

MARINE DEBRIS IN REEF HABITATS

FLORIDA KEYS NATIONAL MARINE SANCTUARY

Lost Fishing Gear is Common in Sanctuary Waters

Marine debris is one of the most widespread and persistent forms of pollution affecting the world's ocean and coastal waters. Plastics, lost fishing gear, derelict vessels and other marine debris can find its way into even the most remote ocean waters where it can harm marine life. While most debris originates from activities taking place at sea, coastal communities also contribute significantly to this global threat. In the Florida Keys, where recreational and commercial fisheries have existed for over 100 years, lost fishing gear and other marine debris have accumulated on the seafloor. Lost or abandoned fishing gear and other trash entangles and harms stony corals, sea fans, sponges, sea turtles, manatees and other marine life. It also degrades seagrass, hard-bottom, coral reef and mangrove habitats and detracts from the natural beauty of the islands. For these and other reasons, citizens and resource managers of the Florida Keys National Marine Sanctuary are concerned about the environmental impacts of all marine debris.

Scientists Document Prevalence of Marine Debris

Coral researchers from Nova Southeastern University (NSU) Oceanographic Center (formerly with University of North Carolina Wilmington) began conducting Keys-wide surveys of marine debris in 2000 during their assessments of corals, sponges and other benthic (bottom-dwelling) marine life. Since then, debris data have been recorded in 2008, 2010-11, and 2012. The 2012 surveys were conducted in collaboration with scientists from the sanctuary, National Park Service and Florida Fish and Wildlife Conservation Commission and included 600 coral reef and hard-bottom sites from Biscayne National Park to Key West.

This long-term study has documented the widespread and damaging impacts of marine debris in sanctuary waters. In 2012, more than 1,000 debris items were recorded at survey sites whose area totaled about nine acres. Marine debris was present at 64% of the 600 study sites. Debris recovered from the seafloor weighed 1,000 pounds and included 2,027 feet of fishing line and 6,561 feet of lobster and crab trap line.

To inventory marine debris, science divers swam along a 50 foot transect tape placed on the seafloor at each survey site and recorded the debris items found within 3.3 feet on either side of the tape. They noted when debris was causing tissue damage to corals, sea fans or other benthic organisms from either entanglement or abrasion. Whenever removing debris would not cause additional harm, it was retrieved and weighed. The lengths of monofilament line, leaders and wire, as well as lobster and crab trap line, were measured. The sampling design made it possible to compare the prevalence and amount of debris among habitats and inside and outside of sanctuary protected zones (Sanctuary Preservation Areas (SPAs), Research-only Areas and Ecological Reserves).

Patch Reefs are Laden with More Debris than Other Reef Habitats

Similar to previous survey years, in 2012 hook-and-line angling gear was the most frequent type of debris recorded, making up 45% of the total number of items. Angling gear consisted of monofilament line, hooks, wire leaders and lead sinkers. This type of gear was found in all habitats surveyed and in nearly all of the sanctuary protected zones where fishing is prohibited. Angling gear was particularly prevalent on patch reef habitat, being found on 48% of inshore and mid-channel patch reefs including those in Western Sambo Ecological Reserve, Hen and Chickens SPA and Cheeca Rocks SPA.



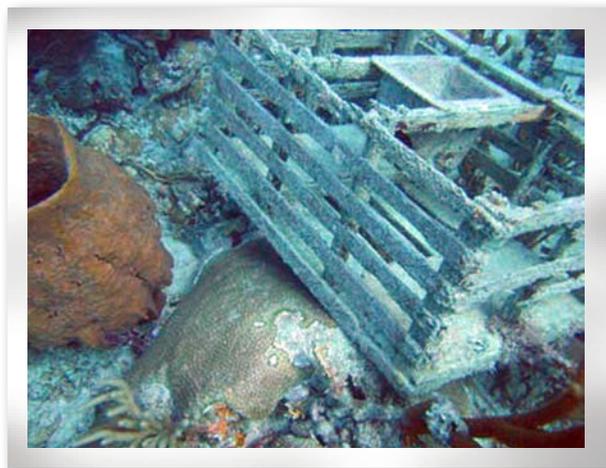
Team OCEAN volunteers use kayaks to collect marine debris.

<http://floridakeys.noaa.gov>

Lost lobster and crab trap fishing gear made up 42% of the total number of items found in the 2012 survey, making it the second most abundant type of debris. Trap gear consisted mostly of lost and broken lines, wooden slats, plastic trap throats and cement weights. This type of gear was found in all habitat types from inshore patch reefs to deeper fore reefs, but was substantially more prevalent on patch reefs, being found on 48% of inshore patch reefs and 46% of all offshore patch reefs.

Glass bottles, plastics, metals, as well as anchors and other trash made up the third and least common category of debris. Items in this “other” category were found at 17% of sites. The prevalence of glass bottles and “other” debris was greatest on patch reefs, but also great on popular shallow, high-relief spur and groove reefs. The large amount of debris found on patch reefs suggests that they are heavily used by people.

Over the past decade, mean densities of marine debris found inside and outside of sanctuary protected zones have tended to be similar. In 2012, though, mean densities of all debris types for all habitats were 1.7 times greater in study areas outside of zones compared to areas inside zones. Fishing and entry restrictions in protected zones may partially account for reduced debris inside zones. Occasionally, fresh (un-fouled) hook-and-line angling gear was found inside protected zones, suggesting illegal fishing had recently taken place there. Movement of debris by currents and people fishing along zone boundaries could also account for the presence of un-fouled gear inside zones.



Lobster traps can move during storms and damage corals.
Photo: Nova Southeastern University

Fishing Line and Trap Rope Cause Damage to Reef Corals

The 2012 data indicate that while lost angling gear was the most prevalent debris category, the impact of entangled trap debris on marine life, especially trap rope, was greater than for other types of debris. Trap debris was responsible for 63% of the impacts to marine life, while angling gear was responsible for 32%. The remaining injuries to benthic organisms came from marine debris other than fishing gear. Sea fans, sea whips and other soft corals sustained 48% of the injuries, followed by stony corals, then sponges.

While boating, fishing or diving, take a few simple steps to keep marine debris out of sanctuary waters and away from Keys' shorelines.

Boaters – Stow your trash in a designated container with a tight-fitting lid before getting underway. Use a boat hook to retrieve trash floating on the water's surface.

Divers and snorkelers – Collect bottles, cans and other trash for proper disposal. Be careful not to damage marine life when retrieving debris.

Anglers – Consider selecting fishing locations where you have less chance of entangling corals. Bring back all monofilament line, hooks and other gear. Recycle (or dispose of) fishing line at designated locations to keep it from entangling pelicans and other wildlife.

Everyone: Participate in Team OCEAN and other coastal and underwater clean-up events.

No-Trap Zones Protect Threatened Corals

In 2006, NOAA Fisheries Service listed elkhorn and staghorn corals as threatened species under the Endangered Species Act. Long-term declines in these corals are thought to be caused by a combination of factors. A Florida Fish and Wildlife Conservation Commission study documented that lobster traps moved several meters during storms and caused harm to corals and other marine life living attached to the seafloor. In 2012 NOAA Fisheries implemented 60 relatively small no-trap zones surrounding the known stands of elkhorn and staghorn coral in federal waters of the Keys. These zones are expected to help protect elkhorn and staghorn from trap damage, giving them a better chance for recovery.

People Can Help Reduce Marine Debris

Over the years, volunteers with the sanctuary's Team OCEAN program and other groups have organized many coastal and underwater clean-up events to collect marine debris from the waters and shorelines of the Keys. Between 2007 and 2012, Team OCEAN volunteers have recovered more than 36,000 pounds of marine debris from the waters of the sanctuary. While clean-ups have been successful in removing large volumes of trash, debris still accumulates where it can harm marine life. Discharging trash or other items into sanctuary waters is against regulations and can be avoided if people properly dispose of (and recycle) their trash.

