Directions
Read this article. Then answer question 48.

Monster Debris

by Loree Griffin Burns

In 1991, scientists in Hawaii found a four-thousand-pound monster in the sea.

"Driving up to it in a small boat, it looked very much like a barely emergent sand islet or reef," remembers Dr. Mary Donohue, one of the team of scientists who eventually captured the beast. "It was so buoyant that we could easily stand on it in the water."

The monster was actually a giant mass of discarded fishing nets that had become hopelessly tangled together at sea. The huge ball of plastic was longer than a school bus and half as heavy.

Unfortunately, abandoned nets like this are fairly common. The nets are lost, ripped, or thrown from fishing vessels, and these days they can be found drifting almost anywhere in the world ocean. Scientists call them "ghost nets" because of their eerie ability to continue the work they were designed for—that is, to catch fish—even when they are no longer attached to a fishing boat. As they drift with the currents, ghost nets silently devour everything in their path: fish, turtles, sharks, whales, seals, sea birds, and even trash.

"When an animal gets tangled," explains Mary, "it attracts other predators who feed on the remains and end up entangled themselves."

As if drowning animals weren't bad enough, drifting ghost nets also crush and scrape coral reefs, ruining hundreds of years' worth of coral growth in the crash of a single wave. Mary has seen some of this damage firsthand.

"In some places it looks as if a bulldozer has been driven over the coral reef," she says. "These ghost nets are really destructive."

With the help of dozens of divers, a Coast Guard cutter, and a crane, scientists were eventually able to pull the monstrous ghost net out of the ocean. But surveys conducted by Mary and others found tons—more than fourteen tons, to be exact—of other ghost nets and net pieces littering the Hawaiian Islands environment. To protect the environment as well as the marine animals that live in it, Mary and her colleagues began a program to find, count, and remove ghost nets. Between 1999 and 2005, this group of dedicated scientists, divers, and ecologists removed five hundred tons of net debris from the area,

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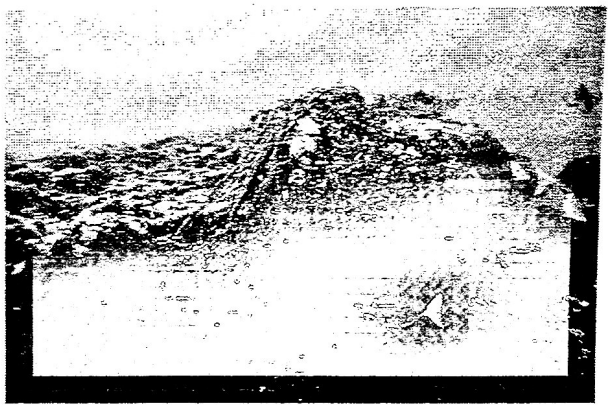
mostly by hand. Even with this success, however, Mary is realistic about humankind's status in the battle against ghost nets.

"The bottom line," she says, "is that we're making a difference ... but right now we're barely holding steady."

Three thousand miles away, Colorado researcher Jim Churnside is working to tip the scales in favor of net removal. Like Mary, Jim is studying the ghost net problem, but from an entirely different angle. With the help of Alaskan pilot Tim Veenstra, he is studying ghost nets from the sky. Tim and Jim believe that one way to protect Hawaii's delicate habitat is to remove ghost nets from the Pacific Ocean long before they drift near the islands. But how do you find ghost nets the size of a school bus (and most are much smaller than this) in an ocean that is larger than all seven continents combined? The job would be like trying to find a needle in a haystack ... unless you know something about Pacific Ocean currents and how floating objects drift in them.

"Our first step was to talk to Jim Ingraham about where in the North Pacific Ocean we should look for the ghost nets," says Jim Churnside. "Then we followed his directions to more specific locations using satellites and aircraft."

In 2003, Churnside and Veenstra launched the GhostNet Project. In collaboration with scientists across the country, the two flew over the Garbage Patch[1] using satellite information, radar, and other technologies to spot ghost nets. In three days' time they saw more than one hundred drifting ghost nets ... and thousands of other types of floating debris.



"There is a lot more trash out there than I expected," said Jim Churnside.

The GhostNet Project continues to monitor the Garbage Patch. The hope is that scientists will eventually be able to use information from satellite pictures of the ocean to determine exactly where ghost nets are. Remember that the exact locations of surface currents can change from year to year. As a result, the exact location of the Garbage Patch changes, too. Combining information from satellites with information from computer models like OSCURS will help scientists to locate the Garbage Patch, and therefore ghost nets, more accurately.

[1]**Garbage Patch:** large area of ocean trash formed by a spiral of currents in the Eastern Pacific Ocean. The Garbage Patch contains approximately 3.5 million tons of trash, mostly plastic debris.

Directions

Read this article. Then answer questions 49 through 51.

Too Many Fishermen

by Carole Garbury Vogel

The shimmering blue waters of the ocean cover nearly 71 percent of the Earth's surface. However, if you look at a world map you will most likely see the continents drawn in great detail, while the ocean is depicted as a monotonous blue expanse with no hint of the majestic landscape beneath the waves. If you could explore the vistas[1] on the ocean floor, you would find deeper valleys, wider plains, and mountain ranges longer and more massive than anywhere on land.

You would also discover that the majority of ocean life lives within oyster bays, coral reefs, and other habitats in the shallow water rimming the continents. Impressive as this watery world appears today, it pales in comparison to what it once was. Just three hundred years ago you would have found colossal underwater "cities" packed with sea life along every coast. Overfishing turned many of these lush marine havens into biological deserts.

Overfishing depletes fish stocks by taking fish at a rate faster than they can replace themselves. Many fish are harvested before they are even mature enough to reproduce. As a result, marine species are disappearing at an alarming rate. Some kinds of whales and other sea creatures have already been hunted to extinction. More are on the verge. And development along coasts that drains swamps and fills in wetlands has eliminated precious nurseries for new generations of fish and shellfish.

The same map that gives little information about the ocean realm provides clues about the sea life that previously flourished near shore. Place-names like Cape Cod (Massachusetts), Oyster Bay (New York), Seal Harbor (Maine), and Herring Bay (Maryland) are ghostly reminders of animals once plentiful in these locations.

Historical records provide insight, too. Can you imagine New York's harbor crowded with seals, whales, and porpoises, and its shores teeming with lobsters 6-feet (108-meters) long? The Dutch found such bounty when they settled the region in the early 1600s.

Most people know more about the dinosaurs, which became extinct 65 million years ago, than about the massive sea animals that died out within the last three centuries along their own nation's coasts. However, unlike dinosaurs which will never come back, many sea creatures have a chance of recovery. They are considered to be "ecologically extinct." This means that there are still some left but not enough to make an impact on an ecosystem. Their numbers may increase if they are protected from fishing—commercial as well as sport—and if their habitats are shielded from development and pollution.

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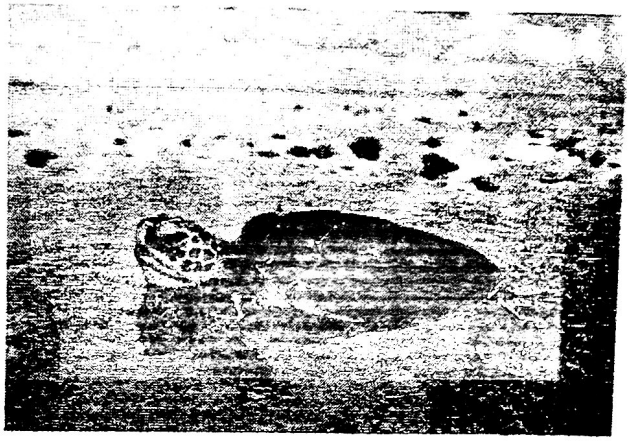
[1]**vistas:** views

Overfishing began in the Stone Age. For example, tens of millions of green turtles once lived in the Caribbean Sea. Now so few remain that the survival of the species is threatened. The turtle decline started three thousand years ago when humans settled the region. The turtles were agile in the water but they made easy prey for hunters when they lumbered up sandy beaches to lay eggs. The people came to rely on turtle meat and eggs as a major part of their diet. On some islands, the turtles disappeared by 800 A.D. From the 1500s on, European settlers hastened the demise of the remaining turtle populations by harvesting them not only for food, but also for their skin to make leather, and their shells for use in jewelry and other ornaments.



51

"Monster Debris" and "Too Many Fishermen" both indicate that human beings are having a negative impact on ocean life. How does each author support this claim? Describe the evidence each author uses and evaluate the relevance and strength of the evidence. Use details from **both** articles to support your response.

In your response, be sure to

- identify the support given in each article that shows the negative impact human beings have had on the ocean environment
- evaluate the effectiveness, strength, and relevance of the support
- use details from **both** articles to support your response

GO ON

STOP