

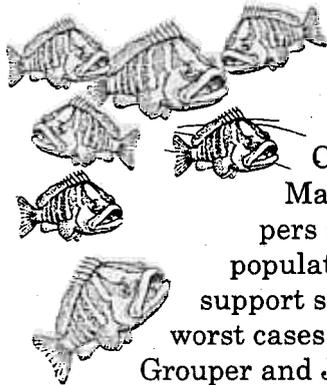
# TROPIC NEWS

DEPARTMENT OF PLANNING AND NATURAL RESOURCES DIVISION OF FISH AND WILDLIFE RESOURCES

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## Spawning Aggregations



There is no question that many reef fish stocks in the U.S. South Atlantic, Gulf of Mexico, and Caribbean are in trouble.

Many snappers and groupers are overfished, with population levels too low to support sustainable fisheries. In worst cases, such as with Nassau Grouper and Jewfish, fishing for these species is prohibited.

One of the factors that makes many reef fish susceptible to overfishing is their mating habits. Many of these fish form mass spawning aggregations, where hundreds or even thousands of fish convene at a specific time and place for the purpose of reproducing. Gathering from miles around, members of these aggregations will remain together for days, periodically engaging in group courtship rituals. These rituals may culminate in mad group dashes to the surface, during which white clouds of sperm and eggs are released to mix and join in the water column to produce new offspring. There's reason to believe that this spawning aggregation behavior maximizes the chances of reproductive success for many reef fish. Unfortunately, it also maximizes their vulnerability to both commercial fishermen and recreational anglers, who target these spawning aggregations.

Fishermen have historically targeted these spawning aggregations, with devastating results. Many spawning aggregations have been literally fished out of existence, while others are only a fraction of their former size.

The coral reefs and coral hardbottoms around the world harbor hundreds of harvested fish species. These fish support fleets of both commercial and recreational boats, are essential

for large numbers of jobs, and generate many billions of dollars in economic activity. They are the basic capital asset of a significant industry.

Researchers have found that some of the most intensive fishing pressure on reef fish populations occurs over spawning aggregations. Studies in the South Atlantic have shown that disproportionately large percentages of total annual landings for mutton snapper, gray snapper, yellowtail snapper, gag grouper, and greater amberjack are taken during spawning season.

There is considerable evidence that unprotected spawning aggregation areas can and have been fished out of existence. Spawning aggregations have shown signs of overfishing in the Virgin Islands for at least 20 years. Several spawning aggregations on St. Croix have disappeared. Catches from spawning aggregations in Belize declined 81% over 10 years. The Western Dry Rocks spawning aggregation off Key West has never recovered from fishing decimation. And these are just a few examples.

In short, spawning members of overfished species are being killed at precisely the times when they would be of most value alive and actively contributing to the replenishment and restoration of the stocks.

## Fishery Management Issues

In the South Atlantic, Gulf of Mexico, and Caribbean regions of the United States, federally appointed fishery management councils have established fishery management plans for reef fish. In waters under state jurisdiction, various state governmental agencies enact, and revise, fishing rules.

But in spite of the efforts of these governmental bodies, many more reef fish species are in an overfished state now than ten years ago. And many of those overfished species are the same

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## Quote

The earth has been rotating in space for several billion years now. Yet it has been said that if the whole history of our planet could be condensed into one calendar year, man would not appear until 10:30pm on December 31. Isn't it strange that on the basis of such limited experience we have decided that the future is ours?

Steve Van Matre. 1990

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## Weather

February 1999 - Redhook, St. Thomas

Temperature

Maximum	Minimum	Rainfall
84.3 °F	65.4 °F	0.45 inches

reef fish species routinely targeted in spawning aggregations.

Fishery managers are realizing that the use of more traditional tools, such as quotas, minimum sizes, and bag limits, are not sufficient to prevent overfishing or to rebuild overfished stocks. The protection of spawning aggregations offers fishery managers another tool to help maintain sustainable fisheries. As with other fishery management tools, spawning aggregation protection may not, by itself, be the answer to complex fishery problems. However, when used in conjunction with other management measures, the protection of these vulnerable aggregations will allow an increase in reproductive success, eventually leading to an increase in fishing populations.

Recognizing the dangers faced by spawning aggregations, fishery managers have enacted protection for a number of these important assemblages. For example, sites where mutton snapper aggregate to spawn near the Dry Tortugas, Florida and St. Croix, USVI, are closed to all fishing during the spawning season. The harvest of jewfish is prohibited in United States federal waters and Florida and Virgin Islands territorial waters.

#### Criteria for Protection

For some species, spawning fish return to the same reef year after year at approximately the same time. For spawning aggregations that are fixed in location, the closure of these to fishing will be the best management choice to protect the spawning aggregations. The closure must be of sufficient size to allow for some movement of fish away from the center of the aggregation. The area must be closed for a sufficient time to allow for year to year variability in the arrival and departure of the aggregating fish.

The locations of spawning aggregations for other species may vary from year to year but the timing may be critical. For example, a species may aggregate at a number of different coral reefs from 30-40 m deep, but will always aggregate on the first full moon after the winter solstice. For these species, area closure may fail to protect much of the spawning aggregation. Temporal closure of the entire stock to fishing pressure may be a better choice for the fishery manager. The temporal closure should be sufficient to allow the fish to reach the aggregation sites, spawn, and disperse.

To best protect spawning aggregations, it is preferable to eliminate all fishing in and around the aggregate site. If fishing for other species is allowed, some of the spawning fish will be caught by fishers, but then must be released as "bycatch". Some of these released fish will die ("bycatch mortality"). Bycatch mortality can remove a large number of spawning fish. The only way to eliminate bycatch mortality is to prohibit all fishing in a given area.

Protection of spawning aggregations will only be true protection if the majority of people obey the regulation. Enforcement will generally be easier if all fishing is prohibited within a given area. Enforcement officials can then stop anyone who is seen fishing, rather than having to check the catch to determine if protected species are present.

This article has been excerpted from original prepared by Diane M. Rielinger for Reefkeeper International



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GOVERNMENT OF THE VIRGIN ISLANDS  
OF THE UNITED STATES

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