</strong></td>
<td>493</td>
<td>8.2</td>
<td>29.7</td>
<td>2.57</td>
<td>0.75</td>
</tr>
<tr>
<td><strong>Bairdiella chrysoura</strong></td>
<td>476</td>
<td>8.0</td>
<td>13.5</td>
<td>2.48</td>
<td>1.12</td>
</tr>
<tr>
<td><strong>Lagodon rhomboides</strong></td>
<td>453</td>
<td>7.6</td>
<td>36.5</td>
<td>2.36</td>
<td>0.57</td>
</tr>
<tr>
<td><strong>Litopenaeus setiferus</strong></td>
<td>393</td>
<td>6.6</td>
<td>7.8</td>
<td>2.05</td>
<td>0.93</td>
</tr>
<tr>
<td><strong>Mugil curema</strong></td>
<td>318</td>
<td>5.3</td>
<td>37.5</td>
<td>1.66</td>
<td>0.29</td>
</tr>
<tr>
<td><strong>Diapterus auratus</strong></td>
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<td>5.2</td>
<td>24.0</td>
<td>1.63</td>
<td>0.55</td>
</tr>
<tr>
<td><strong>Eucinostomus gula</strong></td>
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<td>4.7</td>
<td>14.1</td>
<td>1.47</td>
<td>0.55</td>
</tr>
<tr>
<td><strong>Callinectes sapidus</strong></td>
<td>134</td>
<td>2.2</td>
<td>21.9</td>
<td>0.70</td>
<td>0.31</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
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<td>80.0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>5,986</td>
<td>100.0</td>
<td></td>
<td>31.18</td>
<td>4.41</td>
</tr>
</tbody>
</table>
Table JX17-05. Catch statistics for Selected Taxa collected in 192 183-m haul seine samples during northeast Florida stratified-random sampling, 2017. Percent (%) is the percent of the total catch represented by that taxon; percent occurrence (% Occur) is the percentage of samples in which that taxon was collected; CV is the coefficient of variation of the mean. Taxa are ranked in order of decreasing mean catch-per-unit-effort.

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>1,203</td>
<td>20.1</td>
<td>56.8</td>
<td>6.27</td>
<td>1.41</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>493</td>
<td>8.2</td>
<td>29.7</td>
<td>2.57</td>
<td>0.75</td>
</tr>
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<td>7.8</td>
<td>2.05</td>
<td>0.93</td>
</tr>
<tr>
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<td>5.3</td>
<td>37.5</td>
<td>1.66</td>
<td>0.29</td>
</tr>
<tr>
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</tr>
<tr>
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<td>0.53</td>
<td>0.12</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
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<td>14.6</td>
<td>0.41</td>
<td>0.13</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
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<td>1.2</td>
<td>9.9</td>
<td>0.38</td>
<td>0.13</td>
</tr>
<tr>
<td>Elops saurus</td>
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<td>1.2</td>
<td>11.5</td>
<td>0.38</td>
<td>0.11</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>58</td>
<td>1.0</td>
<td>10.9</td>
<td>0.30</td>
<td>0.08</td>
</tr>
<tr>
<td>Paralichthys lethostigma</td>
<td>37</td>
<td>0.6</td>
<td>9.9</td>
<td>0.19</td>
<td>0.07</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
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<td>0.5</td>
<td>9.4</td>
<td>0.16</td>
<td>0.05</td>
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<tr>
<td>Paralichthys albigutta</td>
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<td>6.8</td>
<td>0.08</td>
<td>0.02</td>
</tr>
<tr>
<td>Cynoscion complex</td>
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<td>0.2</td>
<td>2.1</td>
<td>0.05</td>
<td>0.03</td>
</tr>
<tr>
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<td>0.2</td>
<td>2.6</td>
<td>0.05</td>
<td>0.02</td>
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<td>2.6</td>
<td>0.04</td>
<td>0.02</td>
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### Table JX17-05. (Continued).

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>Catch-per-unit-effort (animals/set)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td><strong>Pomatomus saltatrix</strong></td>
<td>7</td>
<td>0.1</td>
<td>3.6</td>
<td>0.04</td>
</tr>
<tr>
<td><strong>Pogonias cromis</strong></td>
<td>7</td>
<td>0.1</td>
<td>2.1</td>
<td>0.04</td>
</tr>
<tr>
<td><strong>Scomberomorus maculatus</strong></td>
<td>7</td>
<td>0.1</td>
<td>2.1</td>
<td>0.04</td>
</tr>
<tr>
<td><strong>Trachinotus falcatus</strong></td>
<td>5</td>
<td>0.1</td>
<td>1.6</td>
<td>0.03</td>
</tr>
<tr>
<td><strong>Farfantepenaeus aztecs</strong></td>
<td>4</td>
<td>0.1</td>
<td>0.5</td>
<td>0.02</td>
</tr>
<tr>
<td><strong>Farfantepenaeus sp.</strong></td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Megalops atlanticus</strong></td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.5</td>
<td>0.01</td>
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<tr>
<td><strong>Rachycentron canadum</strong></td>
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<td>0.5</td>
<td>0.01</td>
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<tr>
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<tr>
<td><strong>Scomberomorus cavalla</strong></td>
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<td>3,068</td>
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<td>15.98</td>
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Table JX17-06. Catch statistics for 10 dominant taxa collected in 588 6.1-m river otter trawl samples during northeast Florida stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>14,767</td>
<td>25.5</td>
<td>61.9</td>
<td>3.53</td>
<td>0.66</td>
</tr>
<tr>
<td>Anchoa mitchilli</td>
<td>14,327</td>
<td>24.7</td>
<td>45.9</td>
<td>3.47</td>
<td>0.74</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>9,330</td>
<td>16.1</td>
<td>48.5</td>
<td>2.12</td>
<td>0.48</td>
</tr>
<tr>
<td>Stellifer lanceolatus</td>
<td>7,395</td>
<td>12.8</td>
<td>9.2</td>
<td>1.74</td>
<td>0.81</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>1,388</td>
<td>2.4</td>
<td>59.7</td>
<td>0.33</td>
<td>0.02</td>
</tr>
<tr>
<td>Anchoa hepsetus</td>
<td>1,420</td>
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<td>6.0</td>
<td>0.32</td>
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</tr>
<tr>
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<td>1.0</td>
<td>0.23</td>
<td>0.22</td>
</tr>
<tr>
<td>Trinectes maculatus</td>
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<td>1.6</td>
<td>35.2</td>
<td>0.22</td>
<td>0.03</td>
</tr>
<tr>
<td>Cynoscion complex</td>
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<td>1.4</td>
<td>21.6</td>
<td>0.20</td>
<td>0.09</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>817</td>
<td>1.4</td>
<td>17.9</td>
<td>0.20</td>
<td>0.07</td>
</tr>
<tr>
<td><strong>Subtotals</strong></td>
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<tr>
<td><strong>Totals</strong></td>
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<td><strong>100.0</strong></td>
<td>.</td>
<td>13.73</td>
<td>1.55</td>
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</table>
Table JX17-07. Catch statistics for Selected Taxa collected in 588 6.1-m river otter trawl samples during northeast Florida stratified-random sampling, 2017. 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>
<thead>
<tr>
<th>Species</th>
<th>Number No.</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m$^2$)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Mean</td>
<td>Stderr</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>14,767</td>
<td>25.5</td>
<td>61.9</td>
<td>3.53</td>
<td>0.66</td>
</tr>
<tr>
<td>Litopenaeus setiferus</td>
<td>9,330</td>
<td>16.1</td>
<td>48.5</td>
<td>2.12</td>
<td>0.48</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>1,388</td>
<td>2.4</td>
<td>59.7</td>
<td>0.33</td>
<td>0.02</td>
</tr>
<tr>
<td>Cynoscion complex</td>
<td>817</td>
<td>1.4</td>
<td>21.6</td>
<td>0.20</td>
<td>0.09</td>
</tr>
<tr>
<td>Leiostomus xanthurus</td>
<td>817</td>
<td>1.4</td>
<td>17.9</td>
<td>0.20</td>
<td>0.07</td>
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<tr>
<td>Farfantepenaeus spp.</td>
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<td>0.02</td>
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<tr>
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<td>0.10</td>
<td>0.02</td>
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<td>Elops saurus</td>
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<td>0.01</td>
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<td>Farfantepenaeus aztecs</td>
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<td>Farfantepenaeus duorarum</td>
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<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
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<td>&lt;0.01</td>
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<td>Paralichthys alboguta</td>
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<td>0.1</td>
<td>4.4</td>
<td>0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Lutjanus griseus</td>
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<td>0.1</td>
<td>3.7</td>
<td>0.01</td>
<td>&lt;0.01</td>
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<tr>
<td>Menippe spp.</td>
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<td>1.2</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Cynoscion nebulosus</td>
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<td>&lt;0.1</td>
<td>1.7</td>
<td>&lt;0.01</td>
<td>&lt;0.01</td>
</tr>
<tr>
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<td>&lt;0.01</td>
<td>&lt;0.01</td>
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</tbody>
</table>
Table JX17-07. (Continued).

<table>
<thead>
<tr>
<th>Species</th>
<th>Number</th>
<th>%</th>
<th>% Occur</th>
<th>Density Estimate (animals/100m²)</th>
<th>Standard Length (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>Mean</td>
<td>Stderr</td>
<td>CV</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
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<td>&lt;0.1</td>
<td>1.2</td>
<td>&lt;0.01</td>
<td>983.24</td>
</tr>
<tr>
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<td>&lt;0.01</td>
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</tr>
<tr>
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<td>1.0</td>
<td>&lt;0.01</td>
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</tr>
<tr>
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<td>0.5</td>
<td>&lt;0.01</td>
<td>1,510.15</td>
</tr>
<tr>
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<td>&lt;0.1</td>
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<td>&lt;0.01</td>
<td>2,424.87</td>
</tr>
<tr>
<td>Lutjanus campechanus</td>
<td>2</td>
<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
<td>2,424.87</td>
</tr>
<tr>
<td>Lutjanus analis</td>
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<td>&lt;0.1</td>
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<td>&lt;0.01</td>
<td>2,424.87</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>1</td>
<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
<td>2,424.87</td>
</tr>
<tr>
<td>Albula vulpes</td>
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<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
<td>2,424.87</td>
</tr>
<tr>
<td>Mugil cephalus</td>
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<td>&lt;0.1</td>
<td>0.2</td>
<td>&lt;0.01</td>
<td>2,424.87</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
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</table>
Appendix JX17-01.  Monthly summary of species collected during northeast Florida stratified-random sampling, 2017.  Effort, or total number of hauls, is labeled ‘E’.  Taxa are arranged alphabetically.

<table>
<thead>
<tr>
<th>Species</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
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<td>11</td>
<td>6</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>9</td>
<td>5</td>
<td>7</td>
<td>6</td>
<td>61</td>
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<tr>
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<td>1</td>
<td>1</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>3</td>
</tr>
<tr>
<td>Alosa mediciorsis</td>
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<td>.</td>
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<td>.</td>
<td>.</td>
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<td>.</td>
<td>.</td>
<td>4</td>
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<td>Alosa sapidissima</td>
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<td>1</td>
<td>.</td>
<td>.</td>
<td>.</td>
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<td>2</td>
<td>1</td>
<td>.</td>
<td>.</td>
<td>5</td>
</tr>
<tr>
<td>Ameiurus catus</td>
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<td>12</td>
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<td>48</td>
<td>71</td>
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<tr>
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<td>.</td>
<td>.</td>
<td>2</td>
<td>4</td>
<td>12</td>
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<tr>
<td>Anchoa hepsetus</td>
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<td>2</td>
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<td>29</td>
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<tr>
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<td>3,645</td>
<td>4,917</td>
<td>1,203</td>
<td>3,535</td>
<td>4,357</td>
<td>5,508</td>
<td>14,580</td>
<td>7,593</td>
<td>12,536</td>
<td>11,643</td>
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<tr>
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</tr>
<tr>
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<tr>
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<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>2</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>3</td>
<td>3</td>
<td>12</td>
<td>6</td>
<td>15</td>
<td>11</td>
<td>1</td>
<td>5</td>
<td>10</td>
<td>3</td>
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Appendix JX-02. Summary by gear and zone of species collected during northeast Florida stratified-random sampling, 2017. Effort, or the total number of hauls, is labeled 'E'. Taxa are arranged alphabetically.

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Fish Health Monitoring

Introduction

Long-term multi-gear and multi-habitat sampling programs, such as the Fisheries-Independent Monitoring (FIM) program, not only provide fish population information to fisheries managers, but also help to document changes and evaluate the effects of natural and anthropogenic disturbances to ecosystems (Wolfe et al. 1987). Increased urban development in coastal areas has made adjacent aquatic ecosystems (estuaries, bays, and tidal rivers) some of the most intensively fertilized environments on earth (Cloern et al. 1995). The influx of nutrients and other materials commonly associated with urban development and industry has led to concerns about the concomitant eutrophication and degradation of water quality in Florida’s coastal systems. Evidence of a correlation between environmental degradation and the occurrence of certain fish diseases continues to accumulate (Sinderman 1979). The incidence of gross external abnormalities (GEAs) in marine species, defined as those illnesses or deformations easily observed in the field, 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 select invertebrates in Florida’s estuaries in April 1998. The main objectives of the fish health monitoring component of the FIM program are to categorize prominent types of GEAs observed, identify which species are most susceptible, and document normal background levels of fish health problems. 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 2017.
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 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 evaluating each specimen, the FWH group assigned a GEA code to each specimen and provided these data to the FIM program for input into a database. 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. Nine Gross External Abnormality (GEA) codes were used:

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

Of the 236,938 fish (≥ 75 mm SL) and selected invertebrates that were collected statewide during 2017 FIM SRS, 2,049 (47 taxa, 0.9%) were observed to have a GEA (Table FH17-01). The northern Indian River Lagoon had specimens with the highest incidence of GEAs (4.5%). Southern Indian River (0.4%), northeast Florida (0.3%), Apalachicola Bay (0.1%), Tampa Bay (0.1%), Charlotte Harbor (<0.1%), and Cedar Key (<0.1%) all had very low incidences of specimens with observed GEAs. Statewide, all nine types of GEAs were observed in 2017. The most often identified GEA was red or bloody areas (B; n=1,051; Table FH17-02) accounting for 51.3% of all GEA’s observed from all estuaries. The next most common GEAs observed were parasitic infestation (P; n=498), other (O; n=209), and erosion or scale loss (E; n=170). Five of the top 11 taxa observed to have a GEA were of recreational or commercial importance (i.e., Selected Taxa). Ariopsis felis (n=982), Mugil curema (n=408), and Mugil cephalus (n=405) were the most common species collected with a GEA. The majority of affected A. felis (n=959) collected were seen to have red or bloody areas (B). The majority of affected M. curema and M. cephalus collected had parasitic infestation (P; n=257 and n=202 respectively). Selected invertebrates that were collected with a GEA during routine monitoring in 2017 included one Menippe spp. in the Northern Indian River that was given a GEA code of other (O) for a “bacterial infection” and a Callinectes sapidus in Charlotte Harbor that was found dead (D) prior to collection.

Incidence by Lab

Apalachicola Bay: Apalachicola Bay staff examined 29,820 specimens for GEAs. Twenty-four individuals (0.1%) from eight taxa, one of which was Selected Taxa, had a GEA (Table FH17-03). Other (O; n=14) was the most common GEA observed and occurred on six taxa.

Cedar Key: Cedar Key staff examined 29,761 specimens for GEAs (Table FH17-04). Only one Strongylura marina (<0.1%) was observed with a GEA of parasitic infestation (P).
Charlotte Harbor: Charlotte Harbor staff examined 55,144 specimens for GEA’s. Twenty-three individuals (<0.1%) from 15 taxa, six of which were Selected Taxa, had a GEA (Table FH17-05).

Northern Indian River Lagoon: Northern Indian River Lagoon staff examined 41,759 specimens for GEAs. One thousand eight hundred eighty individuals (4.5%) from 24 taxa, 10 of which were Selected Taxa, had a GEA (Table FH17-06). Northern Indian River Lagoon had the highest occurrence of specimens with GEAs. Red or bloody areas (B; n=1,043) and parasitic infestation (P; n=445) accounted for 79.1% of the affected specimens within the northern Indian River Lagoon system. Red or bloody areas were primarily observed on A. felis (n=959) and parasitic infestation was primarily observed on M. curema (n=218) and M. cephalus (n=201).

Northeast Florida: Northeast Florida staff examined 12,166 specimens for GEAs. Thirty-two individuals (0.3%) from eight taxa, five of which were Selected Taxa, had a GEA (Table FH17-07). Ulcer or lesion (U; n=31) and skeletal abnormalities (S; n=1) were the only GEAs observed within northeast Florida.

Tampa Bay: Tampa Bay staff examined 53,045 specimens for GEAs. Thirty-one individuals (0.1%) from 11 taxa, two of which were Selected Taxa, had a GEA (Table FH17-08). Other (O; n=17) was the most common GEA observed and comprised 54.8% of the GEAs observed in Tampa Bay. Strongylura notata was the most common taxon with a GEA of other (O; n=14).

Southern Indian River Lagoon: Southern Indian River Lagoon staff examined 15,243 specimens for GEAs. Fifty-seven individuals (0.4%) from eight taxa, five of which were Selected Taxa, had a GEA (Table FH17-09). Parasitic infestation (P; n=40) was the most common GEA observed, accounting for 70.2% of the affected specimens within the southern Indian River Lagoon.
References


Table FH17-01. Incidence of external abnormalities in fish and selected invertebrates collected during stratified-random sampling at each FIM field lab during 2017. 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.

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<td>Cedar Key</td>
<td>29,761</td>
<td>1</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>236,938</strong></td>
<td><strong>2,049</strong></td>
<td><strong>0.9</strong></td>
</tr>
</tbody>
</table>
Table FH17-02. Top 11 taxa having gross external abnormalities, sorted by Percent Affected, collected from all estuaries sampled by the Fisheries-Independent Monitoring program during stratified-random sampling, 2017. 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.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Number Collected (≥ 75-mm SL)</th>
<th>Number Affected (≥ 75-mm SL)</th>
<th>Gross External Abnormality (GEA) Code</th>
<th>Percent Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>P B F U E S T O D</td>
<td></td>
</tr>
<tr>
<td>Ariopsis felis</td>
<td>7,358</td>
<td>982</td>
<td>7 959 5 2 . 1 8 .</td>
<td>13.4</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>4,546</td>
<td>405</td>
<td>202 20 17 12 75 1 . 78 .</td>
<td>8.9</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>7,902</td>
<td>408</td>
<td>257 16 14 7 88 . . 26 .</td>
<td>5.2</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>1,048</td>
<td>38</td>
<td>2 34 . 2 . . . . . . . .</td>
<td>3.6</td>
</tr>
<tr>
<td>Spheeroides nephelus</td>
<td>415</td>
<td>15</td>
<td>. 11 1 . 2 . 1 . . . . . . . . . .</td>
<td>3.6</td>
</tr>
<tr>
<td>Strongylura notata</td>
<td>2,518</td>
<td>76</td>
<td>2 . . 1 . 2 2 69 . . . . . . . .</td>
<td>3.0</td>
</tr>
<tr>
<td>Brevoortia spp.</td>
<td>501</td>
<td>11</td>
<td>5 . . 6 . . . . . . . . . . . . .</td>
<td>2.2</td>
</tr>
<tr>
<td>Chilomycterus schoepfii</td>
<td>812</td>
<td>17</td>
<td>1 3 5 . 4 . . 4 . . . . . . . . .</td>
<td>2.1</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>351</td>
<td>7</td>
<td>1 4 . . . . . . . . . . . . . . .</td>
<td>2.0</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>3,911</td>
<td>7</td>
<td>. 1 . 1 . . . . . 5 . . . . . . .</td>
<td>0.2</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>69,562</td>
<td>9</td>
<td>. 1 1 1 . 5 . 1 . . . . . . . . .</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Subtotals (top 11 taxa with GEAs)</td>
<td>98,924</td>
<td>1,975</td>
<td>477 1,049 43 32 169 9 3 193 0 2</td>
<td></td>
</tr>
<tr>
<td>Totals (all taxa)</td>
<td>236,938</td>
<td>2,049</td>
<td>498 1,051 50 45 170 17 5 209 4</td>
<td>0.9</td>
</tr>
</tbody>
</table>

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 FH17-03. List of taxa, sorted by Percent Affected, having gross external abnormalities collected in Apalachicola Bay during stratified-random sampling, 2017. 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.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Number Collected (≥ 75-mm SL)</th>
<th>Number Affected (≥ 75-mm SL)</th>
<th>Gross External Abnormality (GEA) Code</th>
<th>Percent Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>P B F U E S T O D</td>
<td></td>
</tr>
<tr>
<td><em>Strongylura notata</em></td>
<td>23</td>
<td>3</td>
<td>. . . . . . . 3</td>
<td>13.0</td>
</tr>
<tr>
<td><em>Ictalurus punctatus</em></td>
<td>127</td>
<td>6</td>
<td>3 . . . . . 3</td>
<td>4.7</td>
</tr>
<tr>
<td><em>Ictalurus furcatus</em></td>
<td>143</td>
<td>6</td>
<td>3 . . 1 . . . 2</td>
<td>4.2</td>
</tr>
<tr>
<td><em>Chilomycterus schoepfii</em></td>
<td>67</td>
<td>1</td>
<td>. . . . . . . 1</td>
<td>1.5</td>
</tr>
<tr>
<td><em>Strongylura marina</em></td>
<td>335</td>
<td>4</td>
<td>. . . . . . . 4</td>
<td>1.2</td>
</tr>
<tr>
<td><em>Ariopsis felis</em></td>
<td>706</td>
<td>1</td>
<td>1 . . . . . . . . . . . . . . . . . .</td>
<td>0.1</td>
</tr>
<tr>
<td><em>Leiostomus xanthurus</em></td>
<td>2,109</td>
<td>1</td>
<td>1 . . . . . . . . . . . . . . . . . .</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td><em>Lagodon rhomboides</em></td>
<td>10,188</td>
<td>2</td>
<td>. . . . . . . 1 . 1 . . . . . . . . .</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td><strong>Totals (all taxa)</strong></td>
<td><strong>29,820</strong></td>
<td><strong>24</strong></td>
<td><strong>8 . . 1 . 1 . 14 . . . . . . . . .</strong></td>
<td><strong>0.1</strong></td>
</tr>
</tbody>
</table>

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 FH17-04. List of taxa, sorted by Percent Affected, having gross external abnormalities collected in Cedar Key during stratified-random sampling, 2017. 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.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Number Collected (≥ 75-mm SL)</th>
<th>Number Affected (≥ 75-mm SL)</th>
<th>Gross External Abnormality (GEA) Code</th>
<th>Percent Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>P</td>
<td>B</td>
</tr>
<tr>
<td>Strongylura marina</td>
<td>72</td>
<td>1</td>
<td>1</td>
<td>.</td>
</tr>
<tr>
<td>Totals (all taxa)</td>
<td>29,761</td>
<td>1</td>
<td>1</td>
<td>.</td>
</tr>
</tbody>
</table>

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 FH17-05. List of taxa, sorted by Percent Affected, having gross external abnormalities collected in Charlotte Harbor during stratified-random sampling, 2017. 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.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Number Collected (≥ 75-mm SL)</th>
<th>Number Affected (≥ 75-mm SL)</th>
<th>Gross External Abnormality (GEA) Code</th>
<th>Percent Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ancylopsetta quadrocellata</td>
<td>6</td>
<td>1</td>
<td>P . . F U E S T O D</td>
<td>16.7</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>75</td>
<td>1</td>
<td>P . . F U E S T O D</td>
<td>1.3</td>
</tr>
<tr>
<td>Harengula jaguana</td>
<td>94</td>
<td>1</td>
<td>P . . F U E S T O D</td>
<td>1.1</td>
</tr>
<tr>
<td>Strongylura marina</td>
<td>103</td>
<td>1</td>
<td>P . . F U E S T O D</td>
<td>1.0</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>117</td>
<td>1</td>
<td>P . . F U E S T O D</td>
<td>0.9</td>
</tr>
<tr>
<td>Bairdiella chrysoura</td>
<td>389</td>
<td>3</td>
<td>P . . F U E S T O D</td>
<td>0.8</td>
</tr>
<tr>
<td>Mugil trichodon</td>
<td>166</td>
<td>1</td>
<td>P . . F U E S T O D</td>
<td>0.6</td>
</tr>
<tr>
<td>Chilomycterus schoepfii</td>
<td>569</td>
<td>3</td>
<td>P . . F U E S T O D</td>
<td>0.5</td>
</tr>
<tr>
<td>Opsanus beta</td>
<td>252</td>
<td>1</td>
<td>P . . F U E S T O D</td>
<td>0.4</td>
</tr>
<tr>
<td>Strongylura notata</td>
<td>1,087</td>
<td>2</td>
<td>P . . F U E S T O D</td>
<td>0.2</td>
</tr>
<tr>
<td>Callinectes sapidus</td>
<td>615</td>
<td>1</td>
<td>P . . F U E S T O D</td>
<td>0.2</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>839</td>
<td>1</td>
<td>P . . F U E S T O D</td>
<td>0.1</td>
</tr>
<tr>
<td>Centropomus undecimalis</td>
<td>1,857</td>
<td>2</td>
<td>P . . F U E S T O D</td>
<td>0.1</td>
</tr>
<tr>
<td>Ariopsis felis</td>
<td>1,135</td>
<td>1</td>
<td>P . . F U E S T O D</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>31,884</td>
<td>3</td>
<td>P . . F U E S T O D</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td><strong>Totals (all taxa)</strong></td>
<td><strong>55,144</strong></td>
<td><strong>23</strong></td>
<td><strong>P . . F U E S T O D</strong></td>
<td><strong>&lt;0.1</strong></td>
</tr>
</tbody>
</table>

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 FH17-06. List of taxa, sorted by Percent Affected, having gross external abnormalities collected in northern Indian River Lagoon during stratified-random sampling, 2017. 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.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Number Collected (≥ 75-mm SL)</th>
<th>Number Affected (≥ 75-mm SL)</th>
<th>Gross External Abnormality (GEA) Code</th>
<th>Percent Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>P B F U E S T O D</td>
<td></td>
</tr>
<tr>
<td>Menippe spp.</td>
<td>3</td>
<td>1</td>
<td>. . . . . . . 1</td>
<td>33.3</td>
</tr>
<tr>
<td>Ariopsis felis</td>
<td>4,523</td>
<td>979</td>
<td>6 959 5 . . 1 8</td>
<td>21.6</td>
</tr>
<tr>
<td>Strongylura notata</td>
<td>259</td>
<td>55</td>
<td>2 . . . . 2 51</td>
<td>21.2</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>2,503</td>
<td>388</td>
<td>201 17 16 . 75 1 . 78</td>
<td>15.5</td>
</tr>
<tr>
<td>Pomatomus saltatrix</td>
<td>10</td>
<td>1</td>
<td>1 . . . . . . . .</td>
<td>10.0</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>21</td>
<td>2</td>
<td>2 . . . . . . . .</td>
<td>9.5</td>
</tr>
<tr>
<td>Chilomycterus schoepfii</td>
<td>176</td>
<td>13</td>
<td>1 3 2 . 4 . 3</td>
<td>7.4</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>5,318</td>
<td>355</td>
<td>218 12 12 . 88 . 25</td>
<td>6.7</td>
</tr>
<tr>
<td>Micropterus salmoides</td>
<td>15</td>
<td>1</td>
<td>. . . . . . 1</td>
<td>6.7</td>
</tr>
<tr>
<td>Caranx hippos</td>
<td>123</td>
<td>5</td>
<td>3 1 . . 1 . . . .</td>
<td>4.1</td>
</tr>
<tr>
<td>Mugil rubrioculus</td>
<td>52</td>
<td>2</td>
<td>1 . . . . . 1</td>
<td>3.9</td>
</tr>
<tr>
<td>Pogonias cromis</td>
<td>1,048</td>
<td>38</td>
<td>2 34 . 2 . . . .</td>
<td>3.6</td>
</tr>
<tr>
<td>Sphoeroides nebelhus</td>
<td>415</td>
<td>15</td>
<td>. 11 1 . 2 . 1 . .</td>
<td>3.6</td>
</tr>
<tr>
<td>Sciaenops ocellatus</td>
<td>234</td>
<td>6</td>
<td>1 4 . . . . 1</td>
<td>2.6</td>
</tr>
<tr>
<td>Sphoeroides testudineus</td>
<td>104</td>
<td>1</td>
<td>. . . . . . 1</td>
<td>1.0</td>
</tr>
<tr>
<td>Menticirrhus americanus</td>
<td>431</td>
<td>3</td>
<td>1 . 2 . . . . . . . .</td>
<td>0.7</td>
</tr>
<tr>
<td>Chaetodipterus faber</td>
<td>149</td>
<td>1</td>
<td>. . . . . . 1</td>
<td>0.7</td>
</tr>
<tr>
<td>Brevoortia spp.</td>
<td>327</td>
<td>2</td>
<td>2 . . . . . . . . .</td>
<td>0.6</td>
</tr>
</tbody>
</table>
Table FH17-06. (Continued).

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Number Collected (≥ 75-mm SL)</th>
<th>Number Affected (≥ 75-mm SL)</th>
<th>Gross External Abnormality (GEA) Code</th>
<th>Percent Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elops saurus</td>
<td>553</td>
<td>3</td>
<td>P</td>
<td>0.5</td>
</tr>
<tr>
<td>Oligoplites saurus</td>
<td>323</td>
<td>1</td>
<td>B</td>
<td>0.3</td>
</tr>
<tr>
<td>Dasyatis sabina</td>
<td>1,061</td>
<td>3</td>
<td>F</td>
<td>0.3</td>
</tr>
<tr>
<td>Lagodon rhomboides</td>
<td>2,180</td>
<td>3</td>
<td>U</td>
<td>0.1</td>
</tr>
<tr>
<td>Eucinostomus gula</td>
<td>1,101</td>
<td>1</td>
<td>E</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Diapterus auratus</td>
<td>7,228</td>
<td>1</td>
<td>S</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Totals (all taxa)</td>
<td>41,759</td>
<td>1,880</td>
<td>445</td>
<td>4.5</td>
</tr>
</tbody>
</table>

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 FH17-07. List of taxa, sorted by Percent Affected, having gross external abnormalities collected in northeast Florida during stratified-random sampling, 2017. 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.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Number Collected (≥ 75-mm SL)</th>
<th>Number Affected (≥ 75-mm SL)</th>
<th>Gross External Abnormality (GEA) Code</th>
<th>Percent Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>P  B  F  U  E  S  T  O  D</td>
<td></td>
</tr>
<tr>
<td>Alosa mediocris</td>
<td>1</td>
<td>1</td>
<td>..  ..  ..  1  ..  ..  ..  ..</td>
<td>100.0</td>
</tr>
<tr>
<td>Brevoortia spp.</td>
<td>122</td>
<td>6</td>
<td>..  ..  ..  6  ..  ..  ..  ..</td>
<td>4.9</td>
</tr>
<tr>
<td>Mugil curema</td>
<td>469</td>
<td>7</td>
<td>..  ..  ..  7  ..  ..  ..  ..</td>
<td>1.5</td>
</tr>
<tr>
<td>Archosargus probatocephalus</td>
<td>70</td>
<td>1</td>
<td>..  ..  ..  ..  1  ..  ..  ..</td>
<td>1.4</td>
</tr>
<tr>
<td>Cynoscion complex</td>
<td>165</td>
<td>2</td>
<td>..  ..  ..  2  ..  ..  ..  ..</td>
<td>1.2</td>
</tr>
<tr>
<td>Mugil cephalus</td>
<td>1,445</td>
<td>11</td>
<td>..  ..  ..  11  ..  ..  ..  ..</td>
<td>0.8</td>
</tr>
<tr>
<td>Bairdiella chrysoura</td>
<td>658</td>
<td>3</td>
<td>..  ..  ..  3  ..  ..  ..  ..</td>
<td>0.5</td>
</tr>
<tr>
<td>Micropogonias undulatus</td>
<td>1,321</td>
<td>1</td>
<td>..  ..  ..  1  ..  ..  ..  ..</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Totals (all taxa)</td>
<td>12,166</td>
<td>32</td>
<td>..  ..  ..  31  ..  ..  ..  ..</td>
<td>0.3</td>
</tr>
</tbody>
</table>

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.
List of taxa, sorted by Percent Affected, having gross external abnormalities collected in Tampa Bay during stratified-random sampling, 2017. 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.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Number Collected</th>
<th>Number Affected</th>
<th>Gross External Abnormality (GEA) Code ¹</th>
<th>Percent Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(≥ 75-mm SL)</td>
<td>(≥ 75-mm SL)</td>
<td>P</td>
<td>B</td>
</tr>
<tr>
<td>Loricariidae spp.</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pterygoplichthys disjunctivus</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tylosurus crocodilus</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brevoortia spp.²</td>
<td>52</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dasyatis say</td>
<td>31</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongylura notata</td>
<td>1,094</td>
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<tr>
<td>Eugerres plumieri</td>
<td>287</td>
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</tr>
<tr>
<td>Centropomus undecimalis</td>
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<td>Caranx hippos</td>
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<td></td>
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<tr>
<td>Totals (all taxa)</td>
<td>53,045</td>
<td>31</td>
<td>4</td>
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</tr>
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</table>

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.

² Not all parasitized individuals for Brevoortia spp. were identified in some collections because of high numbers and/or parasite escapement. Therefore, the number of parasitized individuals in the table represent an under-estimate for this taxon.
Table FH17-09. List of taxa, sorted by Percent Affected, having gross external abnormalities collected in southern Indian River Lagoon during stratified-random sampling, 2017. Number collected = total number of each species collected. Number affected = total number of individuals with abnormalities by health code. Percent affected = (number affected / number collected) * 100. Taxa in bold font are recreationally or commercially important (selected taxa).

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Number Collected (≥ 75-mm SL)</th>
<th>Number Affected (≥ 75-mm SL)</th>
<th>Gross External Abnormality (GEA) Code</th>
<th>Percent Affected</th>
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<td>P B F U E S T O D</td>
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<td>Oreochromis spp.</td>
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<td>Mugil cephalus</td>
<td>598</td>
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<td>1 3 1 1 . . . . .</td>
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<td>Lutjanus griseus</td>
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<td>Archosargus probatocephalus</td>
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<td>40 7 4 3 . . . 2 1</td>
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</table>

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.
Species Profiles

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. This section provides profiles of target species that are routinely collected in FIM program sampling and are of recreational or commercial importance in Florida (e.g., Red Drum, Spotted Seatrout, Sheepshead, Striped Mullet, Pinfish, Common Snook, and Blue Crab).

Similar analyses were used to develop recruitment indices for each species examined. Data from stratified-random sampling (SRS) were used to create IOAs for YOY and adults of target species. Starting 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 or years of available data, and separate IOAs were calculated for each study area. The specific time periods and sizes of specimens included in the analyses varied among species based upon their individual patterns of recruitment and growth. In general, for each species, only months of peak abundance were included in the 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 to create IOAs. This report represents a data summary and not an in-depth analysis of factors affecting abundance, therefore, year was the only factor retained in the model runs for the 2017 FIM Annual Report Species Profiles. All IOAs were completed by using the GLIMMIX procedure (SAS Institute Inc. 2006).

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 (μ=0, σ=1) and adding it to the least-squares mean. These data were then back-transformed (e^x). The process was repeated 500 times for each year to create a sampling distribution of back-transformed values and summary statistics (25 and 75 percentiles) were then calculated and plotted to view annual trends in IOAs (Sokal and Rohlf 1981).
References


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Red Drum, *Sciaenops ocellatus*

The Red Drum, *Sciaenops ocellatus*, is an estuarine-dependent species inhabiting coastal waters from Massachusetts to northern Mexico (Yokel 1966; Reagan 1985). This species supports important recreational fisheries throughout the U.S. South Atlantic and Gulf of Mexico coasts. In Florida, dramatic stock reductions in the mid-1980s resulted in a 1986 moratorium on commercial and recreational Red Drum fisheries. In 1989, the fishery was reopened with strict size and bag limits, as well as a no-sale provision that effectively eliminated the commercial Red Drum fishery in Florida. Since that time, Red Drum stocks have recovered significantly. In a 2015 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 management target of at least a 40% escapement rate on both coasts, and Red Drum populations in all four statewide assessment regions are neither considered overfished nor undergoing overfishing (Chagaris et al. 2015). In addition, continued improvement of escapement rates within the northeast and northwest management regions of the state led to an increase of the daily bag limit from one to two fish in early 2012. However, in 2016, after stakeholder input, the bag limit in the northwest management region was reduced back to 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.

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 (Bachelor 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 inch 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 six Florida estuaries: Apalachicola Bay, Cedar Key, Tampa Bay, Charlotte Harbor, northeast Florida, and the northern IRL. Young-of-the-year Red Drum recruited to habitats sampled with FIM 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 IOA for 2017 therefore only included data from September through December 2017. 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. 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).

Indices of abundance for YOY Red Drum varied annually without trend on Florida’s northwest coast (Figure SP17-01). The IOAs for YOY Red Drum in Apalachicola Bay indicated strong year classes in 1998 and 2002; otherwise recruitment was relatively low, but stable. The IOAs for legal-size Red Drum in Apalachicola Bay have been relatively stable over the time series with peaks in abundance in 2003, 2007 – 2009, and 2012 – 2013. Young-of-the-year IOAs in Cedar Key riverine habitats indicated a relatively strong year class in 1997; otherwise, YOY Red Drum IOAs remained fairly low and stable. In Cedar Key bay habitats, YOY IOAs were low and without trend with the catch rates slightly
above zero in this habitat during most years, except for peaks in abundance in 2003, 2013, and 2017. The IOAs for legal-size Red Drum in Cedar Key showed peak abundances during 1999 – 2001. Starting in 2002 through the present, abundance of legal-size Red Drum have been stable, but relatively low.

Annual IOAs for YOY Red Drum in Tampa Bay riverine habitats peaked during 2003 and 2004, but otherwise have been relatively stable over the time series (Figure SP17-02). In bay habitats, annual IOAs for YOY Red Drum were relatively stable in Tampa Bay from 1996 through 2012 with an increasing trend starting in 2013 through the present. Annual IOAs for legal-size fish in Tampa Bay have varied without trend. The IOAs for YOY Red Drum in Charlotte Harbor riverine habitats have been relatively low, but stable since 1996 with peaks in abundance during 2002 – 2003 and with smaller increases in 2010 and 2014 – 2015. In Charlotte Harbor bay habitats, annual IOAs for YOY Red Drum have been relatively stable since 1996 with only one strong year class evident in 2013. Abundance of legal-size fish in Charlotte Harbor has varied since 1996 with the highest abundances occurring in 1998, 2003, 2007, and 2013.

Red Drum IOAs varied substantially between estuaries on Florida’s Atlantic coast (Figure SP17-03). Indices of abundance for YOY Red Drum in northeast Florida estuaries varied without trend from 2001 through 2017 with stronger year classes in 2003 and 2012. Annual IOAs for legal-size Red Drum in Northeast Florida show a consistent low level of abundance except for a period of increased abundance from 2004 through 2006. In the northern IRL, recruitment of YOY Red Drum has varied without trend with several peak years observed (2000, 2004, 2006 – 2008, 2013, and 2017) in riverine habitats and a strong year class in 2015 in bay habitats. Annual IOAs for legal-size Red Drum in the northern and southern IRL have both varied without trend. Abundance of legal-sized Red Drum was typically higher each year in the NIRL than in the SIRL.

Length-frequency data for Red Drum that were collected with 183-m haul seines provides valuable information on larger juveniles and adults (Figures SP17-04, SP17-05). In most estuaries, there were multiple size classes observed in the length-frequency distributions with one mode between ~100 – 200 mm SL (large YOY), a second mode from ~300 – 400 mm SL (age-1), and a third from ~450 – 600 mm SL (age-2 – 3). In Tampa Bay, Charlotte Harbor (Figure SP17-04), and the northern IRL (Figure SP17-05),
abundances of individuals within the legal slot-limit were roughly equivalent to the abundance of individuals approaching the minimum slot-limit length. In contrast, in Apalachicola Bay, Cedar Key (Figure SP17-04), northeast Florida, and the southern IRL (Figure SP17-05), the abundances of Red Drum within the legal slot-limit dropped off sharply from the abundances of individuals approaching the legal harvestable size range. Legal-size Red Drum were likely age-2 and age-3 individuals, and the length-frequency distributions dropped off sharply in all estuaries examined after the upper slot limit. This may have been due to the fact that older Red Drum (age-4 and older), once sexually mature, typically leave the estuaries and move to coastal areas to join schools of other reproductively mature individuals and become unavailable to routine FIM sampling gears.
References


Apalachicola Bay

Red Drum (≤ 40 mm) Bay Sets

Red Drum (Legal Size)

Number per Set
(183-m Haul Seines)
0.0
0.5
1.0
1.5
2.0


Cedar Key

Red Drum (≤ 40 mm) River Sets

Red Drum (≤ 40 mm) Bay Sets

Red Drum (Legal Size)

Number per Set
(183-m Haul Seines)
0.0
0.5
1.0
1.5
2.0


Figure SP17-01. Relative abundance of young-of-the-year Red Drum (≤ 40 mm SL) collected in 21.3-m seines and of legal-size Red Drum (374-565 mm SL) collected in 183-m haul seines between 1996 and 2017 during stratified-random sampling from Apalachicola Bay and Cedar Key. In Cedar Key, where sufficient numbers of individuals were captured, separate plots for river and bay sets were created to examine differences in YOY recruitment between the two habitats. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gears and estuaries.
Figure SP17-02. Relative abundance of young-of-the-year Red Drum (≤ 40 mm SL) collected in 21.3-m seines and of legal-size Red Drum (374-565 mm SL) collected in 183-m haul seines between 1996 and 2017 during stratified-random sampling from Tampa Bay and Charlotte Harbor. Separate plots for river and bay sets were created to examine differences in YOY recruitment between the two habitats. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gears and estuaries.
Figure SP17-03. Relative abundance of young-of-the-year Red Drum (≤ 40 mm SL) collected in 21.3-m seines and of legal-size Red Drum (374-565 mm SL) collected in 183-m haul seines between 1996 and 2017 during stratified-random sampling from Northeast Florida and Indian River Lagoon. In the northern Indian River Lagoon, where sufficient numbers of individuals were captured, separate plots for river and bay sets were created to examine differences in YOY recruitment between the two habitats. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gears and estuaries. 

SP-13
Figure SP17-04. Length frequency diagrams of Red Drum collected in 183-m haul seines from four Florida Gulf coast estuarine systems. Area between dashed lines (---) indicates permitted recreational harvest size range (374-565 mm SL). All lengths are standard length (SL). Note different scales and years of collection among plots.
Figure SP17-05. Length frequency diagrams of Red Drum collected in 183-m haul seines from three Florida Atlantic coast estuarine systems. Area between dashed lines (- - -) indicates permitted recreational harvest size range (374-565 mm SL). All lengths are standard length (SL). Note different scales and years of collection among plots.
Spotted Seatrout, *Cynoscion nebulosus*

Spotted Seatrout, *Cynoscion nebulosus*, occur in temperate to tropical estuarine and coastal waters on the Atlantic and Gulf of Mexico (Gulf) coasts of the United States (Bortone 2003). In Florida, Spotted Seatrout have historically supported economically-important recreational and commercial fisheries. Overall, annual commercial landings of Spotted Seatrout in Florida declined quite slowly during the period 1950 through the 1970s. During the 1980s, the decline accelerated, especially in the Southwest region (Murphy et al. 2011). Statewide commercial landings never exceeded much more than 500,000 fish during the early 1990s and dropped drastically to fewer than 50,000 fish after implementation of the constitutional amendment banning the use of entangling gear in 1995 and the establishment of a 3-month open season in 1996 (Murphy et al. 2011). 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). Commercial effort levels continue to be significantly less than the recreational sector (Murphy et al. 2011). Since the mid-1990s various commercial and recreational fishing regulations have been adopted in an effort to support the rebuilding of Spotted Seatrout stocks (Murphy et al. 1999). With these regulatory changes, the Spotted Seatrout fishery has moved from a mixed-sector fishery, with about 20% of the landings made by commercial fishers, to an almost exclusive recreational fishery (Chagaris et al. 2008). In 2011, the National Marine Fisheries Service reported the total estimated recreational landings for this species in Florida were 1,793,472 fish.

Adult Spotted Seatrout begin to spawn in March or April in southwest and west-central Florida estuaries (i.e., Tampa Bay and Charlotte Harbor; McMichael and Peters 1989) and in April or May in the more northerly Florida estuaries (i.e., northern Indian River Lagoon (IRL): Tabb 1961, Crabtree and Adams 1998; Cedar Key: Moody 1950; and Apalachicola Bay: Devries et al. 2002). Spotted Seatrout are generally reproductively mature at age 2 (males > 200 mm standard length [SL]; females > 235 mm SL; Murphy et al. 2006). Protracted spawning of Spotted Seatrout continues throughout the summer and into late September or October, depending upon location (Murphy et al. 1999). Spawning generally occurs during the evening hours in deep channels and depressions.
near grass flats in estuarine areas with water temperatures \(> 21^\circ C\) (Tabb 1966; Helser et al. 1993). Estuarine water temperatures below \(20^\circ C\) 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 (YOO) Spotted Seatrout recruitment into selected Florida estuaries. Abundance data for YOY Spotted Seatrout \((\leq 100 \text{ mm SL})\) collected from stratified-random 21.3-m seine samples were examined to assess recruitment in six Florida estuaries: (in order of inception) Tampa Bay, Charlotte Harbor, northern IRL, Cedar Key, Apalachicola Bay, and northeast Florida. Young-of-the-year Spotted Seatrout recruited to habitats sampled with 21.3-m seines primarily from April through October in Tampa Bay and Charlotte Harbor, and from May through November in the northern IRL, northeast Florida, and Cedar Key. In Apalachicola Bay, recruitment of YOY Spotted Seatrout was evident from June through October. These recruitment periods coincide with published recruitment and spawning periods of Spotted Seatrout throughout Florida (Moody 1950; Nelson and Leffler 2001; Devries et al. 2002; Walters et al. 2007). Therefore, these bay-specific months were used to define the respective recruitment seasons for each estuary in subsequent analyses. Indices 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 \((\geq 200 \text{ mm SL})\). These IOAs were derived by including all Spotted Seatrout \(\geq 200 \text{ mm SL}\) collected between January and December from 1996 through 2017.

Indices of abundance for YOY Spotted Seatrout on Florida’s northwest coast have been variable, but relatively stable since 1996 (Figure SP17-06). The IOAs of YOY Spotted Seatrout in Apalachicola Bay varied without trend with relatively stronger year classes in 1998, 2006, 2009, 2010, and 2015 (Figure SP17-06). In Cedar Key, strong year classes were evident in riverine habitats during 1997 – 1998 and 2002 and have otherwise remained relatively stable at lower abundances. In Cedar Key bay habitats, strong year classes of YOY Spotted Seatrout were evident from 1996 – 1998 and have since remained low, but stable through 2017. The IOAs for adult Spotted Seatrout in
Apalachicola Bay indicated a stable population, with very high abundance in 2010. In Cedar Key, a strong year class was observed in adult Spotted Seatrout in 1998 and subsequent abundances were stable, but low through 2017 (Figure SP17-06).

Trends in relative abundance of YOY Spotted Seatrout in Tampa Bay have remained relatively stable since the mid-1990s, but exhibited an overall downward trend (Figure SP17-07). With the exception of strong year classes in 1996, 1997, 1999, and 2004, recruitment of YOY Spotted Seatrout in riverine habitats has been stable, but low. In bay habitats, peaks in abundance of YOY Spotted Seatrout were observed periodically between 1996 and 2004; a noticeably lower, but stable trend was observed from 2005 through 2017. Abundance of YOY Spotted Seatrout in Charlotte Harbor riverine habitats has remained stable since 1996, with one strong year class in 1998. In Charlotte Harbor bay habitats, YOY abundance has remained stable after strong year classes in 1996 and 1997 (Figure SP17-07). For both Tampa Bay and Charlotte Harbor, considerably higher abundance was observed for YOY Spotted Seatrout for bay habitats in comparison to riverine habitats (Figure SP17-07). Patterns of relative abundance for adult Spotted Seatrout in Tampa Bay and Charlotte Harbor have been variable, but relatively stable since 1996 (Figure SP17-07). Periods of greater abundance occurred in 1999, 2003 – 2004, 2008, 2010 – 2011, 2014 and 2016 in Tampa Bay, and in 2002 in Charlotte Harbor. Overall, adult catches in these systems were low (< 1 fish/set) and as such, the magnitude of peaks in abundance was small as well.

Trends in YOY Spotted Seatrout abundance on Florida’s Atlantic coast have been relatively stable with periodic small fluctuations in recruitment (Figure SP17-08). In northeast Florida, IOAs for YOY Spotted Seatrout varied without trend, with peaks in 2007 and 2011. In the northern Indian River Lagoon, abundance indices for YOY Spotted Seatrout have remained relatively stable with peaks in abundance in 1996, 2005, and 2015. Indices of abundance for adult Spotted Seatrout in northeast Florida were relatively stable from 2001 – 2012, with a noticeable decrease in 2004 and decreased abundance since 2013 (Figure SP17-08). Adult Spotted Seatrout indices in the northern Indian River Lagoon have generally fluctuated without trend with the exception of increased abundance in 2010 – 2011 and 2016. In the southern Indian River Lagoon, relative abundance of adult Spotted Seatrout has remained extremely low, but stable since 1997.
The 183-m haul seine provides valuable length-frequency data on sub-adult and adult Spotted Seatrout ≥ 100 mm SL (Figure SP17-09 and SP17-10). Three distinct peaks in length-frequency were evident from the 183-m haul seine data collected within the Gulf coast estuaries. Two peaks were shared by all Gulf coast estuaries. The larger peak primarily consisted of fish ~150 mm SL, while the smaller peak consisted of adults ~300 mm SL. In Apalachicola Bay, an additional third peak in length-frequency occurred at ~220 mm SL. The size distributions of Spotted Seatrout collected with 183-m haul seines in the Atlantic coast estuaries indicated two distinct peaks in northeast Florida (~150 and ~250 mm SL), a unimodal distribution in the northern Indian River Lagoon (peak from 125-250mm SL) and a more sporadic distribution in the southern Indian River Lagoon. In all sampling areas except for the southern Indian River Lagoon, abundance dropped off sharply as the permitted recreational harvest size (325 mm SL) was reached.
References


Figure SP17-06. Relative abundance of young-of-the-year Spotted Seatrout ($\leq 100$ mm SL) collected in 21.3-m seines and of reproductively mature Spotted Seatrout ($\geq 200$ mm SL) collected in 183-m haul seines between 1996 and 2017 during stratified-random sampling of Apalachicola Bay and Cedar Key. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales in some cases for estimates from 21.3-m and 183-m seines.
Relative abundance of young-of-the-year Spotted Seatrout (≤ 100 mm SL) collected in 21.3-m seines and of reproductively mature Spotted Seatrout (≥ 200 mm SL) collected in 183-m haul seines between 1996 and 2017 during stratified-random sampling from Tampa Bay and Charlotte Harbor. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales in some cases for estimates from 21.3-m and 183-m seines.
Relative abundance of young-of-the-year Spotted Seatrout ($\leq 100$ mm SL) collected in 21.3-m seines and of reproductively mature Spotted Seatrout ($\geq 200$ mm SL) collected in 183-m haul seines between 1996 and 2017 during stratified-random sampling from Northeast Florida and the Indian River Lagoon. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales in some cases for estimates from 21.3-m and 183-m seines.
Length frequency diagrams of Spotted Seatrout collected in 183-m haul seines from four Florida Gulf coast estuarine systems. Area between dashed lines (-----) indicates permitted recreational harvest size range (325 – 434 mm SL). Current Florida regulations allow anglers to keep one fish greater than the maximum slot limit size. All lengths are standard length (SL). Note different scales and years of collection among plots.
Length frequency diagrams of Spotted Seatrout collected in 183-m haul seines from three Florida Atlantic coast estuarine systems. Area between dashed lines (-----) indicates permitted recreational harvest size range (325 – 434 mm SL). Current Florida regulations allow anglers to keep one fish greater than the maximum slot limit size. All lengths are standard length (SL). Note different scales and years of collection among plots.

Figure SP17-10.
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 (15 fish/day). The most recent stock assessment for Sheepshead used Fisheries-Independent Monitoring (FIM) program data to derive annual indices of abundance (IOAs) during different life history stages to guide coast-specific catch-at-age models (Munyandorero et al. 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. Regressions 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 268 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. Abundance data for YOY (<40 mm SL) collected in stratified-random 21.3-m seines were examined to assess recruitment in three Florida estuaries: (in order of FIM program inception) Tampa Bay, Charlotte Harbor, and the northern Indian River Lagoon (IRL). This life history stage was not examined for Apalachicola Bay, Cedar Key, or northeast Florida due to small sample sizes. Indices of abundance of YOY Sheepshead were not calculated for southern IRL where 21.3-m seines were not included as a sampling gear. Young-of-the-year Sheepshead recruited to habitats sampled with 21.3-m seines primarily from April through June. These months
were used to define the respective recruitment seasons for each estuary in subsequent analyses. Abundance indices were also calculated for Sheepshead fully recruited to the fishery (≥242 mm SL) for seven Florida estuarine areas: Tampa Bay, Charlotte Harbor, northern Indian River Lagoon, southern Indian River Lagoon, Cedar Key, Apalachicola Bay, and northeast Florida. Data from stratified-random 183-m haul seines were used to develop IOAs for fully-recruited Sheepshead from January through December of each year.

Annual IOAs were only calculated for fully-recruited Sheepshead in the two northwest Florida estuaries of Apalachicola Bay and Cedar Key (Figure SP17-11). Annual IOAs for fully-recruited Sheepshead in Apalachicola Bay were relatively low in 1998 and 1999, then increased through 2001 and remained relatively consistent through 2008, decreased slightly in 2009 and has remained at similar levels through 2017. Abundance of fully-recruited Sheepshead in Cedar Key exhibited a slight decreasing trend from 1997 through 2005, and have remained relatively consistent since; however, the lowest abundance levels observed since 1997 occurred in 2017.


Abundance estimates for fully recruited Sheepshead in northeast Florida increased from 2001–2004, followed by a decrease through 2006 and have remained relatively stable since; however, in 2016 and 2017 there was the lowest sheepshead abundance in the past 17 years (Figure SP17-13). Young-of-the-year IOAs for northern
IRL riverine habitats were quite variable with strong year classes evident in 2001 and 2004. Extremely low abundances were seen in 1999, 2002, 2003, and 2014 through 2017 (Figure SP17-13). Young-of-the-year IOAs in northern IRL bay habitats were stable at low abundances from 1998-2017 with slight peaks in abundance occurring in 2004 and 2007. Annual IOAs of fully-recruited Sheepshead in the southern IRL have been relatively stable between 1997 and 2017, with slight peaks from 1998 through 2000. Northern IRL IOAs of fully-recruited Sheepshead were lower than the Southern IRL. Abundance estimates were relatively stable at low abundances from 1997–2016, with the lowest abundance of the past 21 years in 2017.

Length-frequency data collected with 183-m haul seines provides valuable information on multiple life stages of Sheepshead (Figure SP17-14 and SP17-15). Length frequency data generally indicated multiple cohorts captured with the 183-m seines. The smallest cohort captured with this gear included late YOY Sheepshead ranging from 60–100 mm. The presence of these juvenile Sheepshead in the catch was more prevalent in Tampa Bay, Charlotte Harbor, and the Northern Indian River Lagoon. Similarly, pre-fishery sized Sheepshead (100–200 mm SL) were most prevalent in Tampa Bay, Charlotte Harbor, and the Northern Indian River Lagoon. The ‘fully-recruited’ mode (cohort) was generally shifted to the right in the northern Florida estuaries (~325 mm SL; Apalachicola Bay, Cedar Key, and northeast Florida) and was slightly smaller in the southern Florida estuaries (~250 mm SL, Tampa Bay, Charlotte Harbor, and southern IRL). Modal peaks in length frequencies did not appear to be severely truncated above the legal minimum size.
References


Figure SP17-11. Relative abundance of fully-recruited Sheepshead (≥ 268 mm SL) collected in 183-m haul seines between 1997 and 2017 during stratified-random sampling in the Apalachicola and Cedar Key estuarine systems. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different estuaries.
Figure SP17-12. Relative abundance of young-of-the-year Sheepshead (≤ 40 mm SL) collected in 21.3-m seines between 1996 and 2017 and fully-recruited Sheepshead (≥ 268 mm SL) collected in 183-m haul seines between 1996 and 2017 during stratified-random sampling from Tampa Bay and Charlotte Harbor estuarine systems. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gears and estuaries.
Relative abundance of young-of-the-year Sheepshead (≤ 40 mm SL) collected in 21.3-m seines between 1998 and 2017 and fully-recruited Sheepshead (≥ 268 mm SL) collected in 183-m haul seines between 1997 and 2017 during stratified-random sampling from Northeast Florida, Northern and Southern Indian River Lagoon estuarine systems. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gears and estuaries.
**Figure SP17-14.** Length frequency diagrams of Sheepshead collected in 183-m haul seines from Gulf coast Florida estuarine systems. Area after dashed line (---) indicates permitted recreational minimum harvest length (242 mm SL). All lengths are standard length (SL). Note different scales and years of collection among plots.
Figure SP17-15. Length frequency diagrams of Sheepshead collected in 183-m haul seines from Atlantic coast Florida estuarine systems. Area after dashed line (- - -) indicates permitted recreational minimum harvest length (242 mm SL). All lengths are standard length (SL). Note different scales and years of collection among plots.
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 1949; 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, and the northern IRL. 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.

Indices of abundance for YOY Striped Mullet on Florida’s northwest coast were variable. In Apalachicola Bay, IOAs for YOY for Striped Mullet reveal one strong year class in 2001 for riverine habitats and many strong classes throughout the study for bay habitats (Figure SP17-16). In Cedar Key, IOAs for YOY Striped Mullet reveal strong year classes in 2006 and 2011 for riverine habitats and 2006, 2008, and 2014 – 2017 for bay habitats.

In Tampa Bay, IOAs for YOY Striped Mullet show highly variable catch rates. In riverine habitats, 2001, 2006 – 2007, and 2010 – 2011 were strong year classes. In bay habitats, only one strong year class was evident in 2010 (Figure SP17-17). In Charlotte Harbor, IOAs for YOY Striped Mullet have also varied without trend in riverine and bay habitats. Several strong year classes were evident in 2001, 2006, and 2010 – 2011 in riverine habitats, and in bay habitats, 2008 and 2010. The similarity in the patterns of YOY abundance between Tampa Bay and Charlotte Harbor in riverine habitats (high recruitment in 2001, 2006, and 2010) observed during more than 20 years suggests that YOY Striped Mullet recruitment along parts of Florida’s Gulf coast may be influenced by factors which operate over regional scales.

Annual IOAs of YOY Striped Mullet in northeast Florida show two strong year classes in 2010 and 2011 in riverine habitats (Figure SP17-18). Annual IOAs of YOY Striped Mullet in the northern IRL reveal strong year classes in 2001 and 2010 in both riverine and bay habitats.
References


Figure SP17-16. Relative abundance of young-of-the-year Striped Mullet (≤ 35 mm SL) collected in 21.3-m seines between 1997 and 2017 during stratified-random sampling from Apalachicola Bay and Cedar Key. Separate plots for river and bay sets were created to examine differences in recruitment between the two habitats. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gear deployment techniques and estuaries.
Figure SP17-17. Relative abundance of young-of-the-year Striped Mullet (≤ 35 mm SL) collected in 21.3-m seines between 1996 and 2017 during stratified-random sampling from Tampa Bay and Charlotte Harbor. Separate plots for river and bay sets were created to examine differences in recruitment between the two habitats. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gear deployment techniques and estuaries.
Relative abundance of young-of-the-year Striped Mullet (≤ 35 mm SL) collected in 21.3-m seines between 1996 and 2017 during stratified-random sampling from Northeast Florida and the northern Indian River Lagoon. Separate plots for river and bay sets were created to examine differences in recruitment between the two habitats. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gear deployment techniques and estuaries.
Pinfish, *Lagodon rhomboides*

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

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

Annual IOAs of Pinfish on the northwest coast of Florida (Apalachicola Bay and Cedar Key) have had similar trends over time (Figure SP17-19). Annual IOAs of YOY Pinfish in bay habitats in Apalachicola Bay were low between 1998 and 1999 and have remained at higher but variable levels since. Strong year classes were evident in 2001, 2002, 2007, 2014, and more recently in 2017. In Cedar Key, annual IOAs were low in 1997 through 1999 followed by an increase in 2000. Subsequent to 2000, YOY abundances were variable across bay and river habitats with a notable high value in 2011 in river samples. The trend of annual IOAs of sub-adult and adult Pinfish in Apalachicola Bay remained stable from 1997–2017, but with peaks occurring in 2007 and 2010. In Cedar Key, annual IOAs for sub-adult and adult Pinfish were variable; however, relative increases were observed in 1998, 2002, 2011, and 2015.

Annual IOAs of YOY Pinfish in Tampa Bay and Charlotte Harbor exhibited similar trends, although relative abundance was generally higher in Charlotte Harbor (Figure SP17-20). In Tampa Bay, IOAs of YOY Pinfish in riverine and bay habitats indicated similar patterns of recruitment. In each habitat strong year classes occurred in 2001 and 2010 with the last three to five years showing lower recruitment. In Charlotte Harbor, a pattern similar to what was observed in Tampa Bay was evident with stronger year classes in 2001, 2004, and 2010 and poor year classes the last few years. In general, sub-adult and adult Pinfish in Tampa Bay showed an increase in abundance beginning in 2000 and peaking in 2008, after which the pattern became more variable, but remained at higher levels. A similar pattern was observed in sub-adult and adult Pinfish in Charlotte Harbor with a recent increase in adults observed in 2017.

Annual IOAs on the east coast of Florida differed by estuary (Figure SP17-21). Annual IOAs of YOY Pinfish in northeast Florida varied without trend from 2001–2009
followed by strong year classes in 2010, 2011, and 2013. Annual IOAs of sub-adult and adult Pinfish in northeast Florida have tracked well with YOY abundances since 2004. In the northern IRL, annual IOAs of YOY Pinfish have been highly variable between 1998 and 2011, after which abundance has remained stable at low levels. Annual IOAs of sub-adult and adult Pinfish in the northern IRL varied without trend throughout most of the time period with the exception of extremely high abundance in 2004 and 2011. Annual IOAs of sub-adult and adult Pinfish in the southern IRL have remained stable at low levels.

Length-frequency data collected across all years sampled with 183-m haul seines indicate that this gear provides valuable information on sub-adult and adult Pinfish (Figure SP17-22). Length-frequency distributions were generally unimodal in Tampa Bay, Charlotte Harbor, Cedar key, northeast Florida, and the northern IRL, while in Apalachicola Bay and southern IRL distributions were somewhat bimodal. Sub-adult and adult Pinfish began to become susceptible to capture in 183-m haul seines at ~50 mm SL. The peak size of capture for most estuaries was ~75–80 mm SL, except in the northern IRL where the largest proportion of fish captured were ~120–125 mm SL.
References


Relative abundance of young-of-the-year Pinfish ($\leq 80$ mm SL) collected in 21.3-m seines and of reproductively mature Pinfish ($\geq 100$ mm SL) collected in 183-m haul seines between 1997 and 2017 during stratified-random sampling of Apalachicola Bay and Cedar Key. Points represent the median estimate while the vertical bars represent the 25$^{th}$ – 75$^{th}$ percentiles. Note different scales of abundance among plots for different gears and estuaries.

Figure SP17.9.
Relative abundance of young-of-the-year Pinfish (≤ 80 mm SL) collected in 21.3-m seines and of reproductively mature Pinfish (≥ 100 mm SL) collected in 183-m haul seines between 1996 and 2017 during stratified-random sampling from Tampa Bay and Charlotte Harbor. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales for estimates from 21.3-m and 183-m seines.
Figure SP17-21. Relative abundance of young-of-the-year Pinfish ($\leq 80$ mm SL) collected in 21.3-m seines and of reproductively mature Pinfish ($\geq 100$ mm SL) collected in 183-m haul seines between 1997 and 2017 during stratified-random sampling from Northeast Florida and the Indian River Lagoon. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales for estimates from 21.3-m and 183-m seines.
Figure SP17-22. Length frequency diagrams of Pinfish collected in 183-m haul seines. All lengths are standard length (SL). Note different scales and years of collection.
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Common Snook, *Centropomus undecimalis*

Common Snook, *Centropomus undecimalis*, are found in estuaries, adjacent rivers, and in nearshore waters of the tropical and subtropical western Atlantic and Gulf of Mexico (Gilmore et al. 1983; Rivas 1986; Winner et al. 2010). This species supports an important recreational fishery in Florida and is one of the most popular gamefish in state waters. There has been no legal commercial harvest of Common Snook in Florida since the State Legislature declared it a gamefish in 1957 and prohibited its sale. Fishing effort targeting Common Snook has increased consistently over the past 30 years on both coasts, but more so on Florida’s Gulf coast (Muller 2015). While the overall harvest of snook has declined since the mid-1990s the numbers of Common Snook caught and released has remained consistently high over the past 25 years (Muller 2015). Recent estimates of transitional spawning potential ratios were near the 40% objective on the Atlantic coast and far exceeded this objective (~ 60%) on the Gulf coast, therefore both stocks are currently meeting agency management objectives. In response to cold-weather 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 (State of Florida Executive Order No. E0 10-45). At the June 2011 Florida Fish and Wildlife Conservation Commission Meeting, Commissioners concluded that the Atlantic coast stock was less severely impacted by cold weather than the Gulf coast. Based on this information, the Commissioners ruled to reopen Common Snook harvest on September 1, 2011 in Atlantic waters, but Gulf coast waters remained closed through August 31, 2013.

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

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

The FIM program also monitored the relative abundances of large juvenile and adult Common Snook in Florida estuaries within the range of this species. Individuals between 200 mm and 609 mm SL were included in the IOA since they are typically reproductively mature males and serve as a “pre-recruitment” indicator to the fishery. The upper limit of 609 mm SL used in this IOA corresponds to the lower regulatory minimum size of 711 mm total length (TL). Data from stratified-random 183-m haul seines were used to develop IOAs for reproductively mature Common Snook within Tampa Bay, Charlotte Harbor, northern IRL, and southern IRL. These IOAs were derived by including all Common Snook between 200 – 609 mm SL collected between January and December from 1996 – 2017.

Annual IOAs of YOY Common Snook in Tampa Bay have been stable but low between 1996 and 2017 with the exception of strong year classes evident in 1999, 2012, and 2013 (Figure SP17-01). After two back to back years of peak juvenile recruitment (2012 and 2013) in Tampa Bay, IOAs of YOY Common Snook declined significantly to a level more consistent with previous years, but has increased each year since. Annual IOAs of pre-fishery adult Common Snook (200 – 609 mm SL) on Florida’s west coast varied within each estuary. In Tampa Bay, adult Common Snook relative abundance
increased gradually from 1996 through 2003, followed by a decline in 2004 and remained stable through 2007. In 2008 relative abundance peaked again followed by a sharp decline in 2009 through 2011. Adult Common Snook relative abundance in Tampa Bay has increased each year since 2011 with the highest abundance in 20 years reported in 2016 and 2017. Annual IOAs of pre-fishery adult Common Snook in Charlotte Harbor remained stable from 1996 through 2009, with slight peaks in 2001 and 2002. After a decline in the IOAs of pre-fishery adult Common Snook in 2010, abundances increased from 2011 through 2017 (Figure SP17-01).

Annual IOAs of YOY Common Snook in northern IRL have fluctuated substantially since 1999 (Figure SP17-23). Abundance peaked in 1999 followed by a decline through 2004. In 2004, abundance was substantially lower than any years prior or since. This year of extremely low recruitment may have resulted from displacement due to multiple hurricanes and not an actual decrease in abundance within this estuarine system. Young-of-the-year recruitment increased after 2004 through 2007. In 2009 and 2010 there was another decline followed by increasing abundance from 2011 through 2013. Similar to the Tampa Bay estuarine system, young-of-the-year recruitment decreased markedly in 2014 to a more historically average level and has only increased slightly in subsequent years. Annual IOAs of pre-fishery adult Common Snook (200 – 609 mm SL) remained stable from 1997 through 2009 in the northern IRL with a slight peak in 2004. Abundance in the northern IRL declined sharply after 2009, remained low for five years, increased in 2015 and has decreased slightly each year since. Annual IOAs of pre-fishery adult Common Snook in the southern IRL were highest in 1997 and declined each year through 2002. Relative abundance remained stable through 2009; however, as was observed in the other estuaries analyzed, abundance decreased even further in 2010 (during the cold kill event), remained low through 2012, and increased through 2014, followed by three years of slight decline from 2015 through 2017 (Figure SP17-23).

Length-frequency data collected with 183-m haul seines indicate that this gear provides valuable information on larger juvenile and adult Common Snook (Figure SP17-24). Length-frequency distributions were unimodal with a peak in distribution at 380 – 500 mm SL. There was no indication that the number of individuals declined
rapidly upon entering the legal slot-limit (609 – 699 mm SL on the Gulf coast and 609 – 677 mm SL on the Atlantic coast).
References


Figure SP17-23. Relative abundance of young-of-the-year Common Snook (≤ 50 mm SL) collected in 21.3-m seines and pre-fishery adult Common Snook (200 – 609 mm SL) collected in 183-m haul seines between 1996 and 2017 during stratified-random sampling from three Florida estuarine systems. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales of abundance among plots for different gears and estuaries.
Figure SP17-24. Length frequency diagrams of sub-adult and adult Common Snook collected in 183-m haul seines. All lengths are standard length (SL). Vertical dashed lines denote the recreational slot limit for this species (609 – 699 mm SL on the Gulf coast and 609 – 677 mm SL on the Atlantic coast). Note different scales and years of collection.
Blue Crab, *Callinectes sapidus*

Blue Crabs, *Callinectes sapidus*, support valuable commercial and recreational fisheries along the Gulf of Mexico (Gulf) and Atlantic coasts of Florida. From 1996 to 2012, commercial landings on Florida’s Gulf and Atlantic coasts averaged 7.2 and 3.5 million pounds per year and were worth an estimated 6.3 and 3.9 million dollars, respectively (NMFS 2014). Florida legislation banned entanglement nets in 1995, raising the concern that Blue Crab populations might experience increased fishing pressure from former net fishers. Even though annual commercial landings in the Gulf peaked in 1998 at almost 13 million pounds, catch-per-unit effort was already beginning to decline (Steele and Bert 1998). Landings have decreased over the years, with the lowest commercial landings of Blue Crab occurring in 2008 for the Gulf coast and 2009 for the Atlantic coast (NMFS 2014). Commercial fishing effort for Blue Crab has been limited in recent years by restricted species permits although there are no quotas for Blue Crab landings. The annual recreational harvest of Blue Crab is not currently known or surveyed, so the total catch may be much higher than the recorded commercial landings. The 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 (Sillman and Bertness 2002). Blue Crab are prey for important sportfish species such as Black Drum (Simmons and Breuer 1962), Red Drum (Gunter 1945; Scharf and Schlicht 2000), Common Snook (Blewett et al. 2006), and Cobia (Meyer and Franks 1996). In addition to predation and harvest by humans, Blue Crab populations are affected by a myriad of other factors such as freshwater inflows (Wilber 1994; Flaherty and Guenther 2011), pesticides, disease, and habitat alteration. Spawning in Florida generally occurs from
March through October with some limited spawning reported during winter months (Steele and Bert 1994).

To monitor year-class strength and improve the ability to predict future adult Blue Crab abundances, relative indices of abundance (IOAs) were developed for YOY Blue Crab recruitment from selected Florida estuaries. Abundance data for YOY Blue Crab (≤ 80 mm carapace width [CW]; Archambault et al. 1990; Steele and Bert 1994) collected in stratified-random 21.3-m seine samples were examined to assess recruitment into six Florida estuaries: Apalachicola Bay, Cedar Key, Tampa Bay, Charlotte Harbor, Northeast Florida, and northern Indian River Lagoon (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 respective recruitment seasons for each estuary in subsequent analyses. Data collected from August through December of each year were combined with data from January through March of the following year to create a biological year of data. The IOA for 2017 therefore only included data from August through December 2017. 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, at which time Zones H and F were added, respectively, and 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 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 seine catches. 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).

The trends in annual IOAs of Blue Crab on Florida’s northwest coast varied between estuaries (Figure SP17-25). Annual IOAs of YOY Blue Crab in riverine habitats of Apalachicola Bay were relatively stable with a peak in abundance occurring in 2006.
While YOY IOAs from bay habitats in this system were consistently lower than those in riverine habits, bay habitats also experienced a peak in abundance in 2006. Annual IOAs of adult Blue Crab in Apalachicola Bay have remained relatively stable with peaks of abundance observed initially in 1998 and then again in 2006. In Cedar Key, IOAs of YOY Blue Crab in riverine habitats peaked in 1999 and, after declining in 2000, have since remained at lower but stable levels. Annual IOAs of YOY Blue Crab in bay habitats of Cedar Key were relatively stable with peaks of abundance occurring in 1998 – 1999, 2006, and 2010. A gradual increase in abundance was observed between 2013 and 2017, with a peak in 2017. Annual IOAs of adult Blue Crab in Cedar Key peaked in 1998, and have varied without trend since 1999.


Annual IOAs of Blue Crab on Florida’s Atlantic coast varied by estuary and year (Figure SP17-27). Annual IOAs of YOY Blue Crab in Northeast Florida peaked in 2003 and 2011, and then decreased to lower but stable levels from 2012 – 2017. Annual IOAs of adult Blue Crab were also variable with peak abundances occurring in 2007, followed by abundances that have varied without trend between 2008 and 2017. Annual IOAs of YOY Blue Crab in riverine portions of the northern IRL generally exhibited an increasing trend in abundance from 2001 – 2011, before declining to lower but steadier levels of abundance between 2012 – 2017. Young-of-the-year IOAs from bay habitats peaked in 2005 and 2007, after which abundances remained at lower levels from 2008 – 2017. Annual IOAs for adult Blue Crab in the northern and southern IRL were relatively low but stable with a peak in abundance occurring in 2005 in the northern IRL and in 2006 in the

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southern IRL.

Length-frequency data for Blue Crabs collected with 183-m haul seines indicate that this gear provides valuable information on adult Blue Crab in Florida estuaries (Figure SP17-28). Length-frequency distributions for Tampa Bay, Charlotte Harbor, and northern IRL were unimodal with the primary range of Blue Crab sizes between ~ 70 – 150 mm CW, while in Cedar Key, the distribution favored smaller Blue Crab (~ 50 – 70 mm CW). The size distributions for Apalachicola Bay, Northeast Florida, and southern IRL were similar but bimodal with modes occurring at ~ 50 – 70 mm CW and ~ 120 – 150 mm CW.
References


Figure SP17-25. Relative abundance of young-of-the-year Blue Crab (≤ 80 mm CW) collected in 21.3-m seines and of adult Blue Crab (> 80 mm CW) collected in 183-m haul seines between 1996 and 2017 during stratified-random sampling of Apalachicola Bay and Cedar Key. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales for estimates from 21.3-m and 183-m seines. The biological year median estimate for 2017 YOY Blue crabs only includes partial data (August-December 2017).
Relative abundance of young-of-the-year Blue Crab ($\leq 80$ mm CW) collected in 21.3-m seines and of adult Blue Crab ($>80$ mm CW) collected in 183-m haul seines between 1996 and 2017 during stratified-random sampling from Tampa Bay and Charlotte Harbor. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales for estimates from 21.3-m and 183-m seines. The biological year median estimate for 2017 YOY Blue crabs only includes partial data (August-December 2017).
Relative abundance of young-of-the-year Blue Crab ($\leq 80$ mm CW) collected in 21.3-m seines and of adult Blue Crab (> 80 mm CW) collected in 183-m haul seines between 1997 and 2017 during stratified-random sampling from Northeast Florida and the Indian River Lagoon. Points represent the median estimate while the vertical bars represent the 25th – 75th percentiles. Note different scales for estimates from 21.3-m and 183-m seines. The biological year median estimate for 2017 YOY Blue crabs only includes partial data (August-December 2017).
Figure SP17-28. 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.