

An extensive deep reef terrace on the Tortugas Bank, Florida Keys National Marine Sanctuary

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In response to concerns about declining regional trends in reef fish stocks and coral reef habitat quality (Bohnsack et al. 1994; Ault et al. 1998), the Florida Keys National Marine Sanctuary, together with the US National Park Service, State of Florida, and the Gulf of Mexico Fishery Management Council, created two no-take marine reserves during 2000 totaling approximately 500 km² in area in the western region of the Florida Keys, known as the Dry Tortugas. To provide baseline assessments of benthic habitat distribution and reef fish assemblages, a multidisciplinary scientific team completed two cruises to the Dry Tortugas during 1999 and 2000, in which divers used non-destructive methods to sample 450 sites.

While most of the mapped area (137 km²) of the Tortugas Bank consists of low-relief hard-bottom (104.9 km² or 77%) and scattered, rocky outcrops (16.1 km² or 12%), a sizeable portion of the western rim or platform edge (24°42.30'N, 83°02.64'W) is a well-developed reef terrace community (see Fig. 1, top). The topography of the substratum is very complex, owing to the numerous undercuts and caverns, as well as mushroom-shaped and plating corals up to 2 m in height. Coral cover is high (26.3–28.3% among three sites visited) relative to offshore reefs in the Florida Keys and is dominated by *Montastraea faveolata*, *M. franksi*, *M. cavernosa*, and *Siderastrea siderea*. The terrace community is a deeper version (22–27 m) of the reef terraces near Loggerhead Key 15 km to the southeast in Dry Tortugas National Park (Davis 1982). Anecdotal observations suggested that the western edge of the Tortugas Bank, locally named Sherwood Forest because of the predominance of mushroom-shaped corals (see Fig. 1, below), was spatially extensive. Using a combination of side-scan sonar, diver surveys, and bathymetry data, we estimate that the reef terrace is approximately 13.9 km² or about 10% of the mapped area of the Tortugas Bank. The "discovery" of this area by our science team was clearly preceded by the knowledgeable and active fishers of the region.

Despite the remoteness of the Dry Tortugas relative to the Florida Keys, and the well-developed reef structure, preliminary data indicate evidence of overfishing by a general absence of large species and individuals among exploited species, especially grouper (Serranidae) and snapper (Lutjanidae). Also, surprisingly few shark and barracuda were observed, and there was evidence of shrimp trawl damage to hard-bottom habitat. Because remoteness does not guarantee protection, the implementation of marine reserves in this region holds promise for restoration of fish stocks and protection of one of the largest areas of well-developed and previously undescribed coral reefs in Florida.

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Fig. 1 Tortugas Bank



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Reef sites

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