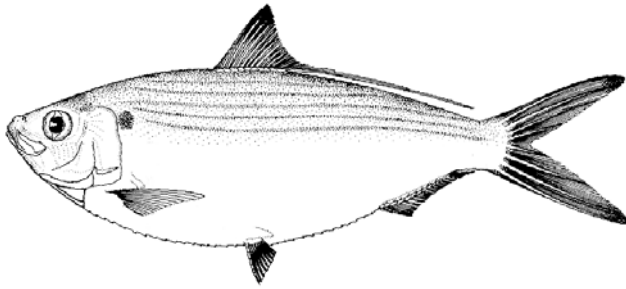


Atlantic thread herring, *Opisthonema oglinum*



Atlantic thread herring are widely distributed in the western Atlantic from the Gulf of Maine to Bermuda and throughout the Gulf of Mexico and West Indies southward to Brazil (Berry and Barrett 1963). In the northeastern Gulf of Mexico, they are found at depths less than 120 feet (Klima 1971). Schools of thread herring generally prefer shallow coastal waters and occur most frequently in the upper 3 meters of the water column. Adults generally follow an inshore-offshore, north-south movement pattern in response to water temperature (Fuss *et al.* 1969). Fork length (FL) of thread herring, taken from trawl surveys conducted between 1994 and 2001 along west central Florida, ranged from 4.1 inches to 7.9 inches. According to Reintjes (1979), they reach mean sizes of 5.6 inches at age 1, 5.7 inches at age 2, and 5.8 inches at age 3. Atlantic thread herring mature at 4.7–5.7 inches FL when age 1 or 2 (Berkeley and Houde 1984). Spawning occurs in nearshore shelf waters (to depth of about 100 feet) during March–July (Prest 1971).

Table 1. Von Bertalanffy growth parameters and length-weight relations for the Atlantic thread herring

Inches FL = $L_{\infty}(1 - e^{-K(\text{age}-t_0)})$	K	L_{∞} (inches FL)	t_0 (years)	Source
Sex combined, gulf coast of Florida	0.38	8.46	-0.98	Houde <i>et al.</i> (1983)

Weight in lbs = $a(\text{inches FL})^b$	a	b	Source
Males, gulf coast of Florida	0.000471	3.15	Berkeley and Houde (1984)
Females, gulf coast of Florida	0.000457	3.15	Berkeley and Houde (1984)

Adult thread herring feed on a variety of phytoplankton and zooplankton, which the herring strain from water through their numerous gill rakers. Dominant food organisms from fish collected off Fort Myers, Florida, included copepods, pelecypods, gastropods, larval barnacles, plant detritus, fish scales, and sediments (Fuss and Kelly 1968). The Atlantic thread herring is an important prey species eaten by many piscivorous fish, sea birds, and marine mammals (Reintjes 1979). Mackerel, bluefish, and crevalle jack have shown a preference for eating schooling fish such as herrings. Beaumariage (1973) found that 59% of the food eaten by king mackerel in Florida waters consisted of Atlantic thread herring and scaled sardine. Thread herring were a prey item eaten by bluefish off southeast Florida, south Florida, and northwest Florida (Naughton and Saloman 1984).

Statewide landings of Atlantic thread herring were 2,147,850 pounds during 2005. The commercial fishery makes 82% of the total Atlantic thread herring landings in Florida. Almost 88 percent of the total statewide landings are made on the gulf coast. The distribution of commercial landings reflects the distribution of the baitfish purse-seine fishery in the state: located just west of Cape San Blas, off Tampa Bay, and off southeast Florida (Fig. 1). Recreational landings of Atlantic thread herring were made primarily in south of Levy County on the gulf coast and were distributed evenly along the Atlantic coast (Fig. 2).

The 2005 total landings of Atlantic thread herring were 22% lower than the average landings in the previous five years (2000-2004) and were 22% lower than the 1982-2005 historical average landings (Fig. 2). On the gulf coast, total annual landings increased from 300,000 pounds in 1982 to about 5.0 million pounds in 1994, an increase that reflected the market demand and the expansion of this fishery in the early 1990s. Following the passage of Amendment 3 in 1995, landings declined; currently, annual landings fluctuate within the range of 2.1 to 3.1 million pounds (Fig. 3). Total annual landings of Atlantic thread herring on the Atlantic coast, which averaged about 760,000 pounds during 1997-1999, have dropped to only about 128,000 pounds in 2005 (Fig. 3).

Commercial purse seine catch rates are variable on the Atlantic coast, with higher but less precise estimates from 2002-2005 (Fig. 4). On the gulf coast, catch rates have generally increased throughout the time series with extremely high rates in 2004 and 2005 (Fig. 5). Since hold capacity of the purse seine boats (30,000-40,000 pounds) is occasionally met, commercial catch rates may not reflect the abundance or availability of Atlantic thread herring (B. Mahmoudi, FWC-FWRI, pers. comm.). The recreational catch rate estimates are imprecise and have fluctuated without trend on both coasts.

Annual standardized estimates of young-of-the-year (YOY) Atlantic thread herring catch rates show a period of increasing recruitment from 1998-2002, a decline in recruitment on the Atlantic coast in 2003, high recruitment in 2004, and low recruitment in 2005 (Fig. 6). On the gulf coast, indices of YOY Atlantic thread herring abundance were generally low from 2000-2003, but rebounded slightly in 2004 and 2005 (Fig. 7). Post-YOY abundances of Atlantic thread herring fluctuated without trend on the Atlantic coast and fluctuated with out trend from 1996-1999, followed by a sharp decline in 2000, after which abundance have been increasing steadily through 2005 (Figs. 8,9). There were no instances of gross external abnormalities among Atlantic thread herring on the Atlantic coast, although on the gulf coast occurrences were highest in 1999 and 2001 (Fig. 10). Parasites and ulcers/lesions were the most common gross external abnormality of Atlantic thread herring on the gulf coast (Fig. 11).

No formal stock assessment of Atlantic thread herring is available at this time. Despite significant reductions in Florida's west coast commercial landings since 1995, the analysis of fishery-independent trawl-acoustic surveys (1994-2003) indicated no increase in the abundance of important baitfish species (i.e., Spanish sardine, round scad, and Atlantic thread herring) in recent years (Mahmoudi *et al.* 2002, B. Mahmoudi FWC-FWRI, pers. comm.). Mean trawl catch rates for Atlantic thread herring catch rates varied without trend. Catch rates were lowest in 2001. These findings suggest that factors other than fishing may have caused changes in population abundance of Atlantic thread herring in the survey area. A multivariate ANOVA model, relating acoustic baitfish density and environmental variables, indicated that the baitfish density significantly increased in waters with lower salinities and lower temperatures. These relationships may explain reasons for low baitfish trawl catch rates in 1997, 2001, and 2002 when the salinity was at its maximum range (Mahmoudi *et al.* 1999).

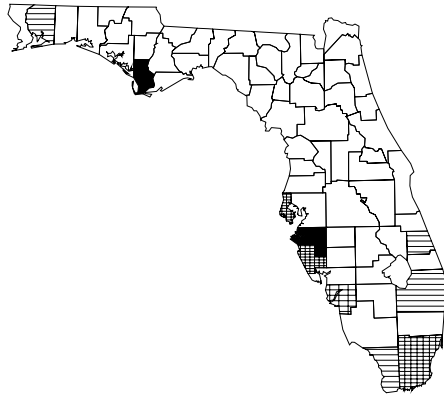


Figure 1. Geographic distribution of commercial landings of thread herring during 2005

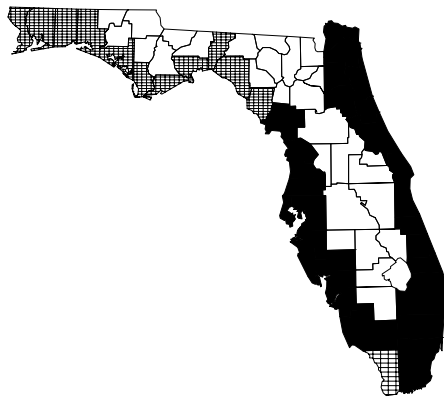


Figure 2. Geographic distribution of recreational landings of thread herring during 2005

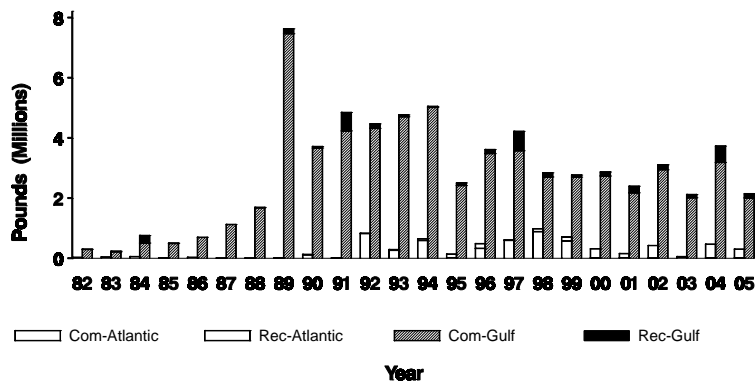


Figure 3. Total annual landings of Atlantic thread herring on the Atlantic and gulf coasts of Florida, 1982–2003

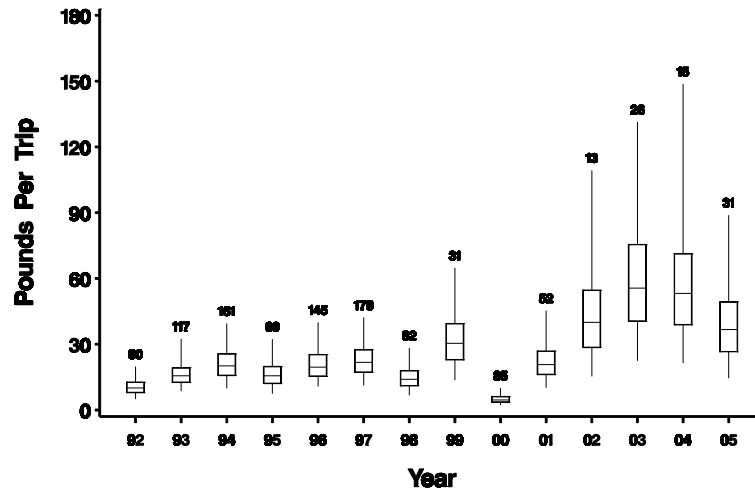


Figure 4. Annual standardized commercial purse seine catch rates (pounds) for Atlantic thread herring on the Atlantic coast of Florida, 1992–2005

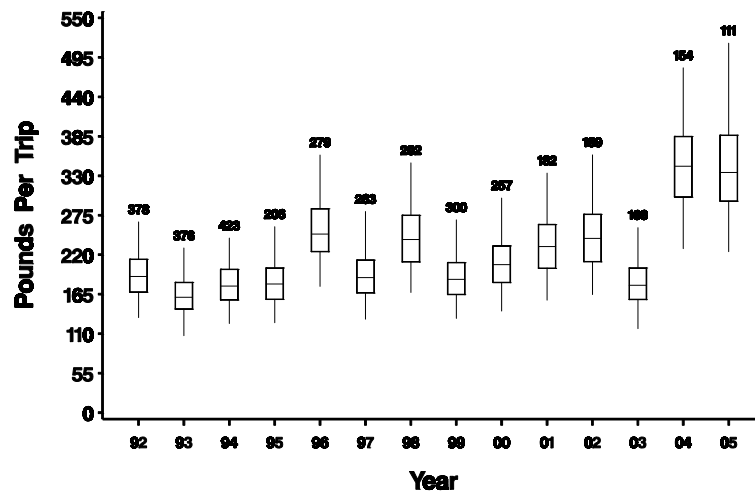
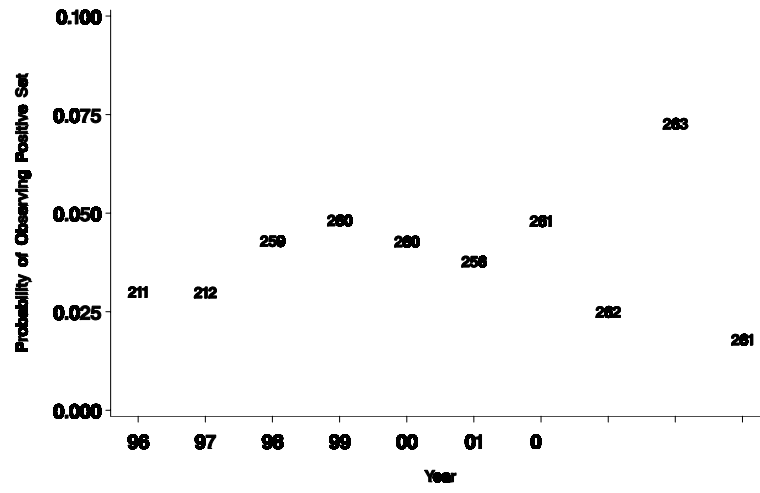


Figure 5. Annual standardized commercial purse seine catch rates (pounds) for Atlantic thread herring on the gulf coast of Florida, 1992–2005



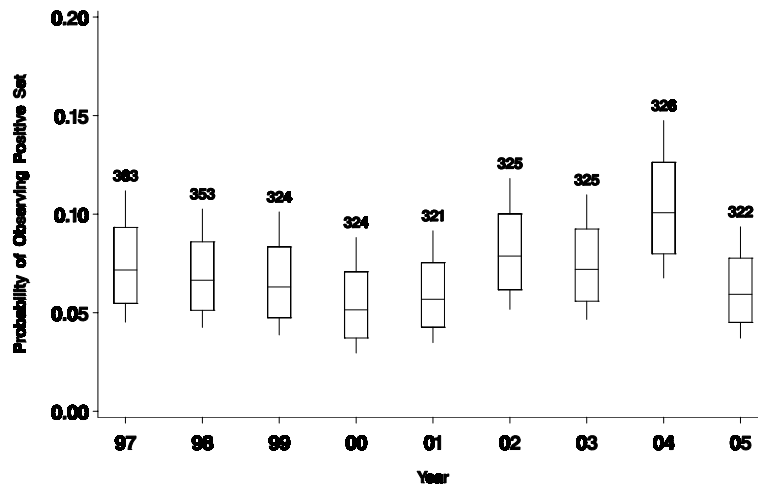


Figure 8. Proportion of fishery-independent-monitoring sets on the Atlantic coast that captured post-young-of-the-year Atlantic thread herring, 1997-2005

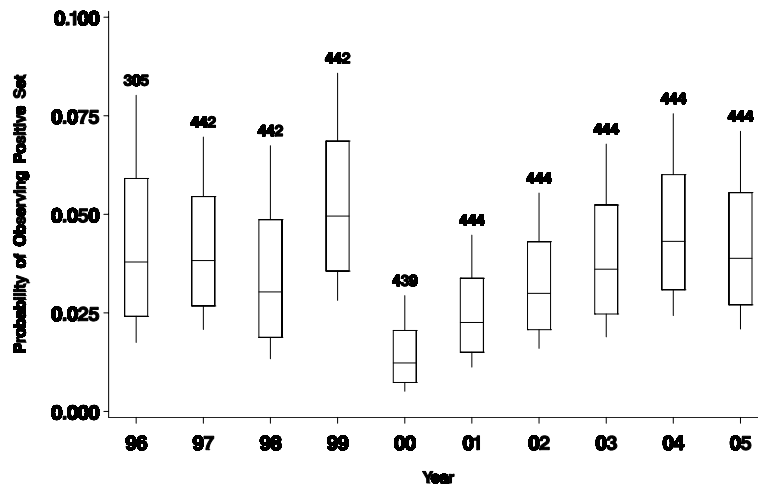


Figure 9. Proportion of fishery-independent-monitoring sets on the gulf coast that captured post-young-of-the-year Atlantic thread herring, 1996-2005

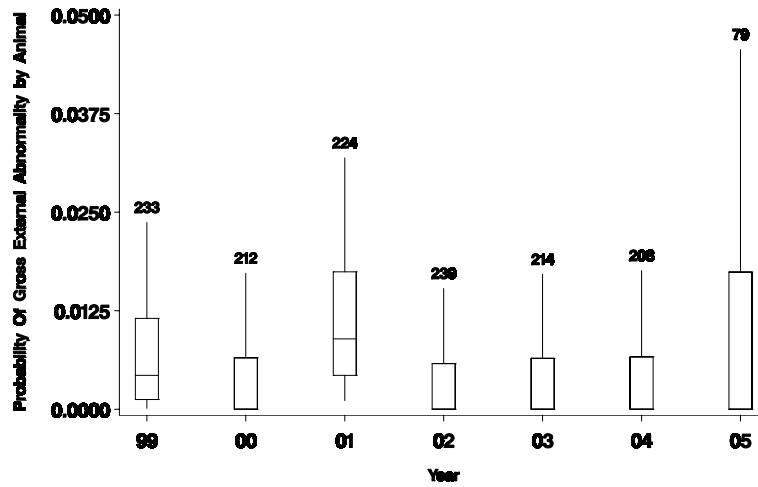


Figure 10. Proportion of Atlantic thread herring ≥ 75 mm collected in fishery-independent-monitoring sets on the gulf coast that had gross external abnormalities, 1999-2005

Percentage of gross external abnormalities

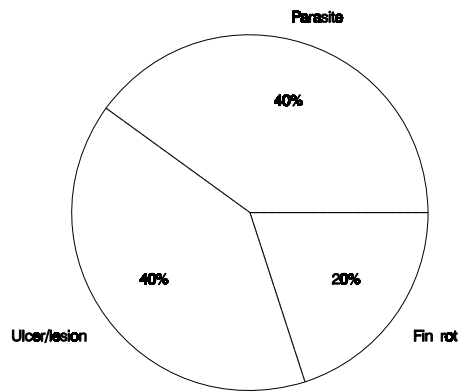


Figure 11. Proportions of different gross external abnormalities in Atlantic thread herring ≥ 75 mm collected in fishery-independent-monitoring sets on the gulf coast, 1999-2005