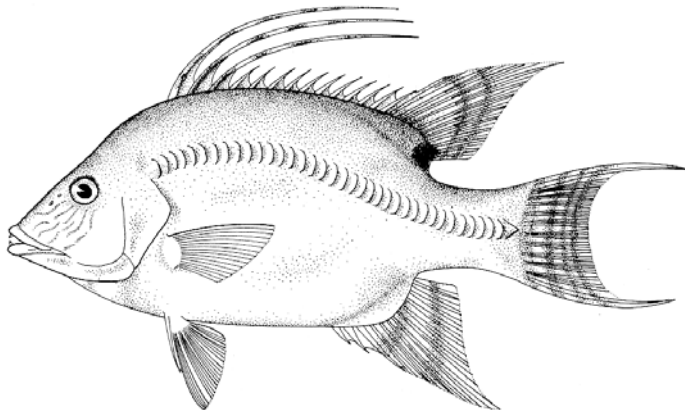


Hogfish, *Lachnolaimus maximus*



Hogfish are large wrasses (family Labridae) that inhabit areas of moderate-high relief in shelf waters from North Carolina south throughout the Caribbean Sea to the northern coast of South America. Juveniles can be found in shallow seagrass beds in Florida Bay (Tabb and Manning 1961). Mature hogfish have sex-specific coloration and are protogynous hermaphrodites, i.e., they begin life as females then change to males (Davis 1976). Ages of hogfish have not been validated but scale marks seem to indicate that females reach 3 years old and about 14.2" long before they change to males (Davis 1976). Males get as large as 27.6" fork length (FL), and marks seen on the urohyal (gill arch bone) suggest a maximum age of 11 years (Claro *et al.* 1989). Females first mature to spawn at 7.9" FL. Males transform from females and are able to first spawn at 10.2–11.8" FL (Davis 1976). Peak spawning occurs during February and March in south Florida and may vary due to a narrow temperature requirement, 24°C–27 °C (Colin 1982).

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

Inches FL = $L_{\infty}(1-e^{-K(\text{age}-t_0)})$	K	L_{∞} (inches FL)	t_0 (years)	Source
Combined sexes, southwest Cuba	0.098	33.5	-1.38	Corrected from Claro <i>et al.</i> (1989)

Weight in lbs = $a(\text{inches FL})^b$	a	b	Source
Combined sexes, southern Florida	0.000747	2.988	Bohnsack and Harper (1988)

Juvenile hogfish are reported to feed on benthic crustaceans, mollusks, and echinoderms (Sierra *et al* 1994; Randall 1967). Adults consume bivalves, gastropods, sea urchin, crabs, and other mollusks (Sierra *et al* 1994; Randall 1967). Adult hogfish feed mostly by winnowing hard shelled animals from the bottom substrate and crushing their prey with their pharyngeal jaws (Clifton and Motta 1998).

Florida landings of hogfish totaled 181,792 pounds in 2005. The recreational fishery accounted for 82% of the total statewide landings that year. Seventy-one percent of the statewide landings in 2005 were made on the gulf coast. Commercial landings were highest in Dade County on the Atlantic coast and Monroe and Pasco Counties on the gulf coast (Fig. 1). Recreational landings were highest in the southeast regions of Florida on the Atlantic Coast, and evenly distributed along the gulf coast (Fig. 2). Landings made in the Big Bend region of the

gulf coast probably come from catches made on or near the Florida Middle Grounds in the eastern Gulf of Mexico. The 2005 total landings were 13% lower than the average landings in the previous five years (2000-2004) and were 42% lower than the historical average landings (1982–2005). Atlantic coast landings of hogfish increased steadily between 1990 and 1995 then generally fluctuated between years of high landings (80,000 pounds) and low landings (40,000 pounds) through 2005 (Fig. 3). On the gulf coast, annual hogfish landings decline rapidly between 1992 and 2000, followed by a slight increase through 2005 (Fig. 3). More recently annual landings on the gulf coast have averaged about 160,000 pounds. The 1984 high value estimated for hogfish landings on the gulf coast is probably an indication of the degree of variability in the early recreational catch estimates that used small sample sizes. In fact, the aberrantly high landings estimate was the result of two angler interviews that recorded catch-rates of 100 hogfish per trip. Early estimates of recreational harvest are quite imprecise for hogfish, partly because few hogfish anglers were interviewed during any given year.

Commercial catch rates on the Atlantic coast declined between 1996 and 2000 and have held steady through 2005 (Fig. 4). Catch rates for commercial fishers on the gulf coast has remained at a relatively stable level throughout the period examined, 1992-2005 (Fig. 5). Hogfish are not caught efficiently using hook-and-line gear so angler catch rates are of limited value in estimated changes in relative abundance. The observed recreational catch rates have fluctuated on both coasts with no apparent trends (Figs. 6, 7).

The latest stock assessment (SEDAR and SAFMC 2004b) indicated that hogfish was severely overfished (both growth and recruitment) and has been for the last two decades in Florida waters. The estimated total fishing mortality rate for 2001 was $F=0.57$, which is four times greater than $F_{MSY} = 0.13$. The peer-review of this assessment found that there was qualitative evidence suggesting that hogfish were growth overfished but insufficient evidence to determine the status of the stock (SEDAR and SAFMC 2004b). McBride and Murphy (2003) examined the status of the hogfish fishery, particularly in reference to the effect of the 1994 minimum-size regulation on hogfish landings in Florida, and explored some costs and benefits of increasing the minimum legal fish size to increase the yield-per-recruit of hogfish. Results from this study indicated that, until 2000, the sizes of most hogfish landed in Florida were very similar to the 12-inch (305mm) FL size limit. Hogfish at this size are predicted to be age-3, but this species grows to 824 mm (32.4 inches) FL and reaches age-25. The observed maximum size is lower in south Florida, where mortality is greatest, suggesting that growth overfishing is occurring in this region. The yield-per-recruit analysis conducted by McBride and Murphy (2003) indicated that maximum yield-per-recruit for hogfish would occur at a size larger than the current mean size of fish harvested.

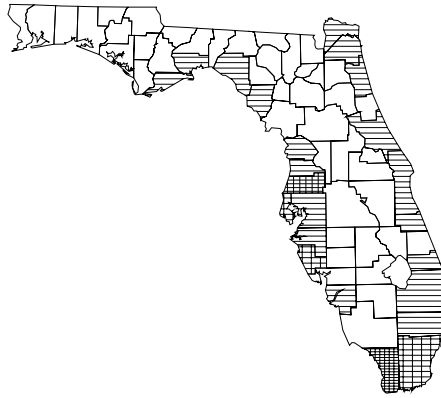


Figure 1. Geographic distribution of commercial landings of hogfish during 2005

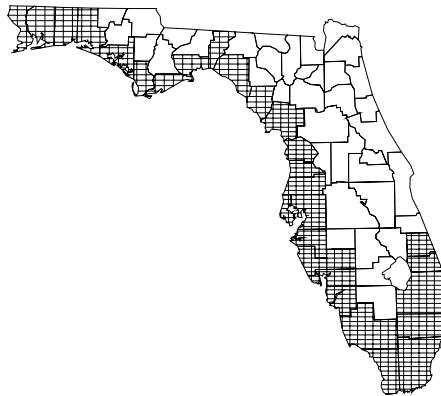


Figure 2. Geographic distribution of recreational landings of hogfish during 2005

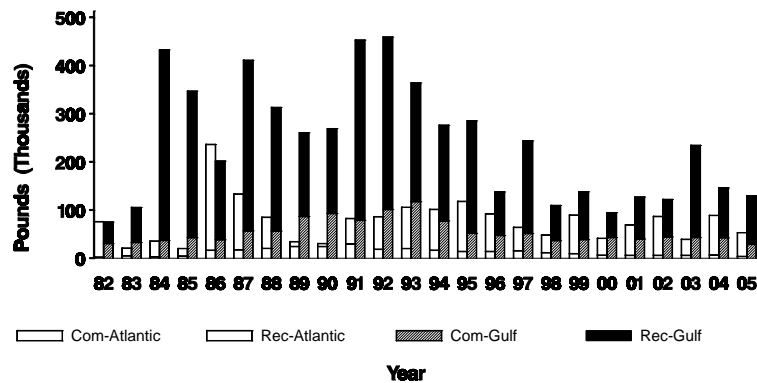


Figure 3. Total annual landings of hogfish on the Atlantic and gulf coasts, 1982–2005

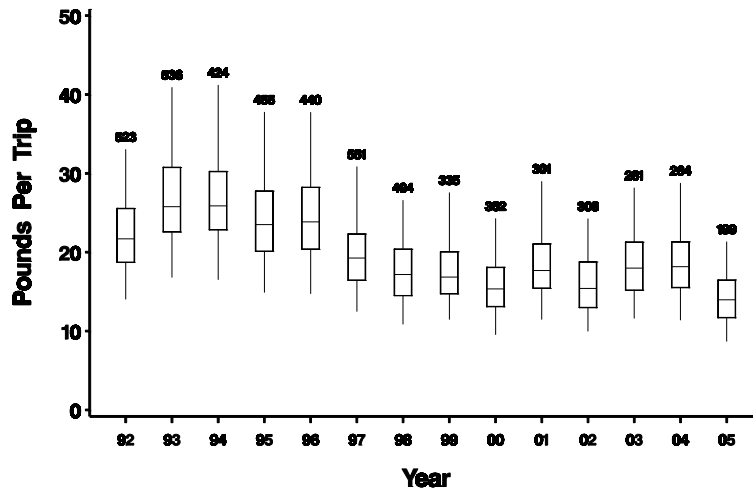


Figure 4. Annual standardized commercial catch rates (pounds) for hogfish on the Atlantic coast of Florida, 1992–2005

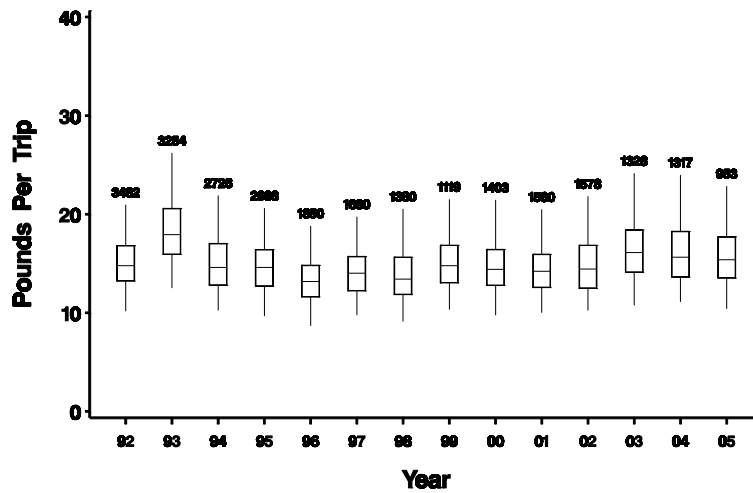


Figure 5. Annual standardized commercial catch rates (pounds) for hogfish on the gulf coast of Florida, 1992–2005

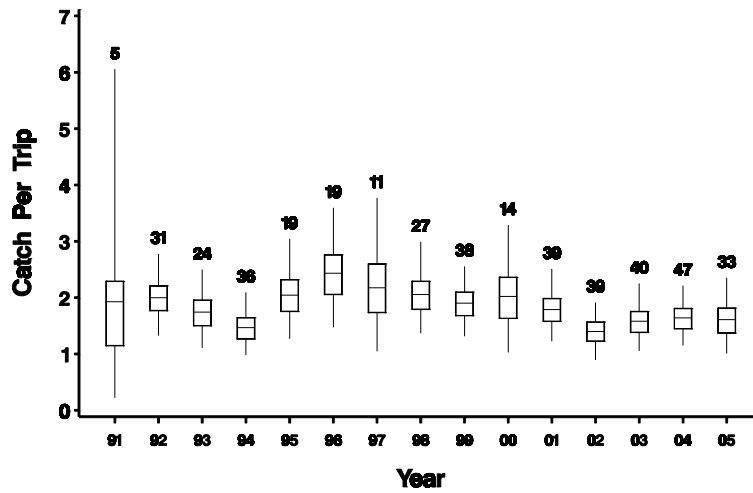


Figure 6. Annual standardized recreational total-catch rates (numbers) for hogfish on the Atlantic coast of Florida, 1991–2005

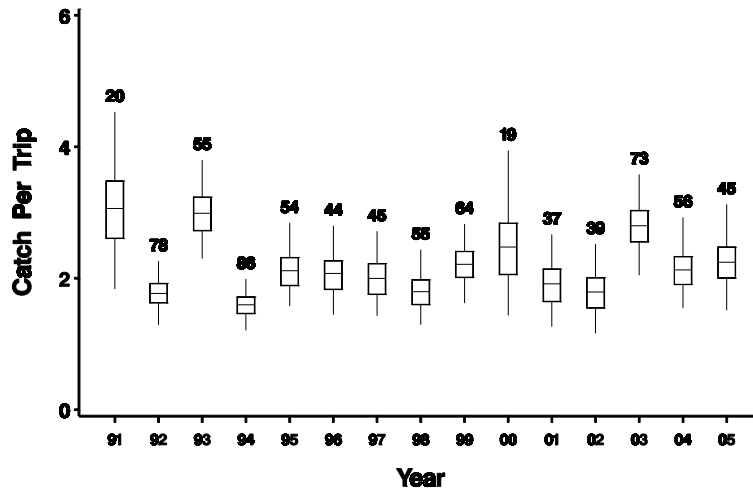


Figure 7. Annual standardized recreational total-catch rates (numbers) for hogfish on the gulf coast of Florida, 1991–2005