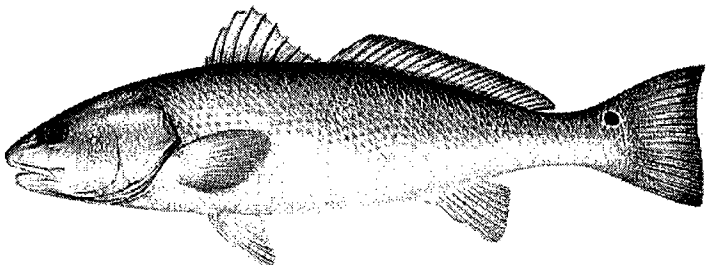
Red drum, *Sciaenops ocellatus*



Red drum are found throughout Florida's nearshore waters. Gold and Richardson (1991) identified weakly differentiated subpopulations occurring in the northeast Gulf of Mexico, Mosquito Lagoon, and along the coasts of North and South Carolina. Seyoum *et al.* (2000) also found genetic evidence for separate populations on Florida's gulf and Atlantic coasts but found no evidence of a separate population in Mosquito Lagoon. Red drum along the Gulf of Mexico side of the Florida peninsula may be somewhat isolated from red drum in the northern and western gulf.

Newly hatched red drum spend about 20 days in the water column before becoming demersal (Rooker *et al.* 1999). Small juvenile red drum seek out and inhabit rivers, bays, canals, tidal creeks, boat basins, and passes within estuaries (Peters and McMichael 1987). Subadults are found in these habitats and in large aggregations on seagrass beds and over oyster bars, mud flats, or sand bottoms. Adult red drum are found mostly in nearshore shelf waters, except where they occur within the Mosquito-Indian River Lagoon complex on Florida's Atlantic coast. Growth is very rapid through ages 4–5 (Table 1). Maximum age is about 40 years in Florida (Murphy and Taylor 1990), but there are reports of red drum as old as 60 years in North Carolina waters (Ross *et al.* 1995). Males mature when 1–3 years old, and females mature when 3–6 years old. Red drum spawn during the late summer and early fall in inlets, within estuaries, or in nearshore shelf waters.

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

Inches FL = $L_\infty (1-e^{-K(age-t_0)})$	K	L_∞ (inches FL)	t_o (years)	Source
Combined sexes, Atlantic coast of Florida	0.418	38.6	-0.149	Murphy and Taylor (1990)
Combined sexes, gulf coast of Florida	0.460	36.8	0.029	Murphy and Taylor (1990)

Weight in lbs = a (inches FL)^b	a	b	Source
Combined sexes, Atlantic coast of Florida	0.000371	3.0275	Murphy and Taylor (1990)
Combined sexes, gulf coast of Florida	0.000306	3.0984	Murphy and Taylor (1990)

Juvenile red drum feed primarily on copepods, mysid shrimp, and amphipods (Peters and McMichael 1987). Menhaden and anchovies were the most important prey for adult red drum in the winter and spring; crabs and shrimp were the most important prey in the summer and fall (Boothby and Avault 1971).

The sale of red drum in Florida is prohibited (Florida Administrative Code, chapter 68B-22.005(2)) precluding any commercial harvest. In 2004, recreational red drum landings totaled 1,948,007 pounds. Landings were greater on the gulf coast, where about 66% of the statewide

landings were made. The 2004 recreational landings of red drum were greatest along the southern Big Bend area south through the southwest Florida region and in the north and central regions of the Atlantic coast (Fig. 1). Since 1989, when current regulations were enacted, landings slowly increased on the Atlantic through about 2000 and 2001 before dropping to lower levels during 2002-2004. Since 1989, gulf landings have fluctuated with occasional peaks, i.e., 1992, 2000, and 2003 (Fig. 2). The 2003 total landings of red drum were 7% lower than the average landings in the previous five years (1999–2003) and were 8% lower than the average historical landings (1982–2004).

During the mid-1980s, high total-catch rates occurred when the red drum standing stock increased subsequent to several moratoria prohibiting red drum harvest. On the Atlantic coast catch rates declined from 1995 through 2000 before holding steady through 2003 then increasing in 2004 (Fig. 3). Gulf coast total-catch rates showed a slower decline from 1991 through 2002 before rebounding in 2003 and 2004 (Fig. 4).

Young-of-the-year abundance indices of red drum on the both coasts increased markedly after 2001 (Figs. 5, 6). Abundances of post-YOY red drum were highest from 2000 to 2002 and in 2004 on the Atlantic coast, while abundances on the gulf coast were highest during the period 1998-2001 (Figs. 7, 8). Few red drum were collected exhibiting gross external abnormalities on the Atlantic coast, while the proportion of affected red drum on the gulf coast varied without trend (Figs. 9, 10). Tumors/cysts were the only gross abnormalities encountered on the Atlantic coast, while red/bloody areas and parasites were the two most common afflictions in red drum on the gulf coast (Figs. 11, 12).

Escapement rates and direct evidence from the age composition of adults in the gulf off Tampa Bay indicate that the adult stocks of red drum are rebuilding after the years of overfishing that occurred prior to the mid-1980s. Studies by FWC-FMRI appear to indicate that the offshore stock of red drum (mostly fish older than age 5) is increasing in abundance as new recruits move into the population (Murphy and Crabtree 2001).

Coastwide assessments suggest that the Atlantic and gulf red drum stocks are still overfished but that both are recovering (Goodyear 1996a, Vaughan 1996, Vaughan and Carmichael 2000). Porch (2000), however, suggests that red drum stocks are not recovering. His gulfwide assessment showed that fishing mortality rates on subadults, particularly age-2 fish, were still high enough in 1998 that the spawning potential ratio of the stock was not likely to achieve 20% (Porch 2000).

Murphy (2002) indicated that the average instantaneous fishing mortalities on both coasts of Florida peaked during the mid 1980s, declined during the late 1980s, and increased to relatively stable levels by the mid-1990s. Because there was no information at that time on the sizes of red drum that died subsequent to being released alive, a large portion of the harvest, the condition of the red drum stocks in Florida could not be precisely determined. Murphy (2005) incorporated some information on the sizes of released fish into an updated assessment of red drum in Florida. Findings from these analyses indicated that year-class specific escapement rates were 34% on the Atlantic coast and 32% on the gulf coast in 2003.

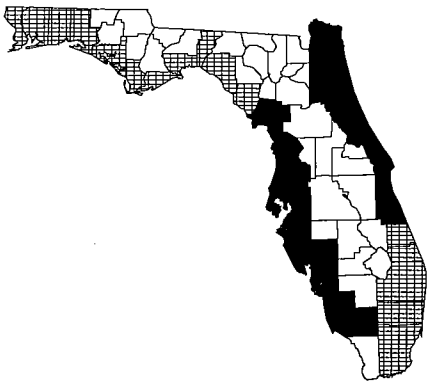


Figure 1. Geographic distribution of recreational landings of red drum landings during 2004

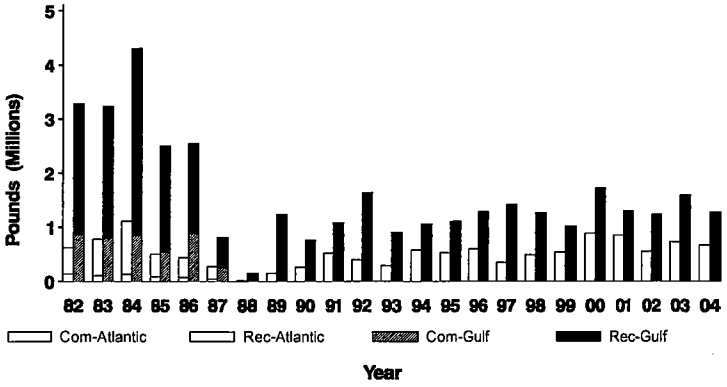


Figure 2. Total annual landings of red drum on the Atlantic and gulf coasts of Florida, 1982–2004

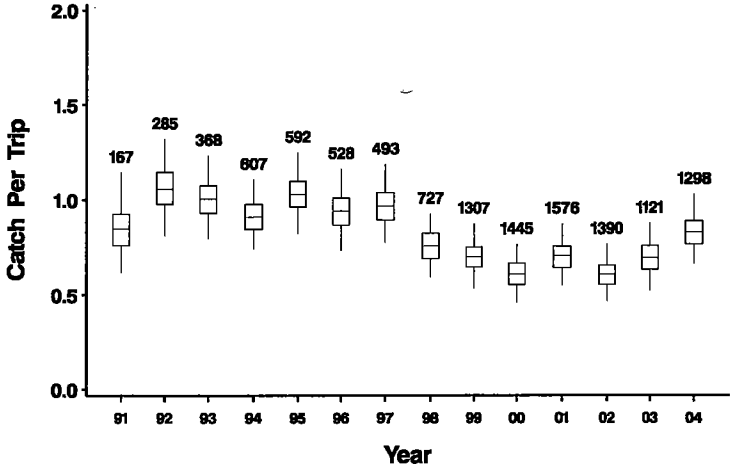


Figure 3. Annual standardized recreational total-catch rates (numbers) for red drum on the Atlantic coast of Florida, 1991–2004

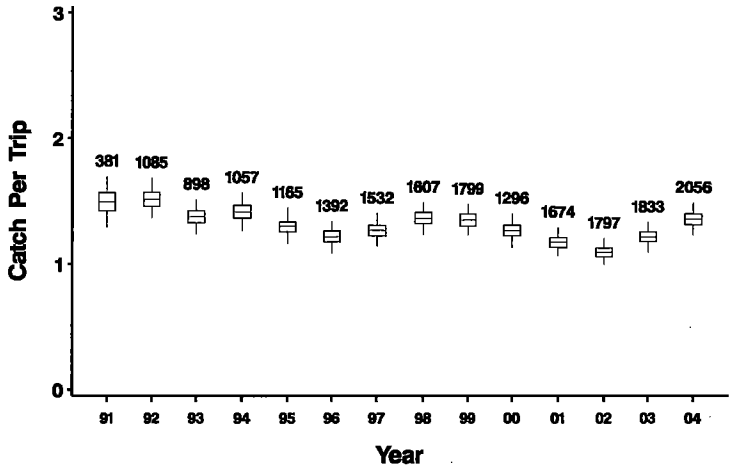


Figure 4. Annual standardized recreational total-catch rates (numbers) for red drum on the gulf coast of Florida, 1991–2004

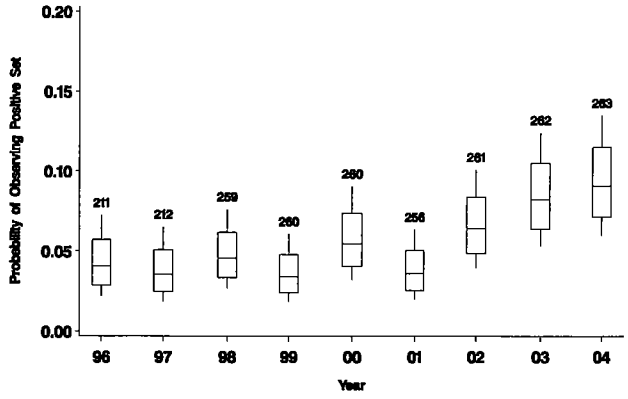


Figure 5. Percentage of Fishery Independent Monitoring sets on the Atlantic coast that captured young-of-the-year red drum, 1996-2004

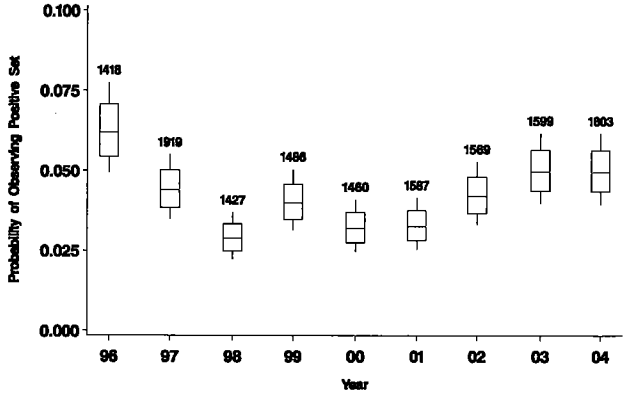


Figure 6. Percentage of Fishery Independent Monitoring sets on the gulf coast that captured young-of-the-year red drum, 1996-2004

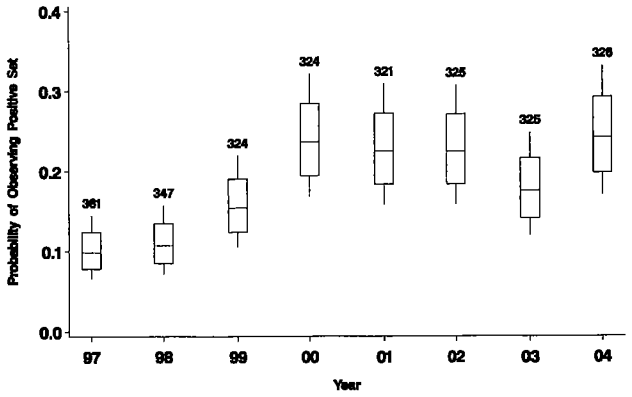


Figure 7. Percentage of Fishery Independent Monitoring sets on the Atlantic coast that captured post-young-of-the-year red drum, 1997-2004

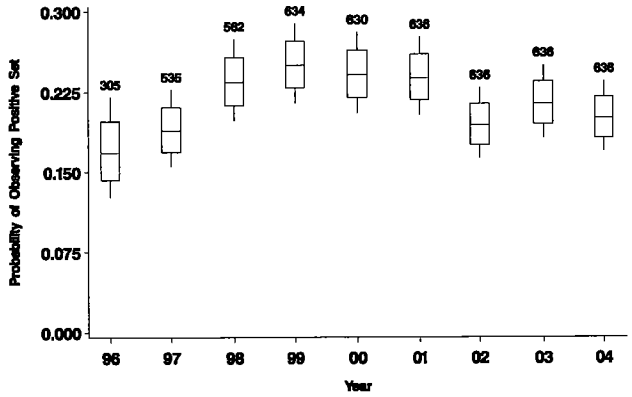


Figure 8. Percentage of Fishery Independent Monitoring sets on the gulf coast that captured post-young-of-the-year red drum, 1996-2004

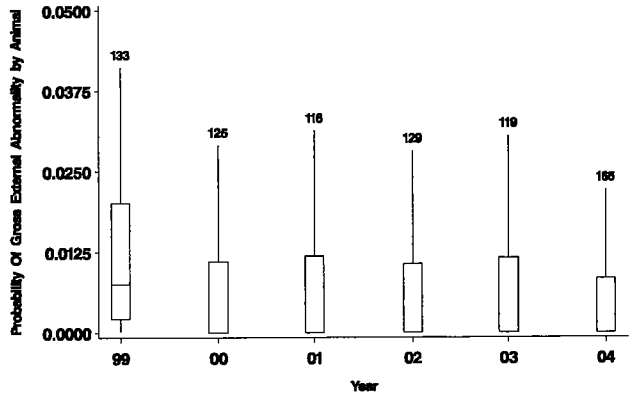


Figure 9. Proportion of red drum ≥ 75 mm collected in Fisheries-Independent Monitoring sets on the Atlantic coast that had gross external abnormalities, 1999-2004

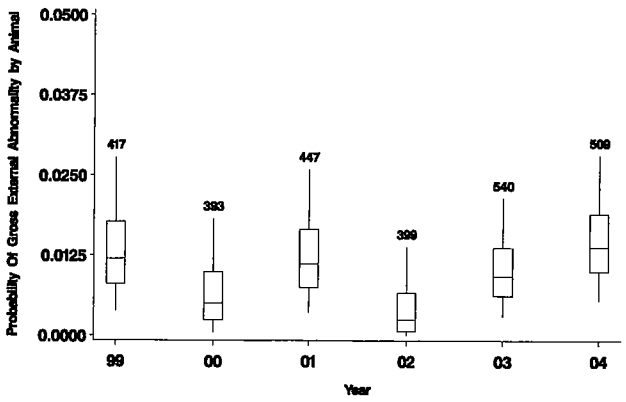


Figure 10. Proportion of red drum ≥ 75 mm collected in Fisheries-Independent Monitoring sets on the gulf coast that had gross external abnormalities, 1999-2004

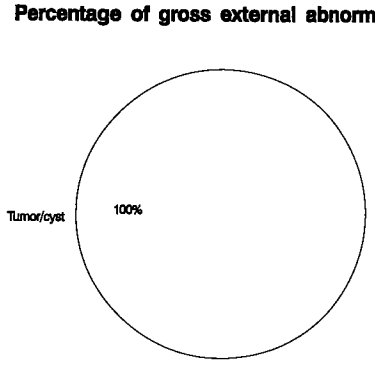


Figure 11. Proportions of different gross external abnormalities in red drum ≥ 75 mm collected in Fisheries-Independent Monitoring sets on the Atlantic coast, 1999-2004

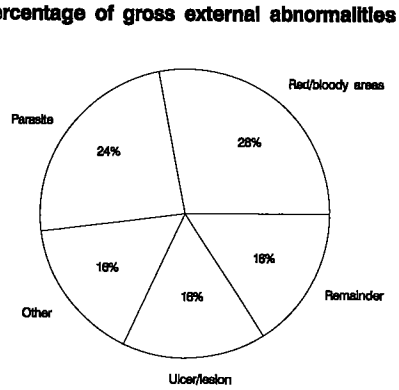


Figure 12. Proportions of different gross external abnormalities in red drum ≥ 75 mm collected in Fisheries-Independent Monitoring sets on the gulf coast, 1999-2004