



ghostnets

Most people have heard about the huge island of plastic rubbish in the north Pacific. Most have seen the photos of the seals and dolphins strangled by plastic bags. Most, too, know that the vast majority of this rubbish comes from urban centers—where people like you and me discard single-use plastic bags, bottles, and packing materials—and that many people are working to change this throw-away paradigm. There is, however, another lesser acknowledged form of rubbish that plagues our seas today: ghost nets.

Ghost nets are lost or discarded fishing nets that travel the world's oceans on the currents, indiscriminately trapping sea turtles and other marine life in their wake. Reaching up to 15 meters (49 feet) in depth and 90 kilometers (56 miles) in length, those nets may continue to "ghost fish" for up to 600 years, according to some estimates, before disintegrating. Huge, heavy, and dangerous, ghost nets are difficult to contend with anywhere. Nonetheless, two groups from very different parts of the world are confronting the ghost net problem head-on, thereby demonstrating promising ways of accomplishing the job.

Partnering to Rescue Turtles from Ghost Nets on Shore

Sea turtles are culturally, economically, and ecologically important to the indigenous peoples of northern Australia, an area where six sea turtle species come to forage and breed. When indigenous sea rangers noted how many of those cherished animals were being trapped and killed by the ghost nets washing up on their remote shores, they decided to take action. In 2004, rangers from 18 different communities in the Torres Straits, Arnhem Land, and the Gulf of Carpentaria put aside local differences and came together to form the Carpentaria Ghost Nets Programme.

The Carpentaria Ghost Nets Programme takes a comprehensive, on-the-ground approach to solving the ghost net issue, following a methodology defined by "6Rs": Remove, Record, Rescue, Report,

"We believe our well-being and the turtles' well-being are inseparable.

To put it another way, we belong to turtles and turtles to us—we sustain them and they us. As custodians and managers of sea country, we have the responsibility to work with others to manage turtles."

—Kennett, Munungiritj, and Yunupingu

Reduce, and Research. Over the past three years, the group has walked and driven 1,500 kilometers (903 miles) of coastline while excavating, untangling, hauling, and cataloguing more than 4,700 ghost nets that originated from various places around the world. Apart from small crabs, sea turtles have accounted for 95 percent of marine life found in the nets, and more than half of the turtles encountered have been successfully rescued and returned to the wild.

In February and March 2008, monsoons brought a particularly high number of turtle strandings to Pennefather Beach—a 42-kilometer (26-mile) stretch of beach on Cape York. Amid extremely challenging weather conditions, Napranum Shire Council Rangers Peter Harper and Angela Christie organized volunteers to help patrol the beach for entangled marine life. A total of 62 turtles, mostly olive ridleys, were found over the course of a three-week period. Of those, 15 animals were found dead, 21 were released on site, and

26 were taken to a makeshift rehabilitation center where all but three were nursed back to health.

Three months later, the Sea Rangers were joined by a team from Conservation Volunteers Australia to begin the process of removing nets. During a period of nine days, the expanded group not only removed and processed 470 ghost nets and 40 bags of other marine debris, but also released the last remaining turtle from rehabilitation equipped with a satellite tag generously donated by Dhimurru Rangers from Nhulunbuy.

The success of the Carpentaria Ghost Net Programme is an example of what can happen when communities come together to find solutions.

Tackling Ghost Nets on the High Seas

Headquartered in Wasilla, Alaska, the High Seas GhostNet Project has taken a different approach to solving the problems posed by ghost nets. Rather than collecting nets that have already drifted ashore, this group of scientists, academics, and businesspeople aim to remove the nets from the open seas.

The project was born in May 2001 at an Alaska Regional Workshop in which U.S. Senator Ted Stevens, the keynote speaker, challenged workshop participants to find ways of using technology in ghost net mitigation. The team that responded proposed using ocean modeling, together with satellite and airborne remote sensing, to identify convergence zones in the north Pacific where lost or abandoned





fishing nets would be expected to accumulate. Initially funded by a grant from the National Aeronautics and Space Administration, the project is now supported by the National Oceanic and Atmospheric Administration (NOAA), and it currently consists of team members from Airborne Technologies, Inc. (ATI), NOAA's NESDIS/STAR (National Environmental Satellite, Data, and Information Service/Center for Satellite Applications and Research), and the Joint Institute for Marine and Atmospheric Research.

The team's first field program was conducted during summer 2003 in the Gulf of Alaska, where, using satellite imagery, the High Seas GhostNet team identified and tracked four long-term eddies likely to draw debris. With near-real-time tracking capabilities provided by satellite, an aircraft with remote sensing equipment was directed to fly over the eddies. The aircraft confirmed the satellite data, identifying concentrations of debris retained within the eddies.

A drifter buoy program has also been initiated to help track ghost nets until their safe removal from the water is possible. Small drifter buoys developed and built by ATI are distributed to select ships traveling in these general areas of convergence. When ships come across debris, they tag it with a buoy that communicates its position by satellite, not only revealing the position of the nets, but also confirming the movement of debris in ocean circulation patterns.

Building toward more focused ghost-net removal efforts, ATI is currently developing a small Unmanned Aircraft System (UAS). The UAS will be capable of being deployed from ships directed into areas

of convergence by satellite data and will help those ships to locate individual nets for immediate retrieval. Successful test flights were performed aboard a NOAA ship this past spring.

Our oceans are highly complex and are deeply affected by what we put in and take out of them. Cleanup programs aimed at removing ghost nets, such as those just described, are vital to overall ocean health and to the prevention of the loss of sea turtles and other marine life caught in their grips. Moreover, programs such as these provide a wonderful opportunity to create awareness about ocean conservation and to involve local people and scientists alike in hands-on problem solving. Long-term solutions for reducing this dangerous form of manmade waste will require an integrated program of action locally, nationally, and internationally and a concerted effort to broaden our understanding of marine pollution.

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THIS PAGE: A prototype for an Unmanned Aircraft System, meant to aid in the detection of marine debris in the open ocean, is tested aboard a National Oceanic and Atmospheric Administration vessel. © NOAA AT LEFT: Of the nearly 5,000 nets identified by sea rangers in the Gulf of Carpentaria, less than 10 percent are of Australian origin. © ALISTAIR DERMER / CARPENTARIA GHOST NETS PROGRAMME PREVIOUS PAGE: A green turtle is found entangled in a ghost fishing net in the Cayman Islands. © DOUG PERRINE / SEAPICS.COM