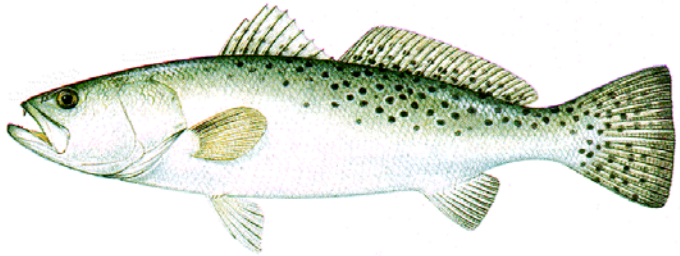
Spotted seatrout, *Cynoscion nebulosus*



Spotted seatrout range throughout Florida's bays and coastal waters. Studies indicate that spotted seatrout from various areas of Florida are more genetically isolated from one another as their geographic separation increases (Ramsey and Wakeman 1987, Gold *et al.* 1999). Results from a re-analysis of spotted seatrout genetic structure in Florida show the presence of five genetic spotted seatrout stocks (Wilson *et al.* 2002). These stocks and their boundaries are: 1) a northeast stock located from approximately northern Volusia county to the Atlantic state border (and possibly beyond) 2) a southeast stock located from approximately southern Martin county north to Volusia county 3) a Biscayne Bay vicinity stock 4) several Florida Bay/ Keys stocks, in which a complex of populations subdivisions apparently exists, and 5) a gulf coast stock from Florida Bay through the Florida panhandle. Each area may have specific, localized groups of fish that do not intermix regularly with other groups, thus they are affected only by local fishing pressure. Gold and Richardson (1998) suggested that, based on their genetic analyses of spotted seatrout populations in the Gulf of Mexico, it appeared that female fidelity to their natal estuaries played an important role in maintaining subpopulations. Growth is sex- and area-specific. Males grow more slowly than females, and spotted seatrout in the Indian River Lagoon, and Apalachicola Bay grow more quickly than do those in southwest Florida (Table 1; Murphy and Taylor 1994). Maximum ages reached in Florida are 9 years for males and 8 years for females. Spotted seatrout first spawn between 0 and 2 years old and 11.8–15.7 inches total length (TL). Spawning occurs within estuaries and in nearshore waters during spring, summer, and fall.

Table 1. Gompertz growth parameters and length-weight relations for the spotted seatrout

Inches TL $=L_\infty \exp(e^{-K(age-t0)})$	K	L_∞(inches TL)	t_o (years)	Source
Female, Charlotte Harbor, Florida	0.36	27.4	0.39	Murphy and Taylor (1994)
Female, Indian River, Florida	0.36	33.0	0.74	Murphy and Taylor (1994)
Female, Apalachicola, Florida	0.349	32.1	0.68	Murphy and Taylor (1994)

Weight in lbs = a (inches TL)^b	a	b	Source
Male, Indian River, Florida	0.000202	3.1731	Murphy and Taylor (1994)
Male, Apalachicola, Florida	0.000509	2.8099	Murphy and Taylor (1994)
Female, Indian River, Florida	0.000231	3.1169	Murphy and Taylor (1994)
Female, Apalachicola, Florida	0.000465	2.8591	Murphy and Taylor (1994)

The diet of juvenile seatrout (<1.2 inches SL) includes amphipods, mysids, and carideans (Hettler 1989). Larger juveniles and adults feed primarily on shrimp and fish such as bay anchovy, gulf menhaden, shad, mullet, sheepshead minnow, gulf toadfish, pipefish, pinfish, pigfish, silver jenny, Atlantic croaker, and spotted seatrout (Hettler 1989; McMichael and Peters 1989).

Spotted seatrout landings totaled 2,963,147 pounds during 2006. The recreational fishery

made most (99 % by weight) of the total statewide landings. Landings were greater on the gulf coast during 2006, where about 81% of the statewide landings were made. Since 1996, the fishery has moved from what was a mixed-sector fishery, with about 20% of the landings made by commercial fishers, to an almost exclusive recreational fishery. In 2006, the small commercial fishery landed spotted seatrout in almost all coastal counties, adjacent to large estuaries or nearshore grassflats, e.g., Lee County on Charlotte Harbor and Volusia, Indian River, and St. Lucie Counties on or near the Indian River Lagoon (Fig. 1). Recreational landings made during 2006 were highest throughout Florida's gulf coast except in Monroe County, and in the north and central regions of the Atlantic coast (Fig. 2).

The 2006 total landings of spotted seatrout were 4% lower than the average landings in the previous five years (2001–2005) and were 36% lower than the 1982-2006 historical average landings (Fig. 3). Total Atlantic coast annual landings of spotted seatrout dropped sharply in 1988 (Fig. 3). On the gulf coast, total landings have fluctuated after a generally decline from 1989 to 1996 (Fig. 3).

The commercial fishery was under a quota and trip-limit system from November 1989 until January 1996, and this is partially responsible for maintaining stable commercial catch rates through the mid-1990s (Figs. 4, 5). More recently, elimination of entangling nets and the limits on the commercial season in Florida waters severely affected the commercial fishery. Commercial catch rates on the Atlantic coast have shown little change since 1992 though recent rates are up somewhat (Figs. 4). On the gulf coast, commercial catch rates have increased each year between 2001 and 2005 then dropped markedly in 2006 (Fig. 5). Total-catch rates for anglers fluctuated without trend on both coasts since 1991, with both coasts showing a similar pattern of decline between 1999 and a very low catch rate in 2001(Figs. 6 and 7).

The index of abundance for young-of-the-year spotted seatrout on the Atlantic coast fluctuated without trend since 1996 (Fig. 8). The gulf coast index was fairly stable during 1997-2004 following a relatively strong year class in 1996, but decreased to lower levels during 2005 and 2006 (Fig. 9). Post-young-of-the-year abundance showed a U-shape on the Atlantic coast during 1998-2005 with a low in 2001 (Fig. 10). The 2006 post-YOY catch rate in 2006 was as low as the observed 2001 minimum rate. The gulf coast index didn't show any long-term trend from 1996 onwards, except for a sharp increase during 1999 (Fig. 11). Increased prevalence of gross external abnormalities from spotted seatrout ≥75 mm SL was noted on both coasts in 1999 and 2000, and in 2005 on the Atlantic coast (Figs. 12, 13), with the only abnormalities observed on the Atlantic coast being erosion/scale loss. The gulf coast spotted seatrout showed a variety of abnormalities: ulcers/lesions, red/bloody areas, remainder, and "other" (Figs. 14, 15).

Transitional spawning potential ratios (tSPR) for spotted seatrout have trended strongly upward since about 1989 in all Florida management regions. In the northern regions tSPR was relatively flat during much of the 1980s whereas in the southern management region tSPR was increasing slowly (Murphy *et al.* 2006). In the Northwest region, tSPR increased across the 35% management threshold in 1997 and has fluctuated between 38 and 40% since then. In the Southwest region, the tSPR rose above 35% in 1993 and continued to increase through 1995 when it leveled off at about 46%. On the Atlantic coast, the tSPR's crossed the 35% management target in 1992 in the Southeast region and in 1997 in the Northeast region. In both areas tSPR continued to increase before leveling off in 1994 in the Southeast at about 49% (average for 1994-2005) and in 2002 in the Northeast at about 62% tSPR (2002-2005 average).

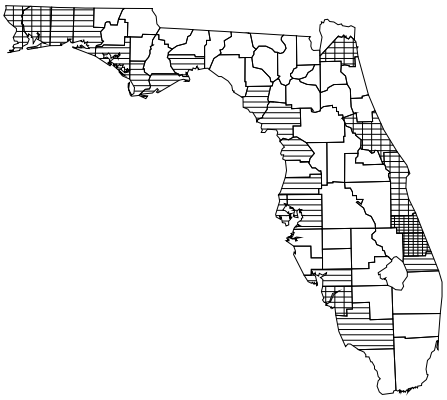


Figure 1. Geographic distribution of commercial landings of spotted seatrout during 2006

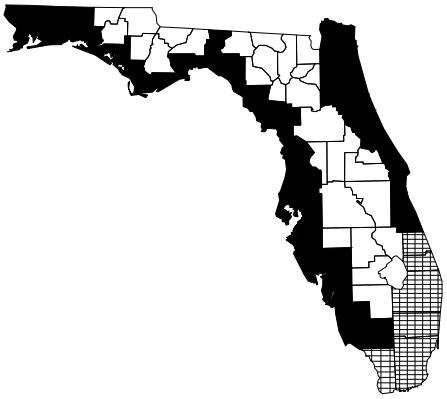


Figure 2. Geographic distribution of recreational landings of spotted seatrout during 2006

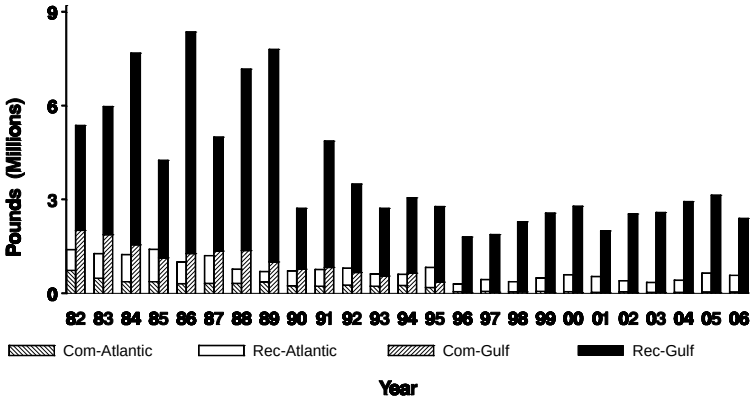


Figure 3. Total annual landings of spotted seatrout on the Atlantic and gulf coasts of Florida, 1982–2006

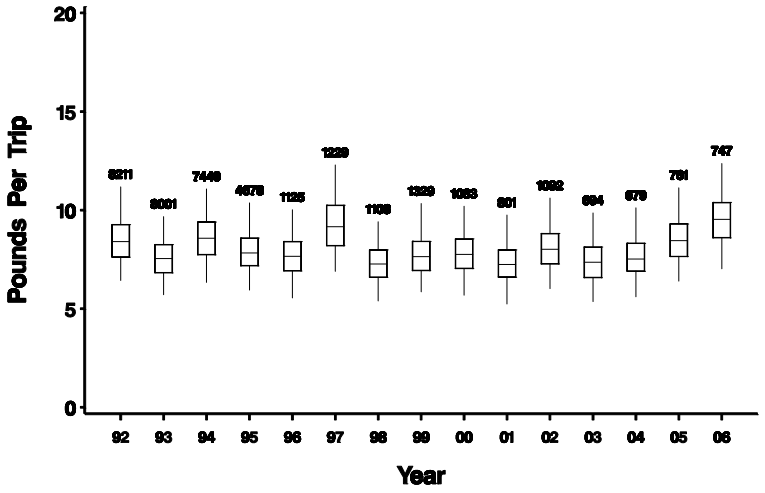


Figure 4. Annual standardized commercial catch rates (pounds) for spotted seatrout on the Atlantic coast of Florida, 1992–2006

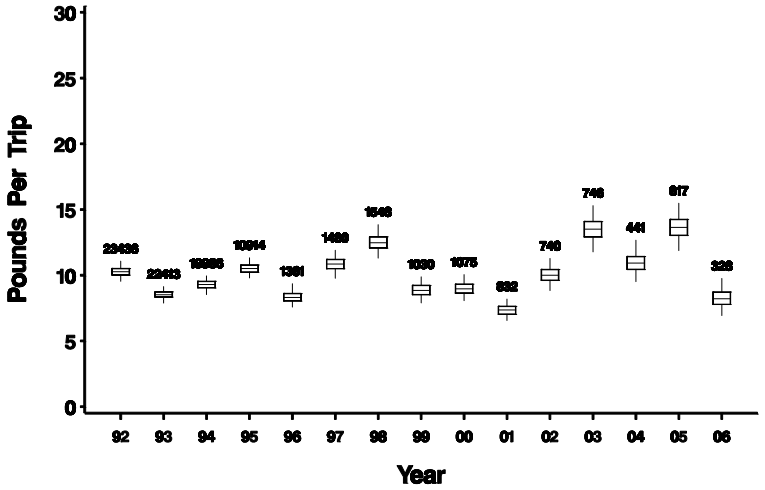


Figure 5. Annual standardized commercial catch rates (pounds) for spotted seatrout on the gulf coast of Florida, 1992–2006

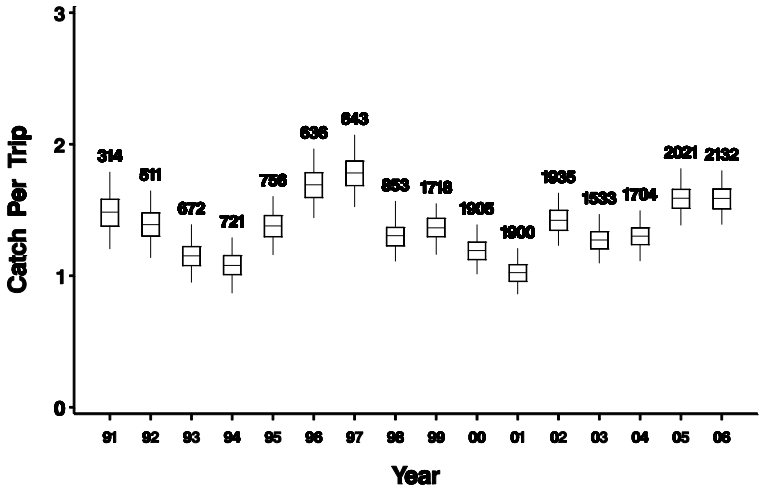


Figure 6. Annual standardized recreational total-catch rates (numbers) for spotted seatrout on the Atlantic coast of Florida, 1991–2006

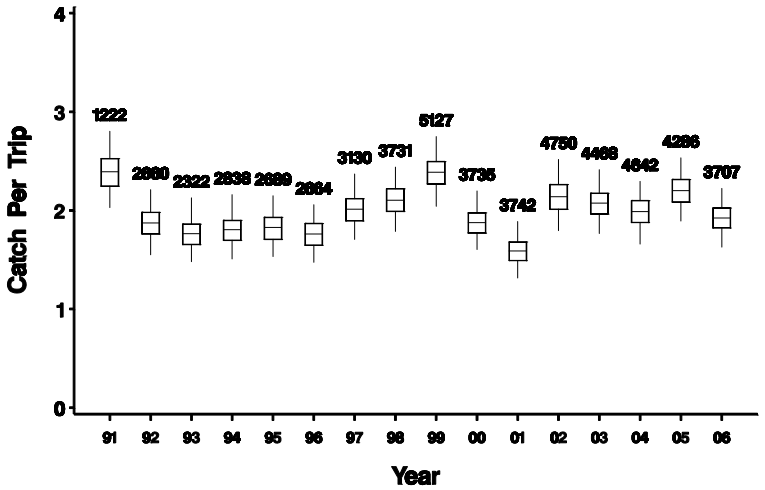


Figure 7. Annual standardized recreational total-catch rates (numbers) for spotted seatrout on the gulf coast of Florida, 1991–2006

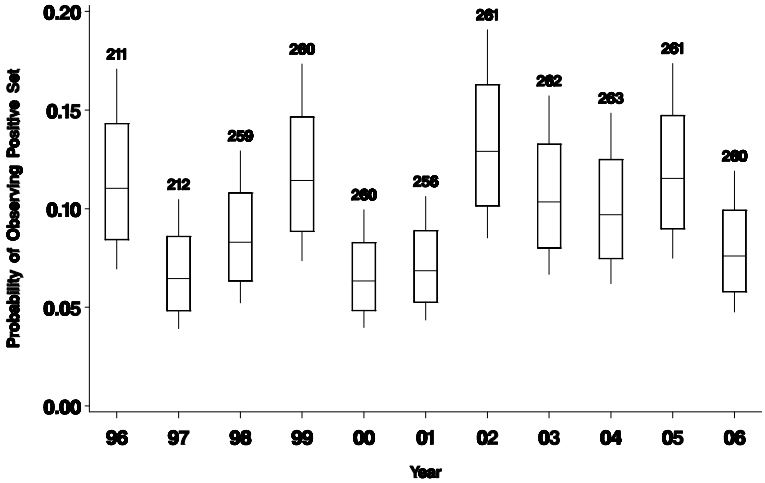


Figure 8. Percentage of Fisheries-Independent Monitoring sets on the Atlantic coast that captured young-of-the-year spotted seatrout, 1996-2006

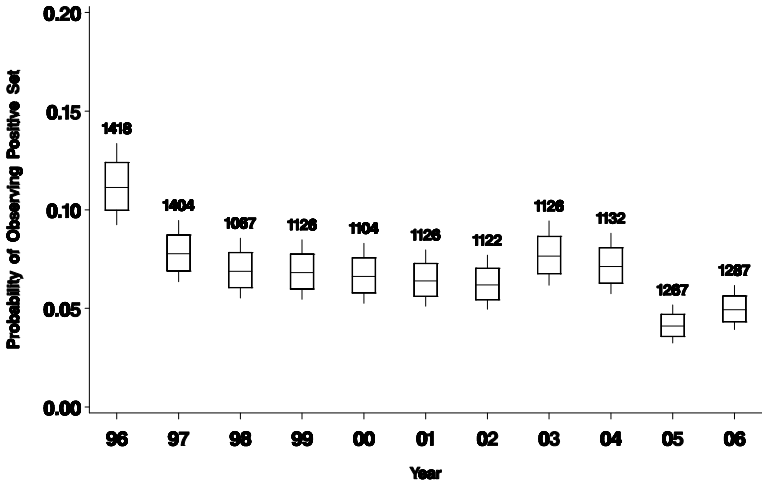


Figure 9. Percentage of Fisheries-Independent Monitoring sets on the gulf coast that captured young-of-the-year spotted seatrout, 1996-2006

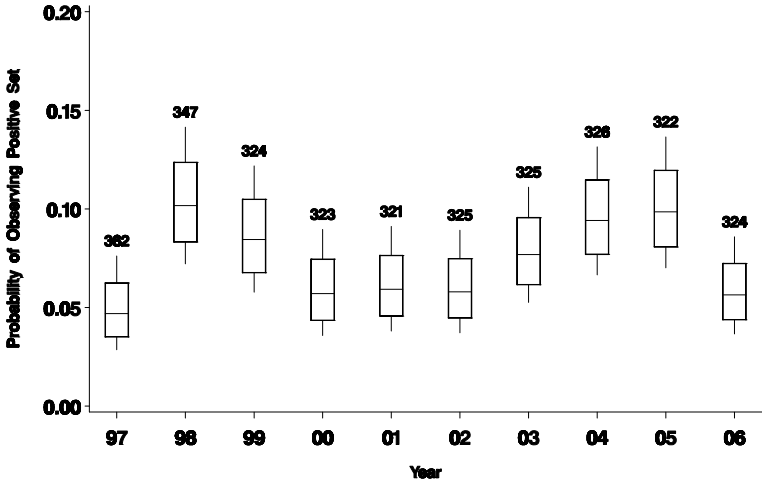
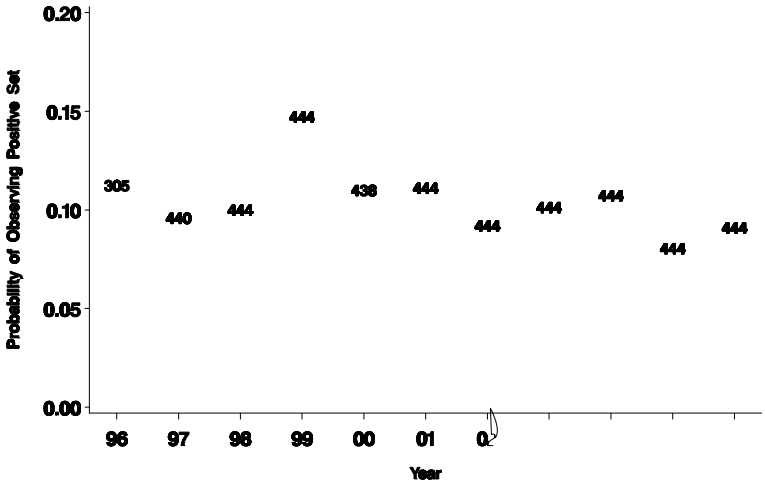


Figure 10. Percentage of Fisheries-Independent Monitoring sets on the Atlantic coast that captured post-young-of-the-year spotted seatrout, 1997-2006



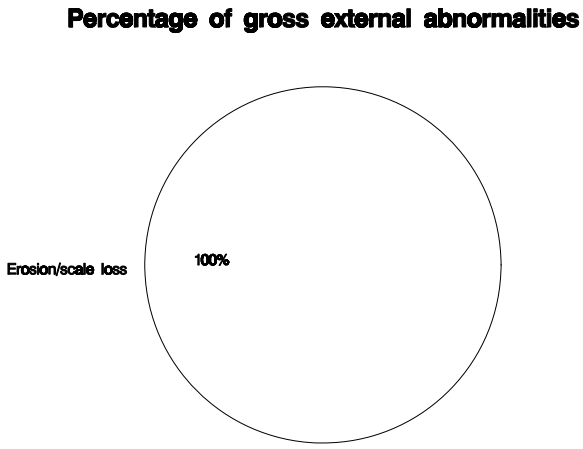


Figure 14. Proportions of different gross external abnormalities in spotted seatrout ≥75 mm SL collected in Fisheries-Independent Monitoring sets on the Atlantic coast, 1999-2006

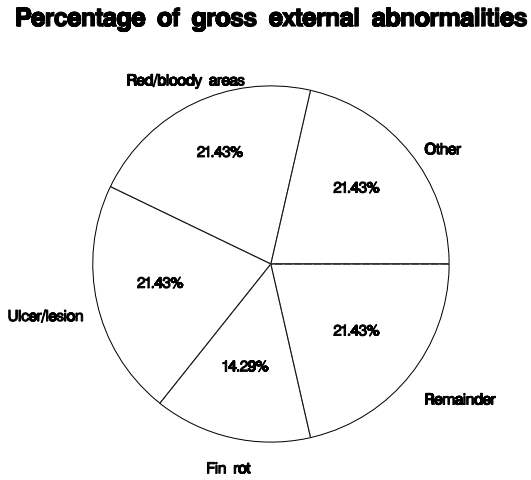


Figure 15. Proportions of different gross external abnormalities in spotted seatrout ≥75 mm SL collected in Fisheries-Independent Monitoring sets on the gulf coast, 1999-2006