

2006

STATE OF THE WILD

A Global Portrait of Wildlife, Wildlands, and Oceans

Hunting and the Wildlife Trade

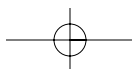
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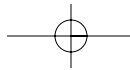
Sharon Guynup

Wildlife Conservation Society



WASHINGTON • COVELO • LONDON





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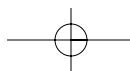
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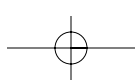
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Twine and the Ancient Mariners

Albatrosses, Sea Turtles, and Fishing Gear Encounters

CARL SAFINA, ERIC GILMAN,
AND WALLACE J. NICHOLS

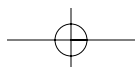
Albatrosses and sea turtles are linked by the grace of their epic “flights” above and below the mirroring sea surface. During their wanderings in search of sustenance, albatrosses and sea turtles spend years at sea, traveling thousands of miles, crossing oceans and eventually returning to land only to breed. Along these difficult journeys, many drown.

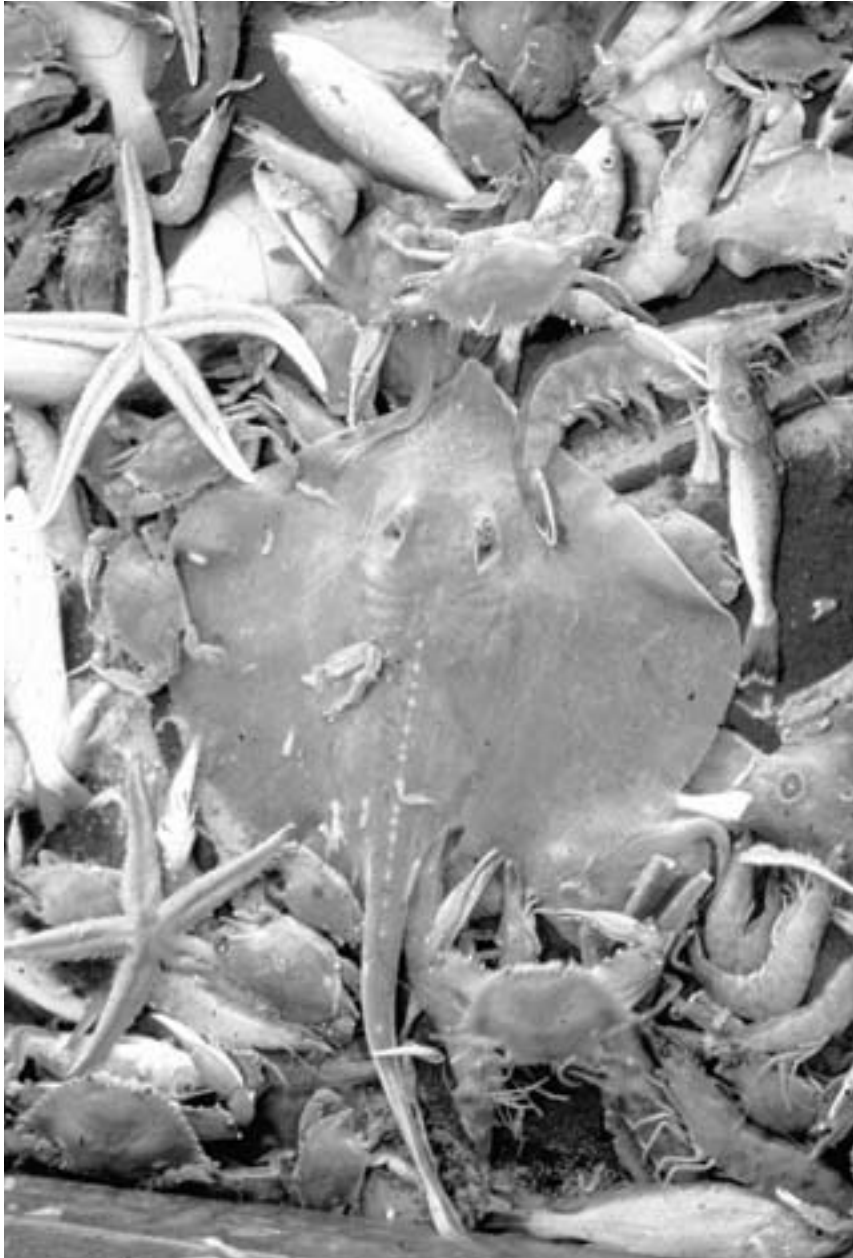
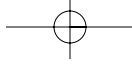
Serious declines of these wondrous creatures indicate unseen, deeper problems in our oceans caused by modern fishing practices. Every type of fishing gear—with the possible exception of the spear—inadvertently hooks, nets, or entangles nontarget sea animals. This unintended catch, known as incidental catch, bycatch, or bykill, is a global problem along coastlines in developed and developing countries and on the high seas. It is caused by large-scale industrial fishing fleets in combination with smaller vessels and local, coastal fisheries.

The discarded animals may not be saleable species or may be too small—or there simply may not be enough room for them onboard. Roughly one in four animals caught in fishing gear around the world is thrown overboard, dead or dying. Shrimp trawlers are much deadlier: for every pound (0.45 kg) of shrimp caught, between 4 and 8 pounds (2–3.6 kg) of other marine life is discarded.

According to a United Nations report, global commercial fisheries discard 60 billion pounds (27 billion kg) of bycatch each year.¹ Among the unintended: dolphins, seabirds, sharks, seals, turtles, fish, and other marine species, many of which are caught in sufficient numbers to drive declines of some populations and threaten the recovery of others. Three major commercial fishing methods are responsible for most bycatch deaths: longlines, gillnets, and trawls. Without prompt action, many species could be fished to extinction.

But it makes little difference to sea animals whether they are targeted or caught incidentally. Fishing is the main threat to commercial species as well: catches of targeted species have declined by about 90 percent since the 1950s due to overfishing in many fisheries with high bycatch rates.²

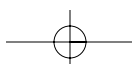


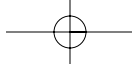


An estimated 30 million tons of bycatch are netted or hooked each year by fishing fleets around the world; these animals are often discarded, dead or injured.

(Credit: OCEANA)

Bycatch was not always a problem of this magnitude. Over the last decades, the fishing industry has grown tremendously, with larger fleets and bigger, faster vessels capable of covering huge distances. The issue first captured public attention during the 1960s when thousands of dolphins were dying in tuna nets. After the 1972 passage of the Marine Mammal Protection Act in the United States and a public outcry for “dolphin-safe” tuna, deaths declined dramatically. More recently, bycatch has been recognized as one of the most serious threats to many ocean species.





More than 100,000 albatrosses are killed every year by longline fishing boats, causing severe declines in all 21 albatross species.
 (Credit: Fabio Olmos)

BY THE NUMBERS

In the United States, percentage of red drum caught in the South Atlantic, bocaccio caught in the Pacific, and red snapper caught in the US Gulf of Mexico by recreational fishermen: 93, 87, and 59 percent, respectively

Longlines

One of the most venerated of seabirds is the large, graceful albatross, the bird that inspired Samuel Taylor Coleridge’s classic poem “The Rime of the Ancient Mariner.” For much of their lives, albatrosses soar on their wide wings thousands of miles over the open sea, searching for food. But at least 200,000 albatrosses and other seabirds are killed each year by longline fishing fleets that crisscross the oceans. Death tolls do not include orphaned chicks that starve after their parents are killed. Accurate bykill estimates are impossible; because much fishing is illegal or undocumented, bycatch is frequently under- or unreported and numbers are based on just a few well-studied fisheries (see color plate 7).

Longline fishing probably originated during the 1500s in the Mediterranean Sea. But it was not until the end of the 19th century, when factory-made metal hooks became both widely available and affordable, that longlining began to proliferate. Foreign fishermen used longlines in Norwegian cod fisheries during the 18th century—and were condemned by locals for being too effective.³

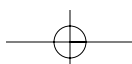
Today, longlining is one of the most common fishing methods. Boats set out lines up to 60 miles (100 km) long, bearing hundreds or thousands of baited hooks to catch swordfish, tuna, cod, and other fish. Fleets from 40 countries set about 1.4 billion hooks in 2000—equivalent to about 3.8 million hooks each day.⁴ Longline fishing is concentrated near the edges of continental shelves, sea-mounts, and other places where marine life is abundant—including both commercial species and those of conservation concern.

Longlines are particularly deadly to seabirds. As lines are set or retrieved off the rear of fishing boats, the birds dive after the free buffet of squid or fish used as bait. They swallow baited hooks or are impaled, then are dragged underwater and drown as the gear sinks.

Twenty-six of the 61 seabird species affected by longline fisheries are threatened with extinction. These include the wandering (*Diomedea exulans*) and royal albatrosses (*D. epomophora*) and other albatrosses from the family Diomedidae, the southern and northern giant petrels (*Macronectes giganteus* and *M. halli*), the white-chinned petrel (*Procellaria aequinoctialis*), and gray petrel (*P. cinerea*), to name a few.⁵

Each year in the North Pacific alone, 3,000-plus fishing vessels kill tens of thousands of seabirds on Alaskan longlines—while landing at least \$300 million worth of swordfish, sablefish, halibut, and other fish. The dead include nearly 1,000 albatrosses and about 15,000 seabirds, mostly fulmars. The United States operates less than 5 percent of top-floating pelagic longlines and 15 percent of seabed-anchored “demersal” longlines in the North Pacific; the main Pacific pelagic fleets hail from Japan, China, Republic of Korea, and Taiwan, while the Canadians, Japanese, and Russians operate about 17,000 demersal vessels.⁶

Two threatened albatross species in the North Pacific are in decline: the black-



footed (*Phoebastria nigripes*) and Laysan (*D. immutabilis*). Population models predict further black-footed albatross declines if losses exceed 10,000 flying-age birds per year;⁷ deaths in pelagic longline fisheries alone may exceed this threshold.⁸ Albatrosses produce few offspring and have low natural annual mortality, long lifespans, and late sexual maturity—traits that make populations extremely vulnerable (see color plate 9).

Farther south, Hawaii's tuna- and swordfish-targeting longliners kill approximately 3,000 albatrosses annually. Seabird numbers killed by fleets from Taiwan, Japan, Russia, China, Korea, and others may total 30,000.

At the worst end of the scale are illegal fishing operations. "Pirate fishing," rampant in the Southern Ocean, lacks standards or constraints—short of gunboats. Illegal fishing for Patagonian toothfishes (*Disostichus* spp., marketed as "Chilean seabass") kills an estimated 145,000 seabirds per year.⁹

Sea turtles suffer the same fate. For endangered Pacific loggerhead (*Caretta caretta gigas*) and leatherback turtles (*Dermochelys coriacea*), modern fishing methods pose the greatest threat to their continued existence. Like albatrosses and humans, turtles' natural lives span many decades and can approach the century mark. Often more than 20 years pass between the time they leave their natal beach as hatchlings and when they first breed. Their developmental and reproductive migrations take them across thousands of miles and through diverse habitats, from deep ocean basins to shallow lagoons and reefs. They spend much of their lives feeding, growing, and migrating in heavily fished temperate and tropical coastal waters. Everywhere, they are vulnerable to fishing gear (see color plate 8).

Turtles find and eat baited longline hooks and are entangled in other fishing gear—and drown. The combination takes a significant toll on sea turtle populations. In 2000, longliners worldwide were believed to have caught at least 200,000 loggerheads and 50,000 leatherback turtles.⁴ Not all of these died, but the survival rates of turtles that have swallowed hooks are unknown. Swordfish longlines snare turtles at 10 times the rate of those targeting tuna, as the latter are set deeper than depths turtles frequent (see color plate 10).

All seven sea turtle species have some measure of protection under the Convention on International Trade in Endangered Species (CITES). But marine biologists at Duke University estimate that if longlining continues unabated, there is a 50 percent chance of turtle extinctions in the next 10 to 30 years, notably the leatherback turtle—and their decline is strongly linked with longline fisheries.



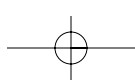
In Mexico and other countries where turtle meat is a regional delicacy, sea turtle by-catch is often sold in regional markets.

(Credit: Jeffrey Brown/jeffreymbrown.com)

More than 250,000 loggerhead and leatherback sea turtles are caught each year by commercial longline fishing boats.

(Credit: Fabio Olmos)





Eastern Pacific leatherbacks, which nest on beaches in Costa Rica, Nicaragua, Panama, and Mexico, plummeted from an estimated 91,000 adult females in 1980 to only 1,690 within two decades largely because of longlines.¹⁰

Pelagic longlining kills many other nontarget species as well, especially sharks. The World Wildlife Fund estimated in December 2002 that 12 million sharks die each year as bycatch.

Gillnets

Gillnets also catch large quantities of unwanted marine life. These nets fish passively: they hang vertically in the sea like invisible tennis nets, set either to float or drift, or are anchored to the bottom. They are the preferred method of small-scale fishing and are used throughout the world's coastal waters.

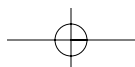
Drift gillnets target billfishes, tunas, sharks, mackerels, dolphinfish (*Coryphaena hippurus*), and other species, while anchored gillnets are used to catch coastal fishes such as halibut and rays. Huge driftnets have been used extensively across the high seas Pacific and parts of the Atlantic since the early 1980s. In 1993, the United Nations banned gillnets over 1.6 miles (2.6 km) in length, due in part to their nonselectivity.

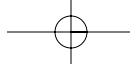
Seabird bycatch in coastal gillnets is a greatly underreported conservation threat to murrelets and other coastal diving seabirds. The death toll can be huge: in Witless Bay, Newfoundland, fixed gillnets drowned between 20,000 and 30,000 common murrelets (*Uria aalge*) each year during the early 1970s—13 to 20 percent of the local breeding population.

Case studies suggest that coastal gillnet fisheries cumulatively pose a pressing threat to some sea turtle populations as well. For example, a gauntlet of drift-gillnets off the coasts of Chile and Peru have been implicated in the recent collapse of the Central American nesting population of leatherback sea turtles¹¹; 80 percent of those entangled in Chilean gillnets perish.¹² In Mexico, the Magdalena Bay gillnet fishery is a major threat to the North Pacific green turtle (*Chelonia mydas*) population.¹³

One Mexican study quantified impacts. Young loggerheads congregate off the southern Baja Peninsula, where they spend two decades maturing and feeding on swarms of pelagic red crabs before crossing the Pacific to breed on their natal Japanese beaches. But many never make the trip. Near Playa San Lazaro, 394 loggerhead turtle carcasses were found washed up along a 28-mile (45 km) stretch of beach in 2003—representing just a fraction of the total killed.

Halibut fishers here reported capturing about four loggerheads each week per boat during the halibut season, which lasts four and one-half months. The local fleet numbers 50 to 70 small boats. Eighty percent perish; about 1,800 loggerhead turtles are killed each year by the Puerto López Mateos fishing fleet alone—just one of many local fishing communities. Just 20 percent of nesting





females remain as compared to two decades ago, now numbering under 1,000.¹⁴ The halibut fishery is the main reason for the precipitous decline.¹⁵

Trawls

Trawl nets—huge, bag-shaped nets pulled by boats directly over the seafloor or in midwater—also pick up large quantities of by-catch. Trawls target many different fishes, including cod, flounder, squid, and scallops; most shrimp vessels use trawls. The nets catch and drown many sea turtles, as they are towed for hours before being hauled to the surface.¹⁶ Shrimp trawls are believed to kill more turtles than other gear—an estimated 150,000 each year worldwide.¹⁷ In 1990, the US National Science Foundation's National Research Council called shrimp trawling the most lethal human activity for juvenile, subadult, and breeding sea turtles in US coastal waters.

These nets also catch many nontargeted fish species. Studies have shown that midwater trawls pose a threat to dolphins, sea lions, long-fin pilot whales (*Globicephala melaena*), and other marine mammals.

Gear Modifications

But there is hope, and the situation is not uniformly bleak. Modifications in commercial fishing gear can protect threatened species. Recent increases in Kemp's ridley (*Lepidochelys kempii*), green, and juvenile loggerhead turtles off the southeastern United States reflect the success of conservation actions there, including the widespread use of turtle excluder devices (TEDs).

In the late 1980s, the National Marine Fisheries Service (NMFS) began requiring use of these relatively inexpensive devices by shrimp trawlers in the United States. The TED is essentially a trap door fitted into a shrimp net that permits turtles to escape but traps shrimp. NMFS has shown that TEDs release up to 97 percent of sea turtles from nets with a minimal loss of shrimp.

But to be effective, TEDs must be large enough to allow adults to escape, their use must be legally mandated, compliance must be widespread, and enforcement must be effective. In many parts of the world, TED use is spotty or nonexistent. One example is Orissa, India, which hosts a critical olive ridley (*Lepidochelys olivacea*) rookery. The Wildlife Institute of India tallied turtle carcasses that washed up on beaches there from late 1993 to 1999. They found more than 30,000, with 13,575 in the 1997–1998 season alone.¹⁸ In 1999, none of the roughly 3,000 trawlers operating off the coast used TEDs.

In 1989, the United States passed legislation banning shrimp imports

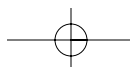


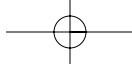
Turtle excluder devices (TEDs) have been shown to reduce bycatch of some sea turtle species by 97 percent, but their use by shrimp trawlers and others remains low.

(Credit: Carl Safina)

The turtle excluder device, or TED, provides an escape hatch for captured turtles from shrimp trawl nets.

(Credit: Mary Beath)





Serious declines of these wondrous creatures indicate unseen, deeper problems in our oceans caused by modern fishing practices.

from countries that did not employ TEDs; in 1998 the World Trade Organization voted that the law violated WTO rules—and that only individual boats could be embargoed.

The United States has implemented both temporary and permanent fishery closures to protect areas where turtles congregate in response to lawsuits by environmental groups. In March 2004, California’s longline swordfish fleet was banned from operating in a large swath of the Pacific. Swordfish longliners were banned from the Hawaiian Islands from 2001 to 2004, but the fishery was

reopened when new turtle-friendly, G-shaped “circle” hooks were designed that cut the risk of snagging turtles. Likewise, the Grand Banks of Newfoundland were reopened to the American deepwater longline fleet last summer, also requiring use of circle hooks; the old J-shaped hooks are now banned from all Atlantic longline fisheries, including the Gulf of Mexico and the US Caribbean.

Turtles caught on circle hooks are usually hooked in the mouth, versus J hooks, which are easily swallowed, causing internal damage. However, this is beneficial only in shallow waters, as most turtles hooked in deep-sea fisheries drown regardless of how they are hooked. For deep longlines, setting gear below 328 feet (100 m) and using fish instead of squid for bait may protect turtles (see color plate 11).¹⁹

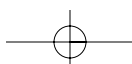
Over the past 15 years, national governments, regional organizations, and longline operators have developed and tested several fishing methods that nearly eliminate bird captures in longlines—and fishermen have begun using some effective low-tech, low-cost measures. Since most birds are hooked as longline gear is deployed, some fishermen are now setting longlines at night when seabirds are less active, using thawed bait that doesn’t float, adding weights to lines, or dyeing bait so that birds don’t recognize it as food. Birds can also be kept away from hooks by flying bright, shiny “scare lines” on fishing gear, by deploying lines through tubes that extend deeper than the birds can dive, or by setting lines off the side of the boat rather than the rear to limit birds’ access to the bait.²⁰

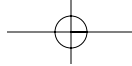
Mitigation methods must be determined according to the type of fishery, vessel design, type of fishing gear, and seabird diving abilities. Methods that increase profits by reducing bait loss and increasing efficiency—and therefore profits—have the best chance of being accepted by the fishing industry.

Bird bycatch avoidance measures are required for fleets in Alaska, British Columbia, and Hawaii as well as Australia and New Zealand, which were among the first to recognize the albatross bycatch problem and to pioneer solutions. Japan and Canada also require longliners to use bird-avoidance techniques.²¹ But China, Korea, Mexico, Russia, and Taiwan lack regulations,²² as do most of the world’s longline fleets. There are many reasons for this, from inadequate management and enforcement and low industry awareness to insufficient economic incentives and habit.

BY THE NUMBERS

Number of seahorses caught yearly for traditional Asian medicine: 18 to 21.6 million





Fishing and protecting marine life do not have to be mutually exclusive activities. For example, off the Pacific coast of Washington, fishermen found that putting 20 rows of visible mesh along the top of gillnets reduced common murre drownings by nearly half, yet did not significantly reduce their salmon catch. If fishing is restricted to only peak sockeye season versus fishing year-round—and is restricted to the middle of the day instead of the usual dawn to dusk hours—bird catch can be reduced by 75 percent.²³

The authors are involved in experimental gear modifications with Baja fishermen in an attempt to reduce their gillnet bycatch by using more tautly stretched nets. Another innovative but simple solution implemented off the northeastern US coast grew from a partnership between government and the fishing industry: changing hook and bait styles reduced encounters with leatherbacks and loggerheads by roughly 65 and 90 percent, respectively.

Toward Solutions

Minimizing capture in only a few longline fleets will not sufficiently protect wide-roaming seabirds. International treaties and agreements are needed, and several have been completed.²⁴ But what counts is what actually happens on fishing boats.

However, agreements could mandate fishing gear design. For example, manufacturers could easily produce weighted lines made to international specifications that quickly sink hooks. Such international standards would be an important step forward, especially for fleets that currently use no mitigation methods, including illegal outfits.

The knowledge exists to reduce bird deaths from longline fisheries to insignificant levels. This reduction, however, will require raising industry awareness, widely implementing existing multilateral accords, and establishing and enforcing effective conservation measures. Motivating fishing boat captains will be crucial.

In order for other depleted species to recover, protected areas are needed, particularly in crucial spawning or nursery grounds, and will require adequate enforcement and monitoring programs to ensure compliance on behalf of fishers.

Conventions like the Inter-American Convention for the Protection and Conservation of Sea Turtles also hold promise for improved international cooperation. Enacted in May 2001, this remains the only international treaty dedicated exclusively to sea turtles, setting standards for the conservation of these endangered animals and their habitats. And last year, over 400 leading scientists and 100 organizations from around the globe petitioned the United Nations for a

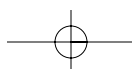
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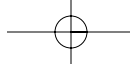
Number of turtles confiscated in December 2001 by Hong Kong customs officials from a single trade ship arriving from Macau: about 10,000

Of the 11 turtle species on-board, percent protected under the Convention on International Trade in Endangered Species: 90

Estimated value this turtle shipment would have fetched in live Chinese animal markets: \$3.2 million

To rescue marine life, we need a new sense of community that encompasses the ocean and its creatures. . . . We need a “sea ethic.”



**BY THE NUMBERS**

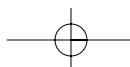
Percentage of all turtle species traded in southern China that are listed as threatened by the IUCN: 79

moratorium on pelagic longline and gillnet fishing in the Pacific Ocean to protect endangered sea turtles and other marine life.

There is obviously a need for a more comprehensive world strategy to reduce bycatch. Government agencies, research institutes, and nongovernmental organizations (NGOs) have begun to recognize the enormity and urgency of the problem—and the need to work collaboratively. Current initiatives include experimenting with additional fishing gear changes and working directly with fishing captains, supplying them with less deadly circle hooks, giving talks, holding workshops, and providing educational materials. Other measures include teaching fishermen turtle resuscitation and educating seafood consumers about problems with shrimp trawling to enlist them in the fight for cleaner fishing practices (see color plate 12).

Current fishing methods threaten extinction to species that have crossed oceans for millions of years. But recent innovations, which are already showing results, provide hope and impetus for sea turtle and seabird recovery, and reduction of needless slaughter of all by-caught marine species. Adoption of new policies and fishing practices can significantly lower bycatch—if we can succeed in getting their widespread use aboard fishing boats.

This will require greater effort and more funding. Haste is appropriate. The crisis is worldwide and ubiquitous throughout the seas. It goes deeper than just the gear we use. It involves the attitude of fishers and the disinterest of consumers. To rescue marine life, we need a new sense of community that encompasses the ocean and its creatures. In short, we need a “sea ethic.”²⁵





Color plate 7: (left) A drowned wandering albatross hooked off eastern Australia on a longline set by a Japanese tuna fishing vessel.

(Credit: Graham Robertson)

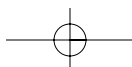
Color plate 8: (below) Researchers are tagging and tracking sea turtles to measure the impact of longline and gill net fishing off the Pacific coast of Costa Rica.

(Credit: Steve Winter/National Geographic Image Collection)



Color plate 9: As a result of bycatch mortality, breeding populations of Laysan albatross declined by one-third on Midway and Laysan islands, where over 90 percent of the world's population nests.

(Credit: James Orr)





Color plate 10: Changing from traditional J-shaped to circle-hooks on longlines could reduce unintentional hooking or snagging of sea turtles by 90 percent, although turtles can still swallow these hooks.

(Credit: OCEANA)



Color plate 11: Longline fishing boats kill more than 300,000 seabirds unintentionally every year. Birds gather to feed on bait, like these following a longline fishing boat off the coast of Brazil.

(Credit: Fabio Olmos)



Color plate 12: According to the United Nations, fisheries around the world discard some 30 million tons of bycatch each year—dead or dying animals that were caught accidentally and are often dumped into the sea.

(Credit: NOAA)

