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## What are the Oculina Banks?

The Oculina Banks are a series of limestone ridges 17 miles off the east coast of Florida. The namesake of this area is *Oculina varicosa*, the ivory tree coral. The coral grows on ridges at depths of 230-300 feet and is a vital component of the Oculina Banks ecosystem. Because of its tree-like growth habit, *Oculina* forms coralline forests that provide food, shelter, and spawning grounds for a diverse group of fish and invertebrate species. The Oculina Banks are a breeding, feeding, and nursery ground for numerous mollusks and crustaceans, and at least 20 commercial fish stocks including snapper, gag, grouper, and porgy.

*Oculina* is delicate and slow-growing and therefore extremely vulnerable to pulverization by bottom trawl fishing gear. Each branch has the thickness of a pencil and the brittleness of a thin pretzel stick. A single coral colony may take over a century to grow three to five feet tall. Some very old *Oculina* forests have been reported to reach heights of 15 feet and stretch for hundreds of yards.

## What is being done to protect the banks?

### Protected Areas

The ecological importance of this unique coral habitat was legally recognized in 1984 when the South Atlantic Fisheries Management Council (SAFMC) designated a 92 nm<sup>2</sup> region as an *Oculina* Habitat Area of Particular Concern (OHAPC). The designation came with legal protections against the use of fishing gear that impacts the sea floor including trawls, dredges and fish traps. In 1994, the original OHAPC was renamed the Experimental *Oculina* Research Reserve (EORR) and all bottom fishing and anchoring was banned for 10 years. Six years later, the SAFMC expanded the OHAPC to 300 nm<sup>2</sup> and banned the use of all gears known to disrupt the habitat.

The EORR is a targeted solution to intense fishing pressures that have depleted economically important fish stocks. The protected area includes important habitat where species such as gag and scamp aggregate to spawn. Trawling during spawning periods removes large numbers of fertile individuals from the breeding population. Once depleted, the breeding population cannot replenish the stock, and fishery yields drop. By banning fishing in a major spawning aggregation habitat, the EORR protects fish such as these at one of the most vulnerable stages in their life cycles.

The efficacy of marine protected areas (MPAs) has been demonstrated repeatedly by the ability of exploited species to rebound within protected areas. Scientific surveys of the EORR bottom habitat were conducted in 1995—immediately after trawling was banned—and then in 2001. They indicate that more and larger groupers were present in 2001, after the EORR had been closed to bottom fishing for six years. Furthermore, scamp clearly associate with intact *Oculina* far more often than they do with dead or destroyed coral.

### Restoration Efforts

Coral restoration efforts have met with some success. Scientists have been able to graft healthy coral transplants to artificial substrate in areas where trawling has reduced coral to rubble. However, because the coral growth rate averages less than half an inch per year, full recovery will require decades if not centuries. Most of the *Oculina* habitat within the EORR has already been destroyed, making restoration a vital step in the process of protecting coral habitats. The regenerative success of coral transplants requires continued protection of the EORR.

### Enforcement of Protections

The EORR's integrity depends on the ability of enforcement authorities to deter commercial poaching. A 2001 survey of the reserve indicated that 90% of the *Oculina* habitat has been reduced to rubble. Although some of this damage may be attributable to natural causes, evidence implicating trawlers includes trawl tracks, arrests of poaching trawl fishermen, and lost and broken experimental coral transplants in protected areas. Trawling and all forms of bottom fishing have been banned in the OHAPC since 1984 and 1994, respectively, yet evidence indicates that trawling occurred as recently as 1994 and bottom fishing as late as 1997. In order to enhance current aerial and surface surveillance efforts, vessel monitoring systems (VMS) are now required on all boats in the calico scallop fleet that fishes near the EORR. The system allows authorities to track vessel movements relative to the boundaries of the protected area. Currently, VMS is used in combination with random surveillance missions and educational programs for commercial and recreational fishers.

### **What is being done to protect other deep-sea corals?**

The creation of the *Oculina* research reserve reflects a general trend towards place-based marine management. However, most deep-sea coral habitats are not protected and there is mounting evidence that human activities are causing unprecedented damage to coral communities on continental plateaus and slopes, and on seamounts and mid-ocean ridges. Just as scientists have begun to understand the diversity, importance, and vulnerability of deep-sea coral forests, humans have developed technologies that profoundly damage them.