Ladyfish,  
*Elops saurus*  
Linnaeus, 1766

Ladyfish are found throughout Florida’s nearshore and estuarine habitats. In the western Atlantic, ladyfish range from southern New England and Bermuda, throughout the Gulf of Mexico, to Rio de Janeiro, Brazil (Bigelow and Schroeder 1953). There may be more than one species or stock of ladyfish in Florida waters: a southern low-myomere-count stock and a northern, high-myomere-count stock (Eldred and Lyons 1966; Smith 1989). Late larval and juvenile ladyfish inhabit coastal beaches, canals, rivers, and mosquito impoundments (Gilmore et al. 1981). In general, juveniles seek waters with lower than full-strength salinity: 23 ppt–25 ppt (McBride et al. 2001). Adults usually live in coastal or nearshore areas. Length-frequency analysis suggests ladyfish in Tampa Bay grow to 200 mm–300 mm standard length by age 1; by age 2, they reach 300 mm–400 mm, and they are larger than 400 mm by age 3 (McBride et al. 2001). Ladyfish that live in hypersaline lagoons in Cuba grow slower, reaching only 247 mm standard length at the time when their third annulus formed (Table 1; Carles 1967). Ladyfish reach a maximum size of about 39 inches, a weight of about 15 pounds (Zale and Merrifield 1989), and possibly 6 years of age (Palko 1984). Based on the spatial and temporal patterns of collections of early larvae, spawning probably occurs in offshore waters during the fall (Hildebrand 1943).

Table 1. Von Bertalanffy growth parameters and length-weight relations for ladyfish

<table>
<thead>
<tr>
<th>Inches FL = L∞(1-e^{-K(age-t_0)})</th>
<th>K</th>
<th>L∞(inches FL)</th>
<th>t_0 (years)</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex combined, southeast Cuba</td>
<td>0.22</td>
<td>19.2</td>
<td>-0.54</td>
<td>Carles (1967)</td>
</tr>
<tr>
<td>Sex combined, Cuba</td>
<td>0.30</td>
<td>18.9</td>
<td></td>
<td>Perez and Rubio (1986)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Weight in lbs = a (inches FL)^b</th>
<th>a</th>
<th>b</th>
<th>Source</th>
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</thead>
<tbody>
<tr>
<td>Sex combined</td>
<td>0.000302</td>
<td>2.97</td>
<td>Bohnsack and Harper (1988)</td>
</tr>
</tbody>
</table>

Adult ladyfish feed primarily on fish. Sekavec (1974) found that fish constituted 94% of food items found in ladyfish stomachs; Darnell (1958) also found that fish made up a substantial portion (82%) of the ladyfish diet, and Knapp (1949) found that fish accounted for 34% of food items found in ladyfish stomachs. In Sekavec’s study, juvenile gulf menhaden composed 72% of the identifiable fish consumed. Decapod crustaceans are also important foods for ladyfish.

During 2009, the total annual landings of ladyfish in Florida were 825,009 pounds; most (75%) were landed by the commercial fishery. Landings were greater on the gulf coast, where about 91% of the statewide landings were made in 2009. The commercial landings were greatest in Lee, Manatee, Pinellas, and Hernando Counties (Fig. 1a). The recreational fishery, which landed ladyfish throughout the state, landed a slightly larger number in southwest Florida (Fig. 1b).

Florida’s 1995 constitutional amendment eliminating the use of entangling nets in state waters severely restricted this fishery. The July 2000 prohibition of the use of tarp nets in the Panhandle region created an additional restriction to the commercial harvest of ladyfish. The 2009 total landings were 36% lower than the average landings in the previous five years (2004–
2008) and were 72% lower than the 1982–2009 historical average landings (Fig. 2). Total annual landings on the Atlantic coast are a negligible part of the statewide catch, reaching 0.15 million pounds in 2005 (Fig. 2). Total annual landings of ladyfish along the gulf coast increased between 1982 and 1990 then declined from a peak of about 5.86 million pounds in 1990 to 1.87 million pounds in 1996. In 1999, gulf coast total annual landings increased to about 4.25 million pounds, then sharply declined to 0.4 million pounds in 2000 before increasing again to about 1.7 million pounds during 2002-2003, but have decreased to around 1 million pounds in 2006 and 2008 (Fig. 2).

Landings rates for the Atlantic coast commercial fisheries have slowly declined since 1996 (Fig. 3a). On the gulf coast, landings rates have rapidly increased nearly four-fold since 1997 (Fig. 3b). Recreational total catch rates on the Atlantic and gulf coasts varied without a long-term trend during 1991-2009 (Figs. 3c-d).

The indices of abundance for young-of-the-year (YOY) ladyfish varied without trend on both coasts with strong year classes in 1998, 2003 and 2006 on the gulf coast (Figs. 4a-b). Abundances of post-YOY ladyfish have remained fairly steady on the Atlantic coast with a low in 2006 and a high in 2008 (Fig. 4c). On the gulf coast the post-YOY abundance index follows a cyclical pattern with highs in 2000 and 2008 (Fig. 4d). Occurrence of gross external abnormalities was consistent from year to year with no discernible trend on both coasts (Figs. 5a-b). On the Atlantic coast the majority of abnormalities were erosion/scale loss, while on the gulf coast ulcer/lesions were most persistent (Figs. 5c-d).

No formal stock assessment for ladyfish is available at this time.
a. Commercial landings (pounds)  
b. Recreational landings (numbers)

Figure 1 (a)-(b). Geographic distribution of ladyfish landed during 2009. (a) Commercial landings (pounds) by county; (b) Recreational landings (numbers of fish) by region.

Figure 2. Total annual landings (pounds) of ladyfish on the Atlantic and gulf coasts of Florida, 1982–2009.
Figure 3 (a)-(d). Annual standardized landings rates for ladyfish in Florida. Commercial landings rates (pounds/trip), 1992-2009: (a) Atlantic Coast; (b) Gulf Coast. Recreational total catch rates (numbers/trip), 1991-2009: (c) Atlantic Coast; (d) Gulf Coast.
Figure 4(a)-(d). Proportion of fishery-independent-monitoring sets that captured ladyfish from 1997-2009. Young-of-the-year (YOY): (a) Atlantic coast; (b) Gulf coast. Post-YOY: (c) Atlantic Coast; (d) Gulf coast.
a. Atlantic coast proportion to total collected

b. Gulf coast proportion to total collected

c. Atlantic coast percentage of abnormality types

Percentage of gross external abnormalities

- Broken/scale loss: 50%
- Upper/lesion: 50%
- Other: 100%

Figure 5(a)-(d). Gross external abnormalities of ladyfish ≥ 75mm collected in fishery-independent-monitoring sets, 1999-2009. Breakdown of gross external abnormalities by coast: (a) Atlantic coast; (b) Gulf coast. Percentage of abnormalities by type: (c) Atlantic Coast; (d) Gulf coast