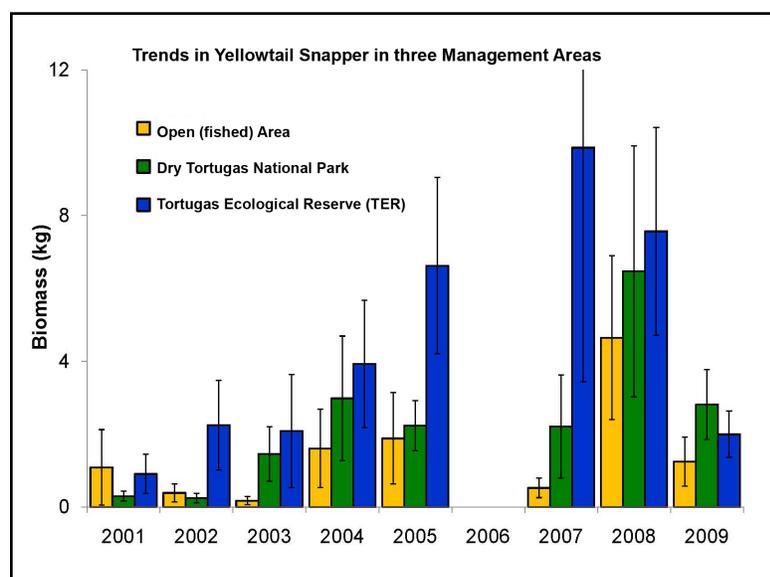


REEF FISH RESPOND POSITIVELY TO RESERVE PROTECTION

Research Project Description: In 2001, Tortugas Ecological Reserve (TER), a fully protected no-take zone, was implemented in the far western region of the Florida Keys National Marine Sanctuary. To monitor changes in reef fish populations associated with reserve protection, scientists conducted fish surveys in one section of the reserve, Tortugas North, from 2001 through 2009. Scientists tracked changes in fish abundance by measuring biomass, a measure of the amount of living fish. The study was conducted at the ecotone, or transitional zone, between the coral reefs of Tortugas Banks and the soft-bottom habitat on the surrounding shelf. While not apparent to the fish being surveyed, this ecotone falls under three different resource management regimes: the sanctuary's Tortugas North, which is closed to fishing; Dry Tortugas National Park, which until 2007 was open to recreational, but not commercial fishing; and a third area outside of the park and reserve open to both commercial and recreational fishing. In 2007, Dry Tortugas National Park's Research Natural Area was implemented, closing a portion of the park to both recreational and commercial fishing.

Research Results: Monitoring of reef fish populations over time showed that reef fish responded positively to the protection offered by TER. Biomass of yellowtail snapper, the dominant commercial species in the region, increased dramatically in TER during the first six years of protection, and then leveled off. In contrast, the biomass of yellowtail snapper remained low in the open fished area until 2008 when an increase was observed. The timing of this increase suggests it may have resulted from the buildup and spill-over of yellowtail production from the TER into the adjacent fished area. Other reef fish showed similar positive trends. Mutton snapper biomass increased in all three areas of the study, while hogfish biomass increased inside the TER and gray snapper biomass increased inside the national park.



Yellowtail snapper biomass increased within Tortugas Ecological Reserve (specifically Tortugas North) as compared to the open fished area. The cause of the dramatic decline in yellowtail snapper biomass observed in 2009 is not well understood, but likely resulted from broad scale ecological factors capable of influencing survival or distribution of fish across management regimes. Figure: NOAA Center for Coastal Fisheries and Habitat Research

Reference: John S. Burke, *et al.*, NOAA Center for Coastal Fisheries and Habitat Research

Impact of North Tortugas Ecological Reserve on the Fish Community.

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