RETRIEVING LOST FISHING GEAR FROM DEEPWATER HABITAT

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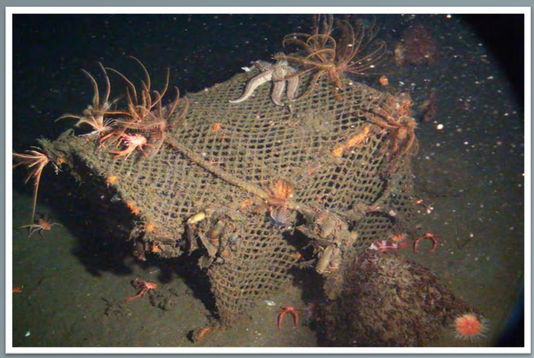
Monterey Bay National Marine Sanctuary



This spot prawn trap was found at Point Lobos SMCA and was retrieved with the ROV in 2010.

2009 and 2010 research platform, the F/V Donna Kathleen.

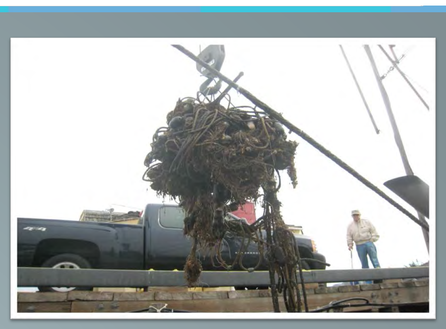
Introduction

The Monterey Bay National Marine Sanctuary (MBNMS) and partners are implementing a multi-year project to remove lost fishing gear from the deepwater habitats using a Remotely Operated Vehicle (ROV). The primary goals of the Lost Fishing Gear Removal project are to:

- Reduce benthic and pelagic hazards to marine organisms posed by lost fishing gear debris.
- Develop and test deepwater gear retrieval procedures.
- Reduce navigational hazards for fishermen and deepwater researchers.
- Conduct site surveys and deepwater characterizations.
- Provide outreach through HD images and video.
- Provide technical experience for staff and partners.

Background

Submersible and ROV surveys by the National Marine Fisheries Service and MBNMS have documented long lines, gill nets, crab and fish traps, and trawling gear on the seafloor and/or floating up into the water column. Trawl and gill nets are constructed to be strong and resilient, thus preventing escape of entangled wildlife and persisting in the deep-water environment for decades. Lost traps continue to catch prey as predators enter the traps to feed on dead and dying entrapped organisms. Both nets and traps can physically scrape organisms off of hard reef habitat or sweep immobile invertebrates from sandy areas. Lost fishing gear also causes hazards to fishermen by snagging newly set gear on top of previously lost gear.



Retrieved net is brought back to shore for proper disposal. (2009)

Retrieving the Phantom HD2 ROV (2009).

Methods

Study Sites

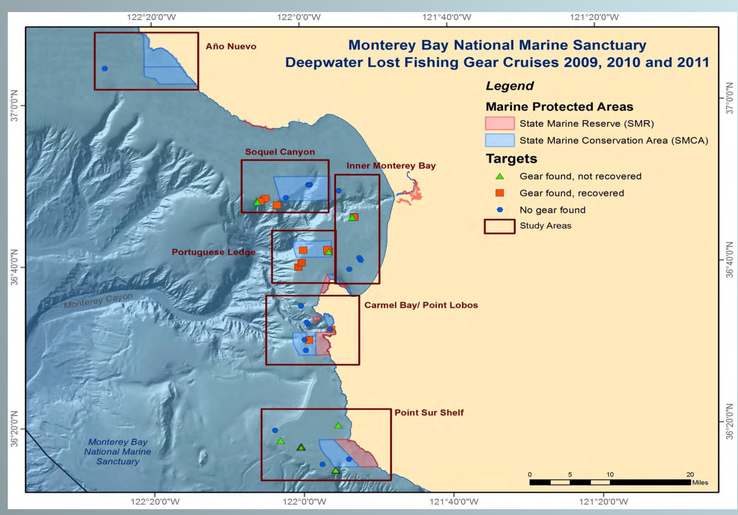
Selected dive locations were based on lost fishing gear positions documented by 2003, 2004, 2007, 2008 and 2009 submersible surveys, a 2006 camera sled survey and on information provided by local fishermen. Targeted gear included gill nets, traps (crab, lobster, *Pleurobrachaea californica*, and fish traps), a clump weight and trawling gear.

During the 2009 cruise aboard the F/V *Donna Kathleen*, efforts were focused within state marine protected areas (MPAs) to enhance the MPAs productivity by reducing the potential for entanglement of living marine resources. During the September 2010 cruise, the search for fishing gear centered on the edges of Monterey and Soquel Canyons, and within two MPAs, Portuguese Ledge and Point Lobos State Marine Conservation Areas (SMCAs), all located within the sanctuary. In 2011 we added the sites within the Point Sur Shelf study area (see map below) and worked aboard the R/V *Fulmar*. Operational depths ranged from 40 to 300 meters.

Gear Retrieval

The following criteria were considered during this operation: Impacts by gear to animals and habitat with a high priority given to endangered or protected species and sensitive habitats; threats to fishing operations or research operations; impacts to habitat as a result of removal; and feasibility of removal.

The Phantom HD2 ROV was retooled with additional thruster power lights, an HD video camera, a hooking and a cutting manipulator, and a spool with resilient Spectra line to enhance the ROV's fishing gear recovery capacity in diverse deepwater habitats. One of two retrieval methods was employed: 1) a snipping device attached to the ROV's manipulator arm cut the line and a grabbing device on another manipulator arm grasped the net fragment and pulled it up as the ROV was retrieved; and 2) a carabineer (metal hook) was clipped onto the net or trap with the grabbing arm, and as the ROV was retrieved, the spool line paid out to the surface. The spool line was then transferred to the boat's hydraulic winch and the gear was hauled up to the surface.

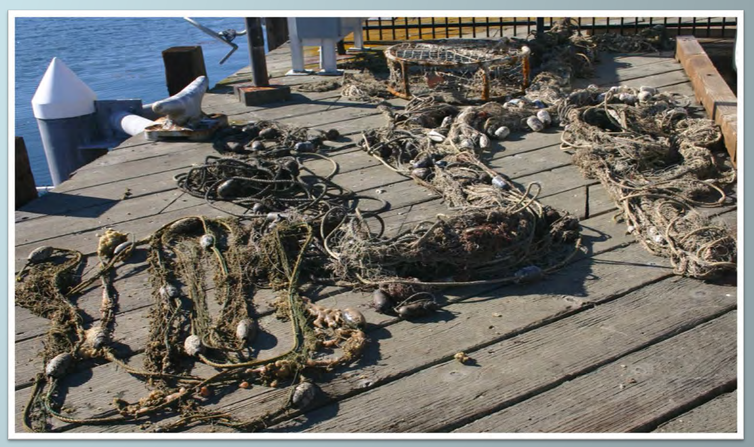


ROV dive sites where HD video and images were taken and where lost gear was recovered when possible (orange squares).

Results

More than 1,000 pounds of lost fishing gear has been removed from the deepwater environment as a result of this project. In 2009, the removed fishing gear weighed over 500 pounds, and included a crab pot, an anchor entangled with two 100-foot rockfish gill nets, and a 40-foot rockfish gill net fragment. Over 70 monofilament targets were marked during one ROV transect at Portuguese Ledge SMCA. In 2010, the team retrieved a total of 450 feet of rockfish gill net in 250-300 meters of water depth, two crab pots in 225 meters, a prawn trap in 275 meters and 600 pounds of lead weights in 100 meters. Thirty hours of HD video surveys in 2010 identified additional gear including a large trawl net complete with headline, steel cabled footline and both doors and a 50-foot sunken sailboat. In 2011, we collected HD video and images from 20 different sites and recovered three traps and one gillnet. Sixty-four total dives were completed during the three cruises.

Collected specimens were identified by the California Academy of Sciences. Documented species included brittle stars, urchins, tube worms, bristle worms, octopi, brachiopods, nudibranchs, glass sponges, nipple sponges, shrimp, squat lobsters, decorator crabs, cat shark egg cases, chitons, cup corals, cookie cutter stars, sun stars, metridium anemone sp, crinoids, flatfish, and rockfish.



Two rockfish gill nets and a crab trap retrieved from Portuguese Ledge SMCA in 2009 laid out to dry on the dock.

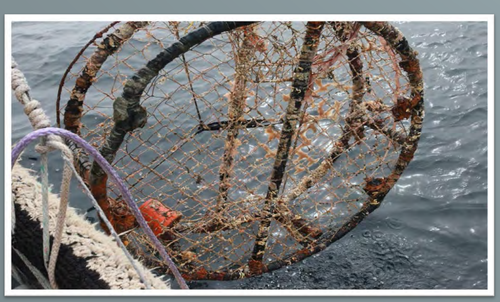
A wolf eel makes it home in a crevice surrounded by anemones and monofilament on a rocky ledge within Portuguese Ledge SMCA (78 meters). (2011)

Lophelia Pertusa, a species of deepwater coral found encrusting a net, is rarely seen in the Pacific Ocean (2009).

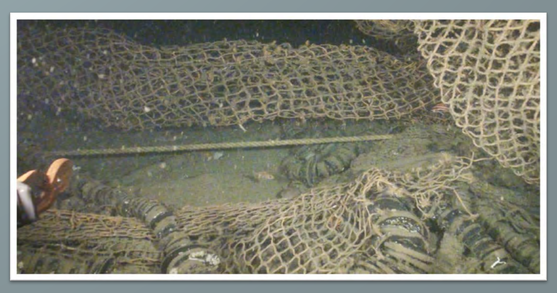
Conclusions

Retrieved gear did not appear to be actively fishing. However, it tended to be encrusted, providing a unique opportunity to characterize the associated biological communities. This project is a model of successful collaboration resulting in: HD outreach video and images; characterization of biological communities and descriptions of specimens not found before in Monterey Bay; a positive relationship between fishermen, scientists and marine managers; and a safer environment for fishermen, deepwater submersible researchers, and the organisms that inhabit those environments. **For more information please see:**

http://montereybay.noaa.gov/resourcepro/resmanissues/lostgear.html



Retrieved round crab trap brought on board F/V Donna Kathleen (2009).



Large trawl net found at Portuguese Ledge SMCA at 95 meters. Sections of the net are floating in the water column. (2011)

Acknowledgements

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