Atlantic, Gulf of Mexico, and Caribbean Reef Fisheries

Unit 8

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INTRODUCTION

Reef fish include more than 100 species that prefer coral reefs, artificial structures, or other hard bottom areas, and tilefishes that prefer muddy bottom areas. They range along the coast to a depth of about 200 m, from Cape Hatteras, N.C., through the Gulf of Mexico and the Caribbean Sea. Reef fish fisheries are extremely diverse, have many users (commercial, artisanal, recreational, and scientific), and vary greatly by location and species. Anglers fish for food, commerce, sport, and trophies. They operate from charterboats, headboats, private boats, and shore while using fish traps, hook and line, longlines, spears, trammel nets, bang sticks, and barrier nets.

Reef fish fisheries are associated closely with fisheries for other reef animals including spiny lobster, conch, stone crab, corals, and living rock and ornamental aquarium species. Nonconsumptive uses of reef resources (e.g. ecotourism, sport diving, education, and scientific research) also are economically important and can conflict with traditional commercial and recreational fisheries. Although reef fish have been caught for generations, good statistical data for most areas began to accrue in the late 1970's when recreational fishing surveys were started. Fishery data collection remains difficult because there are diverse users, and landings are made at many ports. Fishing pressure has increased with growing human populations, greater demands for fishery products, and technological improvements, such as longlines, wire fish traps, electronic fish finders, and navigational aids.

Reef fish fisheries vary widely by area. In most cases, the current and long-term potential yields are unknown, though for many species they are probably higher than present recent average yields would indicate (Table 8-1). Data are often not available by species, fishery component, or area. Statistics are confounded because species are not further identified into market categories (i.e. groupers, snappers, grunts). The reef fish management unit includes about 100 species (excluding those for the marine aquarium trade). In the Southeast Region, reef fish fisheries occurring in the 200-mile U.S. zone are managed by the South Atlantic Fishery Management Council, the Gulf of Mexico Fishery Management Council, and the Caribbean Fishery Management Council. The 3-mile territorial waters are managed by eight coastal states, the U.S. Virgin Islands, and the Commonwealth of Puerto Rico.

In the Gulf of Mexico, the Reef Fish Fishery Management Plan prohibits the use of fish traps, roller trawls, and powerheads on spearguns within an inshore stressed area; places a 38 cm (15-inch) total length minimum size limit on red snapper; and imposes data reporting requirements. A 20% spawning potential ratio was established as a basis to measure overfishing. Presently, there is a 4-fish recreational bag limit for red snapper, and the commercial catch is limited by an annual quota. For grouper, a 5-fish recreational bag limit and 4,455 metric ton (t) shallow-water and 727 t deep-water commercial quotas were established. Other regulations included a ban on the harvest of jewfish, a framework procedure for establishing total allowable catches and allowing the target date for rebuilding to be changed depending on scientific information, and a revised target year of 2019 for

Table 8-1

Productivity in metric tons and status of Atlantic, Gulf of Mexico, and Carribean reef fish fisheries.

Area and species	Recent average yield (RAY)[2]	Current potential yield (CPY)[1]	Long-term potential yield (LTPY)[1]	Fishery utilization level	Stock level relative to LTPY
Gulf of Mexico					
Red snapper	3,815	2,722	15,000	Over	Below
Red grouper	3,322	Unknown	Unknown	Full	Near
Nassau grouper and jewfish[3]	2	0	Unknown	Over	Below
Shallow groupers (7 species)	2,197	Unknown	Unknown	Over	Unknown
Other groupers (5 species)	575	Unknown	Unknown	Unknown	Unknown
Other snappers (13 species)	3,479	Unknown	Unknown	Unknown	Unknown
Porgies (6 species)	125	Unknown	Unknown	Unknown	Unknown
Amberjacks (2 species)	1,462	Unknown	Unknown	Unknown	Unknown
Grunts (3 species)	1,358	Unknown	Unknown	Unknown	Unknown
Sea basses (3 species)	364	Unknown	Unknown	Unknown	Unknown
Others (14 species)	1,000	Unknown	Unknown	Unknown	Unknown
Atlantic					
Wreckfish	349	Unknown	Unknown	Full	Near
Vermillion snapper	564	Unknown	Unknown	Over	Below
Red snapper	155	Unknown	Unknown	Over	Below
Red porgy	236	Unknown	450	Over	Below
Nassau grouper and jewfish[3]	1	0	Unknown	Over	Below
Other groupers (16 species)	1,150	Unknown	Unknown	Over	Below
Sea basses (3 species)	751	Unknown	Unknown	Full[4]	Near
Other snappers (11 species)	652	Unknown	Unknown	Over	Below
Amberjacks (2 species)	1,078	Unknown	Unknown	Under	Unknown
Other porgies (8 species)	67	Unknown	Unknown	Unknown	Unknown
Grunts (11 species)	354	Unknown	Unknown	Unknown	Unknown
Others	1,662	Unknown	Unknown	Unknown	Unknown
Caribbean					
Nassau grouper	4	Unknown	Unknown	Over	Below
Snappers (10 species)	422	Unknown	Unknown	Unknown	Unknown
Other groupers (6 species)	61	Unknown	Unknown	Unknown	Unknown
Grunts (5 species)	70	Unknown	Unknown	Unknown	Unknown
Others (50 species)	462	Unknown	Unknown	Unknown	Unknown
Total	25,737	24,641	37,136		

[1]LTPY is probably greatly underestimated and CPY overestimated; although potential production estimates are not available for most species groups, many are probably overutilized.

[2]1989–91 average.

[3]A total fishing prohibition has been imposed or is being considered.

[4]Approaching full utilization level.

rebuilding the red snapper stock. In 1992, a moratorium was established to stop issuing new commercial reef fish permits.

In the southern U.S. Atlantic, the Snapper-Grouper Fishery Management Plan emphasizes minimum size limits, bag limits, and commercial quotas. Seasonal closures exist, and the taking of jewfish and Nassau grouper are prohibited. Various gears are restricted, including a prohibition of roller trawls and fish traps (except sea bass traps). Certain commercial fishing methods are prohibited in designated special management zones around some artificial reefs. An individual transferable quota system has been established for commercial wreckfish fishermen which is based on historic catch. It provides fishermen with a quota that can be taken any time during the season or bartered or sold to another fisherman.

In the U.S. Caribbean, the Fishery Management Plan for the Shallow Water Reef Fish Fish-

ery of Puerto Rico established regulations to rebuild declining reef fish stocks in the exclusive economic zone and reduce conflicts among fishermen. It established criteria for the construction of fish traps, required owner identification and marking of gear and boats; prohibited hauling or tampering with another person's traps without the owner's written consent; prohibited the use of poisons, drugs, other chemicals, and explosives for the taking of reef fish; and established a minimum size limit on the harvest of yellowtail snapper and Nassau grouper. Additional regulatory amendments have been designed to protect and rebuild the stocks.

SPECIES AND STATUS

More than 100 reef fishes are important to commercial or sport fishermen (Table 8-1). While landings and value for individual species are not large, reef fishes overall produce significant landings and values (Figures 8-1, 8-2, and 8-3). Recent average commercial catches for the U.S. Atlantic and Gulf have been about 24,000 t with a dockside ex-vessel revenue of $48 million. Sport fishermen make more than 20 million angler-trips annually.

Reef fishes are vulnerable to overfishing owing to their long lives, slow growth, ease of capture, large body size, delayed reproduction, and other factors. Most are probably either fully utilized or overutilized (Table 8-1). Red snapper, traditionally the most important Gulf reef fish, is overutilized in part as a result of its incidental catch by the shrimp fishery. Eight of the ten major species in the Atlantic headboat fishery show significant size declines since 1972. In the Caribbean, such traditional fishery mainstays as Nassau grouper have practically disappeared, and total landings of species of more recent importance like the red hind have declined since the late 1970's. Landings of amberjack, lane snapper, vermilion snapper, and similar species have increased as catches of traditional species have declined.

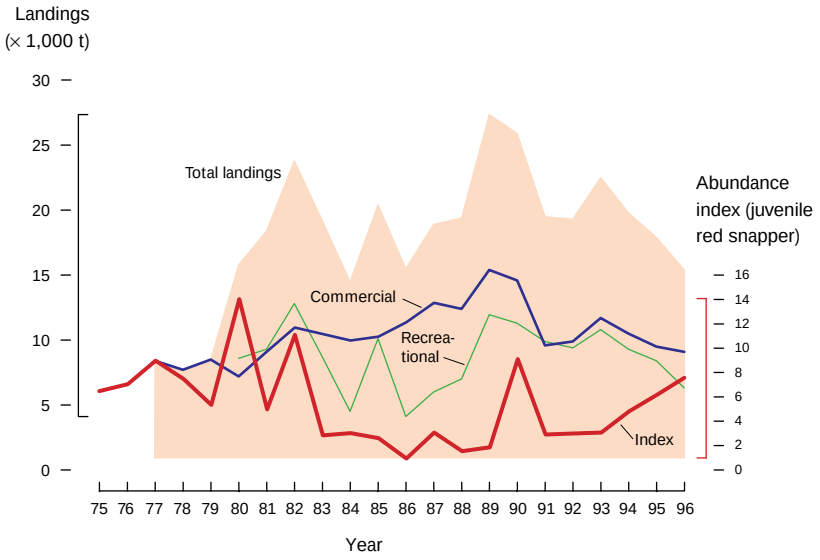

Figure 8-1
Gulf of Mexico reef fish landings, 1975–97, in metric tons (t). The abundance index is a relative value showing fish per standarized haul.

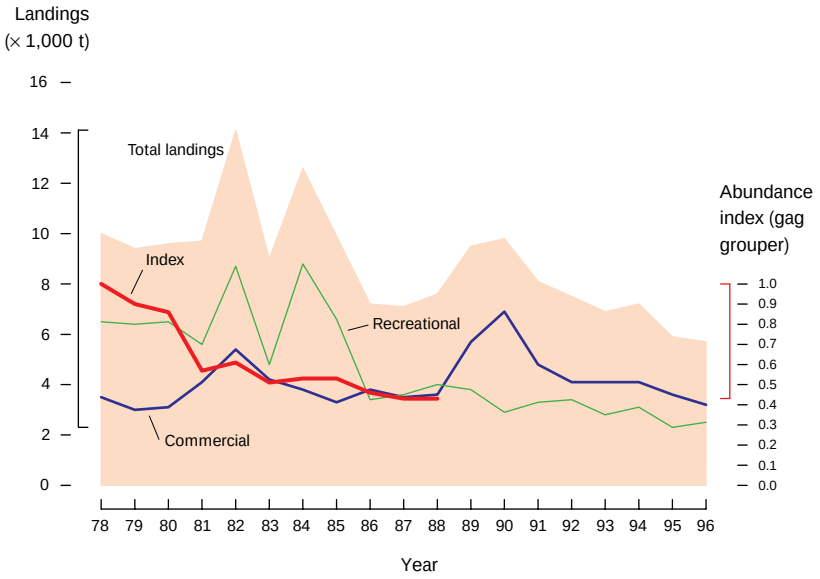

Figure 8-2
U.S. Atlantic Coast reef fish landings, 1978–97, in metric tons (t). The abundance index is a relative value showing fish per standarized haul.

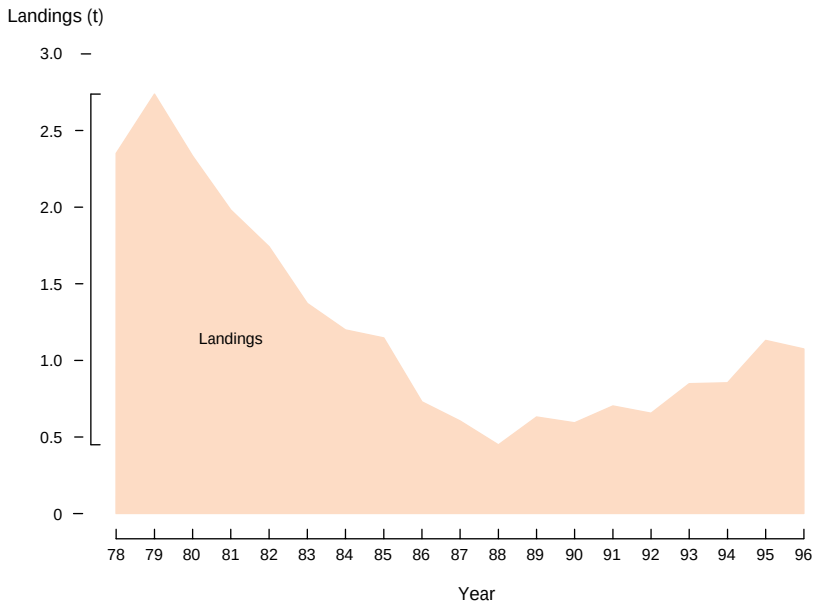

Figure 8-3
Carribean waters reef fish landings, 1978–97, in metric tons (t).

ISSUES

Bycatch and Multispecies Interactions

Reef fish form a complex, diverse multi-species system. The long-term harvesting effects on reefs are not well understood, requiring cautious management controls of targeted fisheries as well as bycatch. Removals of apex predators from the reef complex may result in shifts of species composition. Major bycatch issues currently occur with the capture and discarding of red snapper by vessels fishing for shrimp with small-mesh nets. This bycatch problem means that, in order to meet the rebuilding goals for the stock, targeted harvests must be even more restricted. Bycatch of other species may pose similar difficulties as will the capture of undersized fish, even if they are released. The mortality rate of released fish is not well known.

Scientific Information and Adequacy of Stock Assessments

Several stocks of reef fish are currently depleted and need to be rebuilt (e.g. jewfish and Nassau grouper). A variety of management measures need to be explored, including the use of artificial reefs and the effectiveness of marine parks and reserves to protect spawning areas.

There are a number of important scientific issues which need to be addressed to improve the advice for management. The long-term potential yields for most of the reef fish species is unknown. Data on catch and the identification of species are inadequate for many stocks. They should be collected on a routine basis. Additional life history and biological data are needed to better understand this complex of species.

Allocation

Reef fish resources are utilized by a wide range of groups. Commercial and recreational fishermen may come into conflict with one another as well as with other users such as ecotourists. Balancing the interests of these groups is an important management issue.

Progress

An individual transferable quota system was implemented for wreckfish in April 1992. Since then, the shares are generally holding their value and fish prices have improved.

FOR FURTHER READING

Goodyear, C. P. 1995. Red snapper in U.S. waters of the Gulf of Mexico. National Marine Fisheries Service, Southeast Fisheries Science Center, Miami, Florida, MIA-95/96-05.

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