PINK SHRIMP REBOUND IN ECOLOGICAL RESERVE

Research Project Description: The Tortugas region, located approximately 70 miles west of Key West in the Gulf of Mexico, has long supported a trawl fishery for pink shrimp. In 2001, Florida Keys National Marine Sanctuary implemented the Tortugas Ecological Reserve (TER), which consists of two sections: Tortugas North and Tortugas South. Tortugas North includes extensive soft-bottom areas on the shelf surrounding Tortugas Bank. Shrimp and other invertebrates living in the deep sediments of soft-bottom habitats are primary sources of food for a variety of reef fish that occupy the bank. The reserve's establishment closed the area to fishing, including shrimping, allowing scientists to study the effects of zone protection on shrimp and other marine life. To track shrimp populations, scientists compared pink shrimp biomass – or the amount of living matter – in trawl samples from inside Tortugas North, along the boundary of the reserve, and from the adjacent shelf area open to commercial trawling. Habitat structure and sediment characteristics of soft-bottom areas are thought to be affected by regular trawling for shrimp.

Research Results: Tortugas North appears to act as a refuge for the pink shrimp targeted by the shrimp fishery. In 2005, after four years of TER implementation, shrimp biomass was greater in the reserve than in the open fishing area. The boundary sampling area had intermediate shrimp biomass, demonstrating an expected gradient between full protection of the reserve and the fished area (see graph below). Since data collection did not begin until after reserve establishment, it is not certain if this gradient is due to spillover or migration from the reserve, or whether this gradient already existed. However, these data support the notion that soft-bottom communities appear to respond relatively quickly to the reduction of trawling pressure and that the abundance of pink shrimp, an important prey for fish, is relatively large within the reserve.

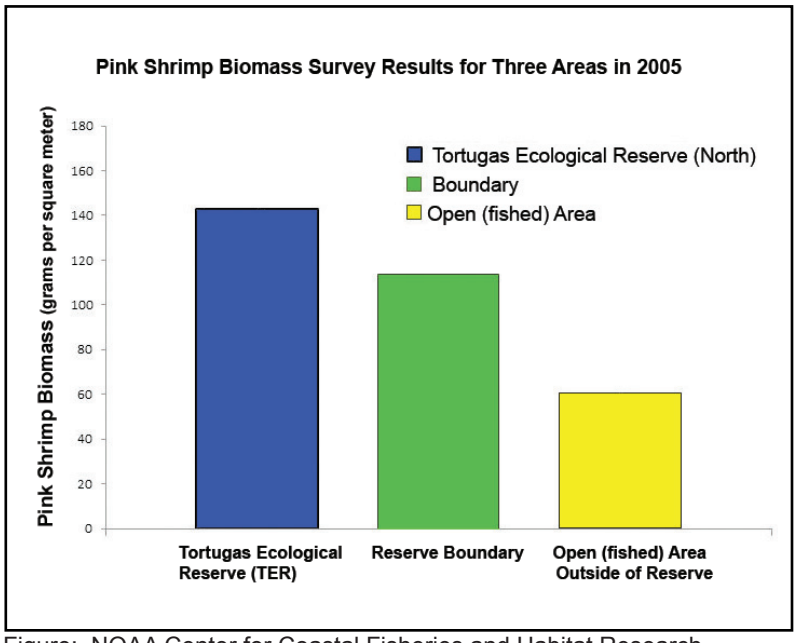

Figure: NOAA Center for Coastal Fisheries and Habitat Research

In 2005 after 4 years of protection, average biomass of pink shrimp was greatest in Tortugas Ecological Reserve (Tortugas North) and lowest outside the reserve in fished areas. Biomass was intermediate at the boundary between the reserve and fished areas. These results were consistent with what was expected with the cessation of trawling inside the reserve.

Reference: J. S. Burke *et al*., NOAA Center for Coastal Fisheries and Habitat Research. 2004.
Biogeographic Analysis of the Tortugas Ecological Reserve.
Marine Conservation Series MSD-04-1.