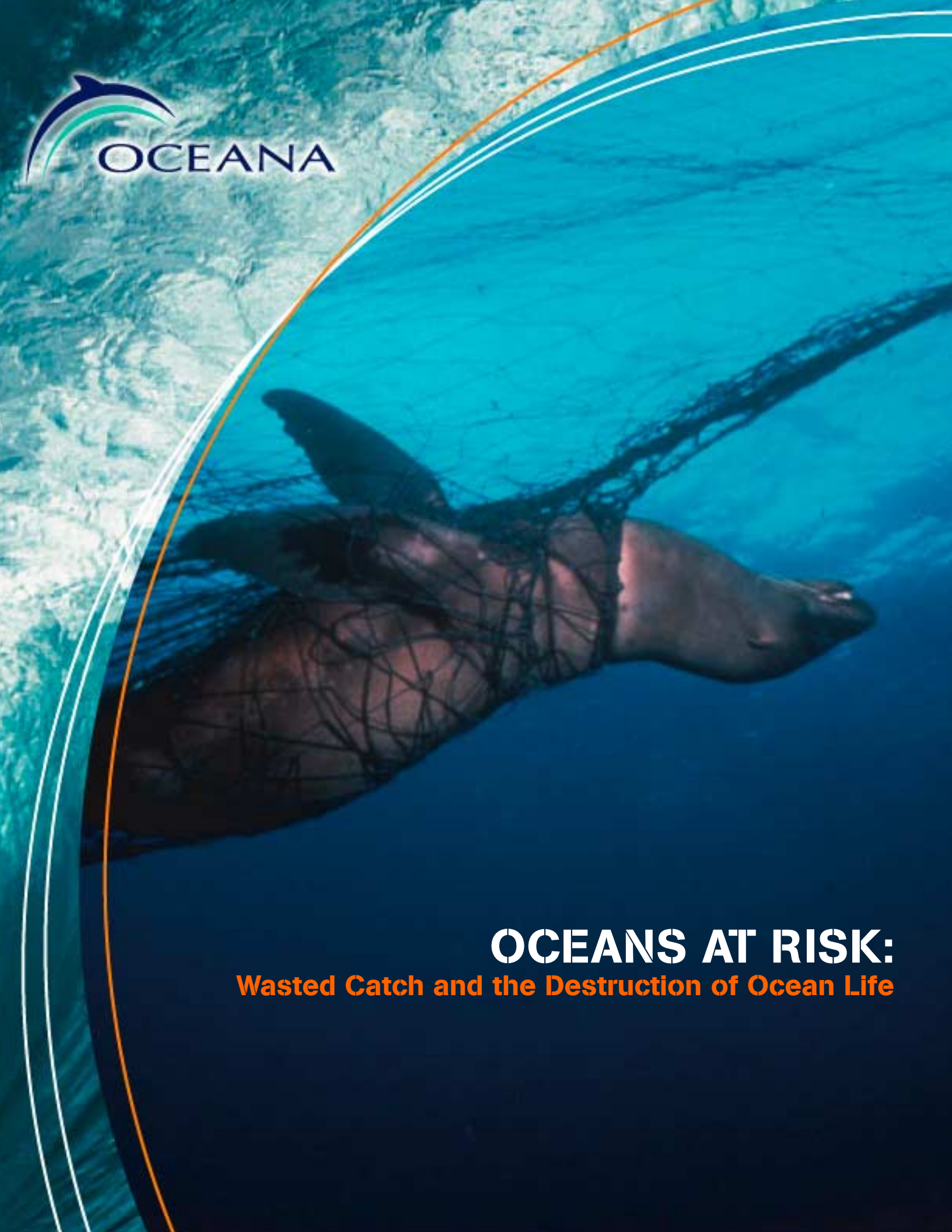

OCEANA

OCEANS AT RISK:

Wasted Catch and the Destruction of Ocean Life

EXECUTIVE SUMMARY

Destructive fishing practices are destroying large portions of our oceans and the life within them. "Wasted Catch and the Destruction of Ocean Life" highlights one particularly devastating problem called bycatch, or wasted catch — the unintended catch and subsequent destruction of unwanted fish and other marine life as a byproduct of fishing practices**.**

Protecting the world's oceans should start here in the United States, where fishing nets strangle, drown, and crush billions of fish, and thousands of sea turtles, whales, dolphins, sharks, and seabirds. Other gears, such as bottom trawls, bulldoze the ocean floor in search of fish, scraping up virtually everything in their path.

But the problem is not unique to the U.S. **Around the world each year an estimated 44 billion pounds of fish are wasted – 25 percent of the entire world catch. Tens of thousands of marine mammals, birds, corals, and other forms of ocean life are also caught and discarded. This massive destruction of sea life puts our oceans at risk, and with them our food supplies, our coastal economies, and even ourselves.**

Unfortunately, the U.S. government fails to carry out laws already on the books to help protect disappearing ocean wildlife and to reduce the numbers of marine animals caught unintentionally during fishing. In particular, the National Marine Fisheries Service (NMFS), the lead federal agency charged with monitoring and reducing bycatch, has failed to bring the nation's fisheries into compliance with federal laws years after Congress passed the law requiring action, and three years after the agency issued a report highlighting the problem. As a result, **Oceana has filed a formal petition to force the agency to fulfill its duties under current U.S. laws that require it to halt waste and mismanagement of our oceans.**

This report by Oceana shows an in-depth analysis of NMFS' most important study of this problem, "Managing the Nation's Bycatch." The study shows a huge gap between the size of the problem on the one hand, and the amount of information NMFS has gathered and the actions it has taken, on the other. Although this 1998 report reveals only the tip of the iceberg, it makes clear the nation's fisheries management plans are not adequate either to monitor the extent of wasted catch or to reduce it. Bycatch has devastated species and ecosystems all over the country – from groundfish in New England, to sea turtles and sawfish in the Gulf of Mexico, to seabirds and deepwater corals in Alaska.

NMFS has done almost nothing to force those responsible, primarily the regional fisheries management councils, to bring their plans into compliance. NMFS has repeatedly approved fishery management plans that fail to adequately address the bycatch problem, and has taken little action to improve the vast majority of out-of-compliance fisheries. When the agency does act, it usually does so only under court order. Similarly, the agency has been slow to enforce the necessary safeguards needed for species protected under the Endangered Species Act and Migratory Bird Treaty Act, such as sea turtles and albatrosses.

Congress has established goals for reducing bycatch of marine mammals to "levels approaching zero." Wasted catch of other forms of marine life also puts our oceans and our circle of life at risk. The government must set similar aggressive bycatch reduction goals for all marine resources, including fish.

Oceana calls on NMFS and Congress to immediately implement the following five critical measures to end wasteful fishing practices, to protect ocean life and habitat.

COUNT: Require adequate numbers of observers on fishing vessels to obtain better data on bycatch.

CAP: Improve fisheries management plans by including mortality from bycatch in estimates of total mortality, and also require hard caps on total fish mortality and bycatch mortality for all fisheries.

CONTROL: Develop, approve and implement bycatch assessment and reduction plans before allowing fishing.

IMPROVE: Amend the Magnuson-Stevens Act to mirror the Marine Mammal Protection Act by establishing bycatch reduction goals to "levels approaching zero."

REPORT: Issue Bycatch Control Reports detailing the status of bycatch in the nation's fisheries on a regular basis.

This report by Oceana also contains regional information, including a map highlighting the effects of bycatch on particular species for different areas off the U.S. coasts. These data demonstrate how seriously bycatch threatens fish stocks and critical marine species.

This indiscriminate destruction of fish and marine wildlife throughout U.S. waters is not only devastating species, but is upsetting the natural balance of the ocean's ecosystems, and causing changes to the web of ocean life that has evolved over the millennia. The removal of marine wildlife and the destruction of their habitat disrupts healthy marine communities in much the same way as clearcutting destroys forests and terrestrial wildlife.

The U.S. government must implement existing laws to reduce bycatch and require fishing methods that are more efficient and clean, stopping ocean waste and destruction. If we do not meet this goal, our oceans will continue to decline precipitously, putting everything that depends on the oceans, including ourselves, at risk.

Life began in the oceans. The oceans sustain life now. Healthy oceans are essential to our own health and well-being. This report is the first in a series documenting destructive fishing practices that not only deplete the ocean of fish, marine mammals, and other ocean life, but also destroy essential habitat and contribute to the overall decline of ocean ecosystems, putting the circle of life at risk.

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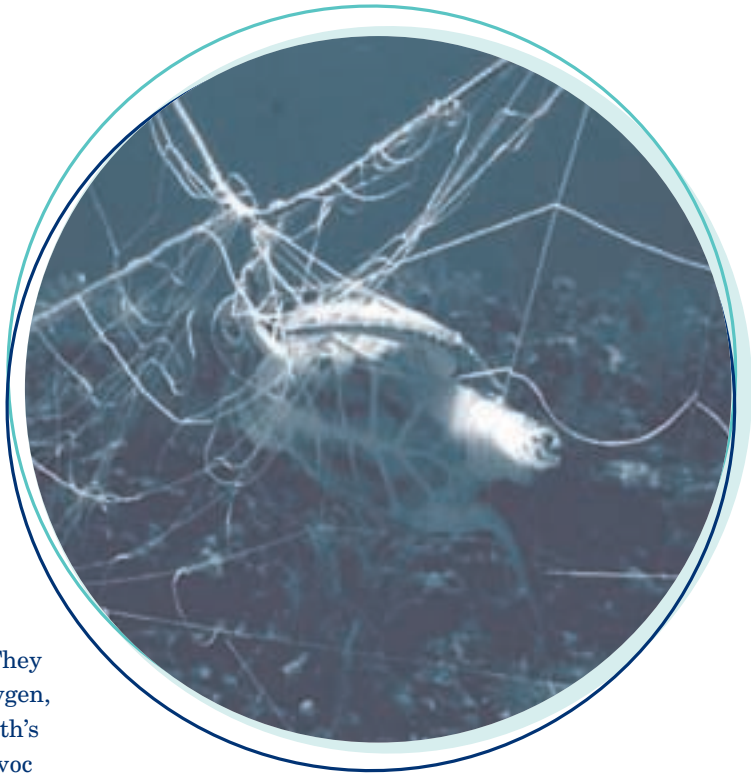
OCEANA is a new, non-profit, international advocacy organization dedicated to protecting and restoring the world's oceans. We bring together dedicated people from around the world, building an international movement to save the oceans through public policy advocacy, science and economics, legal action, grassroots mobilization, and public education.

OCEANS AT RISK:
Wasted Catch and the Destruction of Ocean Life

1. INTRODUCTION



This report is about bycatch, or wasted catch. Both terms describe fishing practices that waste and destroy ocean life, including some of the most endangered species. Bycatch is an enormous problem in commercial and recreational fisheries, threatens ocean ecosystems, and can be economically devastating to fisheries and fishing communities. Minimizing and eliminating bycatch is one of the most challenging—but most urgent—problems we face in the fight to restore and protect the world's oceans.

The oceans, central to human survival, are at risk. They feed billions of people around the world, generate oxygen, and provide 95 percent of the living space for the earth's animals and plants. Sadly, humans are wreaking havoc on the oceans faster than the oceans' unique ecosystems can repair and replenish themselves. According to the United Nations, more than 70 percent of marine fish species worldwide need urgent action to prevent population declines caused by overfishing. Nearly 60 percent of the world's coral reefs are at risk from destructive fishing practices, pollution, and coastal development, and many have already been degraded beyond recovery. Of 126 marine mammal species, 88 have been listed on the Red List of Threatened Species compiled by the International Union for the Conservation of Nature. Declining fish populations, increasing numbers of endangered marine species, and fishing communities under economic strain—all are signs of oceans at risk. As the oceans become increasingly threatened, so does the circle of life that sustains human populations.

"Bycatch," or wasted catch, refers to all the ocean's living things that commercial and recreational fishermen harm or kill even though they don't intend to catch them. Bycatch includes:

- the accidental catch or injury of non-target species—or target species of the wrong size, sex or quality—in the course of fishing operations;
- unobserved deaths caused by fishing, such as the entanglement and death of dolphin or other species in fishing nets that have been lost or discarded in the ocean; and
- marine invertebrates—corals, sponges, anemones—that live on the ocean floor and are caught during bottom trawling, a method of fishing that drags huge nets across the ocean floor.*

Bycatch occurs for two major reasons. First, animals in the ocean often travel together and co-exist in the same habitats—thousands of different kinds in the case of coral reefs, for example. Second, fishermen typically cannot perfectly target the exact size, sex, quality, or species of fish they intend to catch. In fact, a trawl net will scoop up virtually everything in its path.

Increasingly, scientists, fishermen, and conservationists recognize that bycatch is taking a significant toll on the ocean environment. Bycatch kills many different kinds of ocean life, including dolphins, sea turtles, and sharks. Because bycatch is unintended and usually unwanted, it is frequently thrown back into the ocean—too often, dead or dying. Bycatch results in the unnecessary waste of important natural resources. More importantly, it contributes to the destruction of ocean ecosystems through overfishing and deaths of protected species.[1]

2. ENORMOUS LOSSES, A DEVASTATING PROBLEM

Bycatch harms ecosystems through overfishing and killing protected species.[2]

Fisheries' Wasted Catch

Globally, commercial fishermen waste roughly 44 billion pounds of fish each year,[3] equal to approximately 25 percent of the world's total commercial fish catch. Moreover, the actual amount of bycatch is significantly higher than this stunning number. The above figure estimates the wasted catch portion of bycatch, but does not include any estimate of retained catch. In addition, no one has made global estimates of bycatch from recreational fisheries, or subsistence fisheries, or unobserved deaths, such as those in abandoned nets. Finally, these estimates only include wasted catch of fish, and not bycatch of marine mammals, seabirds, or other non-fish species.

Globally, commercial fisheries generate roughly 44 billion pounds of wasted catch each year, including over three billion pounds by U.S. fishermen

"In 1995, 60 factory trawlers discarded nearly as much fish in the Bering Sea as was kept in the New England lobster fishery, the Atlantic mackerel fishery, the Gulf of Mexico shrimp fishery, the Pacific sablefish fishery, and the North Pacific halibut fishery combined. These 60 factory trawlers threw overboard – dead and unused – about one out of every four fish they caught…Last year, the Bering Sea trawl vessels…threw 17 percent of their catch overboard, dead and not used. That total catch…exceeds by almost 500 million pounds the total catch of all five of the major fisheries of the United States…I hope that this bill [the Sustainable Fisheries Act of 1996] will bring a stop to this inexcusable amount of waste."

–Sen. Ted Stevens (R-AK)
(142 Cong. Rec. S10810) 9/18/96

Wasted catch within the United States accounts for a large portion of the total destruction of ocean life caused by overfishing. Assuming the United States' wasted catch rate is comparable to that in the rest of the world (roughly one pound of fish discarded for every four pounds kept), over three billion pounds per year of fish are discarded in U.S. fisheries, with additional and unestimated amounts of retained bycatch. Many fisheries show even higher bycatch rates. In one regional study, scientists estimated that the bycatch in commercial fisheries amounted to between 26 percent and 64 percent of the total catch for six areas along the East Coast.[4]

The United States' recreational fishing community also contributes to the bycatch problem, both by using fishing gear that is not selective, and by catching and releasing species that die once they are thrown back. Along the Atlantic seaboard, the recreational fishing industry throws back at least one fish for every two it brings to shore.[5] While some species may survive recreational catch and release programs, other species (such as Pacific rockfish) cannot withstand the pressure changes resulting from being brought to the surface.[6]

The Threats to Ocean Ecosystems and Ocean Life

The impact of fishing on ocean ecosystems can hardly be overstated. Nineteen prominent scientists recently concluded that "ecological extinction caused by overfishing preceded all other human disturbance to coastal ecosystems, including pollution, degradation of water quality, and anthropogenic climate change."[7] Their study emphasized that harm to one species can have damaging ripple effects throughout an entire ocean ecosystem.

For instance, in the Gulf of Maine, overfishing of dominant predators that eat sea urchins, such as Atlantic cod, caused a population explosion among sea urchins in the 1920s. Because sea urchins eat kelp, the population explosion caused the destruction of the region's kelp forests, leading to faster coastal erosion rates.[8] Similarly, predators may be forced to eat new species, if too many of their prey are killed as bycatch, with potential effects

throughout the ecosystem. Bycatch may also alter ecosystems as a result of the tremendous volume of dead material added as food, potentially causing major disruptions to the food chain.[9]

Alaska Case Study: Alaska Seabirds—Trying to get off the hook

Every year in Alaska, up to 20,000 seabirds drown after attacking baited hooks on the surface as longline gear is deployed. The bycatch of albatrosses in longline fisheries is an especially significant problem because their populations are declining throughout the world.[10] To deal with particular concerns over the endangered short-tailed albatross, regulations were changed in 1997 and 1998.[11] However, deaths of short-tailed albatrosses continued. In late 1998, afraid that additional deaths could lead to a shut-down of the fishery, the North Pacific Longline Association requested the North Pacific Fishery Management Council to act immediately to strengthen protective measures, and the regulations were changed in 1999. In 2001, following the release of a report evaluating alternative approaches to reducing seabird mortality, the Council adopted new regulations reflecting the report's conclusions, which should result in further reductions in seabird deaths.[12]

The Council, scientists and the fishing industry responded to information about short-tailed albatross deaths by testing alternative approaches to bycatch reduction and by implementing regulations. Good information and the threat of a fishery shutdown were also critical to prompt action. Neither the research nor the regulations would likely have occurred without the threat of the Endangered Species Act—despite the fact that over 1000 black-footed and Laysan albatrosses were killed each year in the fishery. In addition, these measures apply only to fisheries under the jurisdiction of the North Pacific Fishery Management Council. As the authors of the report noted, "Mitigation measures…are unlikely to stem the decline in albatross numbers unless adopted comprehensively by all fleets throughout the Pacific."[13]

Deaths due to bycatch can also seriously harm individual species.[14] Long-lived species that reproduce at a late age—such as sharks, marine mammals, sea turtles and some fish species—are especially in danger because they may be killed before they have had a chance to reproduce. For example, the U.S. mid-water longline fisheries (known as pelagic longline fisheries) primarily kill young sea turtles before they breed—which has dramatic effects on the ability of the population to recover.[15] Bycatch may even result in the risk of extinction—as in the case of the smalltooth sawfish, the first marine fish to be proposed for listing as an endangered species.

For some species, such as sea turtles and smalltooth sawfish, bycatch poses the threat of extinction.

Economic Harm

Bycatch also results in economic losses to fisheries and fishing communities. Several studies have looked at the impact of bycatch on fisheries revenues. For example, in 1990, the National Research Council estimated that Bering Sea crab fisheries might lose up to $50 million dollars annually due to discarded undersized crabs.

Northeast Case Study: New England Groundfish Escaping Commercial Extinction

New England groundfish fisheries, which include the region's prized cod, haddock, and yellowtail flounder, have been near collapse for more than a decade. The unwillingness on the part of fishery managers to halt overfishing and reduce bycatch by setting and enforcing maximum targeted catch and bycatch limits is central to the plight of groundfish.

In 1994, stock assessment scientists declared several groundfish stocks "commercially extinct," forcing NMFS to close historic fishing grounds off the coast of Massachusetts, on an emergency basis. Fortunately for groundfish, Congress amended the law in 1996, requiring managers to halt overfishing, assess and minimize bycatch, and protect fish habitats.

Despite the strict mandates in the amended Magnuson-Stevens Act, NMFS approved a fishery management plan in April 2000 that contained no measures whatsoever to assess or minimize bycatch in the New England groundfish fishery, despite the fact that the primary gear used to catch groundfish is the otter trawl, one of the leading bycatch-causing gears in the world.

In December 2001, in a case brought by Oceana and four other conservation groups, a U.S. District Court found the plan unlawful and ordered NMFS to take immediate measures to halt overfishing and assess and minimize bycatch.

Bycatch often includes fish targeted by other fisheries. In the Gulf of Mexico, the principal cause of fishing mortality for red snapper is from shrimp trawl bycatch.[16] Bycatch in the brown shrimp fishery is a major factor in the 90 percent decline in red snapper stocks since the 1970's.[17] Bycatch in the shrimp fishery has kept red snapper numbers low and hurt commercial and recreational red snapper fisheries.

"On the economic front, the tremendous waste of finfish hits two Florida industries hard. It hits commercial fishermen who rely on healthy stocks of finfish like the red snapper in order to make a living. These stocks have been heavily depleted by shrimping nets."

–Rep. Porter Goss (R-FL)
(141 Cong. Rec. H10237) 10/18/95

Not Just a United States Problem

Bycatch is a global crisis. Each day brings new reports of waste and destruction of ocean life. As this report was going to press, headlines in a British newspaper read: "Dolphin Disaster: Awful toll must be halted," referring to bycatch in gillnets (Western Morning News, February 8, 2002). Similarly, a recent report by the American Bird Conservancy identifies the unregulated ("pirate") Patagonian toothfish pelagic longline fishery off South America as responsible for killing thousands of albatrosses.

3. FIRST FEDERAL FAILURE: SKIRTING THE LAW

"When we see the possibility of hundreds of millions of pounds of fish being wasted because of fishing practices that could be avoided, we believe it is time for Congress to act."

–Sen. Ted Stevens (R-AK) (142 Cong. Rec. S10811) 9/18/96

The National Marine Fisheries Service (NMFS) is the federal agency responsible for the management of marine fisheries in U.S. waters. However, instead of protecting the ocean's ecosystem it skirts the four federal laws requiring it to reduce bycatch.

The four federal laws requiring NMFS to reduce bycatch are the Magnuson-Stevenson Fishery Conservation and Management Act (MSA), the Endangered Species Act (ESA), the Marine Mammal Protection Act (MMPA) and the Migratory Bird Treaty Act (MBTA) (See Appendix A for a discussion of the requirements of each of these laws).

None of the 41 fishery management plans developed around the country complies with the law on bycatch reduction.

Two federal courts have found that NMFS defied the will of Congress by refusing to report and assess bycatch.

The Wasted Catch Failure

Through delay, inaction, and inadequate regulations, NMFS has failed to comply with the MSA bycatch requirements added by passage of the Sustainable Fisheries Act (SFA) in 1996. Two federal courts have found that NMFS defied the will of Congress by refusing to report and assess wasted catch. A recent report by the Marine Fish Conservation Network (MFCN) states, "Most of the [fishery management] plan amendments prepared to comply with the bycatch provisions of the Sustainable Fisheries Act failed to create an accurate bycatch reporting system or improve existing reporting systems – even though most Councils recognize that existing plans are inadequate for reporting bycatch."[18]

None of the 41 fishery management plans developed around the country complies with the bycatch provisions of the MSA, despite the fact that NMFS has approved several of them. None of the plans adequately monitors and assesses fisheries bycatch, and none adequately minimizes bycatch in fisheries. Moreover, even NMFS considers that more than 35 percent of fishery management plans are out of compliance with the SFA bycatch requirement. Four of the plans that are not yet in compliance were finally submitted for Secretarial review by the Caribbean Fishery Management Council in January 2002, more than three years after the deadline for compliance. The majority of rejected plans are in the Gulf of Mexico Fishery Management Council region.

Few of the plans that NMFS has rejected have been revised and re-submitted for approval. For example, while NMFS rejected the Gulf of Mexico Fishery Management Council's bycatch fishery management plan amendments more than two years ago, the Council continues to delay implementing adequate measures, claiming that it is waiting for outside sources to provide it with data before it acts.

The most recent evidence of NMFS' failure to take bycatch seriously came in December 2001, in response to litigation concerning the New England groundfish fishery filed by Oceana on behalf of four conservation organizations. The United States District Court for the District of Columbia found that the New England Council's Northeast Multispecies (Groundfish) fishery management plan violated both the bycatch assessment and minimization requirements of the SFA, even though NMFS had approved the plan. The Court ruled that, "by keeping intact the status quo, [NMFS] refuse[s] to give effect to the clear will of Congress, which expressly directed [NMFS] to more accurately measure and reduce bycatch."[19]

In August 2001, the United States District Court for the

Northern District of California reached similar conclusions for the Pacific groundfish fisheries. The court concluded that "The 1996 SFA amendments to the MSA require that NMFS 'establish a standardized reporting methodology to assess the amount and type of bycatch occurring in the fishery and…minimize bycatch.' NMFS has not done this." [20]

Protected Species Without Protection

In the MMPA, Congress required NMFS to submit a report to Congress reviewing its progress toward the goal of reducing marine mammal bycatch to levels approaching zero by the end of April 1998.[21] Nearly four years later, NMFS has still not submitted a marine mammal bycatch report. This delay both violates the law, and demonstrates the agency's failure to evaluate its progress in reducing marine mammal bycatch in commercial fisheries. Even more troubling, NMFS has utterly failed to meet its additional mandate to reduce marine mammal bycatch to insignificant levels by April 2001.[22]

NMFS has failed repeatedly to take the necessary action to minimize takes of endangered species from fisheries. Examples include its years of inaction to protect endangered sea turtles from bycatch by the Hawaii longline fishery, its failure to protect endangered seabirds from bycatch by the Hawaii and North Pacific pelagic longline fisheries, and its failure to increase the size of Turtle Excluder Device (TED) openings for years after its own data showed they were too small to protect many endangered sea turtles.

NMFS' National Plan of Action for reducing seabird bycatch, issued in February 2001, deferred taking any action to address seabird bycatch until a national seabird bycatch assessment had been done. Furthermore, the Plan states that it is a voluntary document, and does not appear to recognize that NMFS has any responsibility to protect seabirds under the MBTA.

4. SECOND FEDERAL FAILURE: INFORMATION AND LEADERSHIP GAPS AT NMFS

An in-depth analysis of NMFS' most important study of the bycatch problem reveals a huge gap between the size of the problem on the one hand, and the amount of information NMFS has gathered and the actions it has taken, on the other.

In 1998, NMFS produced a "National Bycatch Plan," *Managing the Nation's Bycatch*, with the objective: "This bycatch plan is intended to serve as a guide for… NMFS and its cooperators…to current programs and future efforts to reduce bycatch and bycatch mortality of marine resources." The report included a national bycatch assessment, which reviewed the status of the bycatch problem and the actions being taken to address it, and set national objectives to meet the national goal to minimize bycatch.

This 1998 report has never been updated, is no longer available from the agency in either printed form or on the agency website, and there are no current plans to update it. Yet although the information is outdated and publicly unavailable, the report remains the most current national assessment of bycatch.

Oceana conducted an in-depth analysis of the report (and its limitations) to produce the assessment below. It includes statistics from the data tables in the NMFS report.[23] (Oceana's analysis also includes an overall evaluation of the bycatch problem in the United States, the quality of information NMFS has about bycatch, and NMFS' efforts to address the problem.) Chapter 6 discusses examples from selected fisheries in different regions to see what changes (if any) have occurred since the NMFS Bycatch Report.

The NMFS Bycatch Report grouped the country's fisheries into six "regions"—Northeast, Atlantic and Gulf Pelagic, Southeast, Pacific Pelagic and Insular, West Coast, and Alaska—for reporting purposes. A summary of the NMFS Report's findings can be found in Table A.

TABLE A. Summary statistics for each of the Regions described in the NMFS Bycatch Report

PERCENTAGE OF CASES OF BYCATCH IN EACH REGION	NE	SE	ATL	WC	PAC	AK
With Completely Inadequate Information	77	86	59	52	68	13
Where Current Measures are Considered Inadequate	95	100	97	64	94	87
Where No Steps have been taken to Identify Alternative Measures	61	88	50	33	44	7
Where No Action has been taken to Implement Alternative Measures	80	91	61	47	91	22

The Bycatch Problem in the United States

Billions of fish, and thousands of marine mammals, seabirds, and turtles are killed each year as bycatch.

NMFS did not estimate the total amount of bycatch in the United States. In Alaska, NMFS estimated annual discards of 120,000 salmon, 14,000 birds, 8.5 million crustaceans (virtually all crab species), and 19 marine mammals (including walrus, endangered Steller's sea lions—and even one killer whale).

- NMFS only estimated the weight of wasted catch for other species of fish in Alaska—which added up to nearly 700 million pounds.
- Outside of Alaska, NMFS made no estimates for the vast majority of examples of bycatch, which means that the data are too sketchy to give a precise national estimate of bycatch.
- However, simply adding up the numbers in the NMFS Bycatch Report results in an estimate of nearly 20,000 seabirds, over 6000 marine mammals, and 1400 turtles harmed each year—and the true national total is certainly much higher.

According to the NMFS Bycatch Report, NMFS had implemented no new bycatch reduction measures for:

- **90 percent of cases involving sharks,**
- **92 percent of cases involving birds,**
- **73 percent of cases involving turtles,**
- **53 percent of cases involving mammals, and**
- **47 percent of cases involving fish.**

- NMFS only estimated the weight—not numbers—of fish and sharks discarded; the national total added up to well over a billion pounds of fish and over 17 million pounds of sharks.
- NMFS included no estimates of—or even descriptions of—bycatch of other forms of ocean life, such as sponges and corals, in the NMFS Bycatch Report.

nationally.

- Bottom trawls were worst for fish, longlines for seabirds, pelagic longlines for turtles, and gillnets for marine mammals.

NMFS Information About Bycatch

The quantitative information that NMFS produces about bycatch is woefully inadequate.

Current policies meant to solve the bycatch problem are failing to do the job

- NMFS considered current measures inadequate for over 85 percent of cases with bycatch problems in all regions except the West Coast.
- NMFS considered forty percent of current measures adequate on the West Coast; however, later events proved that they were not (see Pacific Rockfish case study in Chapter 6).
- NMFS considered no current measures adequate for the most important cases of marine mammal bycatch, nor for those involving birds, sharks, or turtles.
- For fish, NMFS considered current measures inadequate for 85 percent of the cases involving fully/overutilized species.

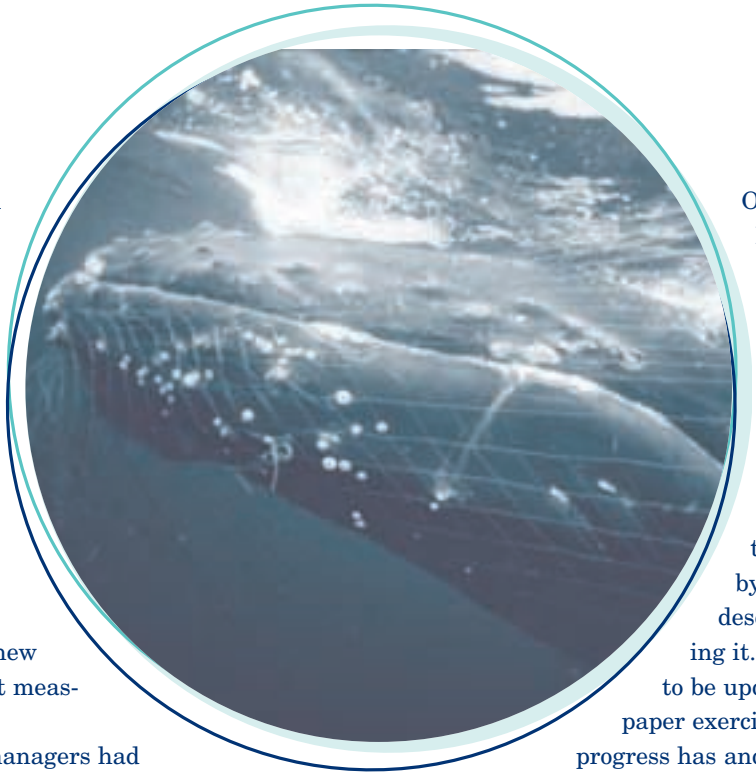
All gear used by commercial fishermen cause bycatch, but bottom trawls and pelagic longlines do the most damage to sea life

- Based on numbers and weight of discards, the gear with the largest totals for the most bycatch categories were bottom trawls and longlines.
- Bottom trawls and pelagic longlines were also the two types of fishing gear associated with the most cases NMFS considered to be of high importance
- Outside of Alaska, NMFS concluded that only two percent of the bycatch cases had statistically adequate information.
- In Alaska, the NMFS Bycatch Report considered 43 percent of all cases to have statistically adequate information.
- More than 50 percent of the cases from each region outside of Alaska are all but worthless, due to a lack of data, while two regions (Southeast and Atlantic and Gulf Pelagic) have poor information for more than 75 percent of the cases.
- Outside of Alaska, over 66% of the cases of seabird, shark, and fish bycatch had statistically poor information.

NMFS' Inadequate Performance

NMFS is not doing nearly enough to address bycatch.

- Managers had taken no steps whatsoever to identify new approaches for dealing with bycatch for 64 percent of the cases outside of Alaska
- Outside of Alaska, managers identified specific management measures or assessed their practicality for only 13 percent of the cases. Nothing whatsoever had been done for 39 percent of cases NMFS considered of high importance.



- Managers had taken no steps to even assess bycatch for 57 percent of shark bycatch cases, 48 percent of those involving mammals, 41 percent involving fish, and 27 percent of those involving turtles.
- Little progress was made to implement new bycatch management measures.
- Outside of Alaska, managers had taken no action for 79 percent of the cases.
- Managers adopted a fishery management plan or regulatory amendment for discard regulation in only 10 percent of the cases outside of Alaska.
- Managers initiated technology transfer and bycatch reduction incentive programs in only nine percent of cases outside of Alaska.
- Managers had put new management measures in place in only two percent of all cases, including adequate enforcement (seven cases) and adequate monitoring (just one case).
- Managers implemented no new bycatch reduction measures for 90 percent of cases involving sharks, 92 percent of cases involving birds, 73 percent of cases involving turtles, 53 percent of cases involving mammals, and 47 percent of cases involving fish.

Overall, the NMFS Bycatch Report and case studies tell a depressing story of death and waste of ocean resources on a massive level.

The NMFS Bycatch Report was a good start towards acknowledging the magnitude of the bycatch problem and describing steps for addressing it. But it is past time for it to be updated—not simply as a paper exercise, but to spotlight where progress has and has not been made. As William Hogarth, the newly appointed NMFS Assistant Administrator, stated recently: "Bycatch issues, including marine mammals and sea turtles, remain a problem in many fisheries because where technological solutions have not been developed, tough choices need to be made that impact the target species fishery."[24] Tough choices indeed need to be made—but if they are not, continued declines in the health of our ocean life are inevitable. Following are a set of policy and program recommendations that should be adopted to reduce bycatch in U.S. fisheries.

After the NMFS Report

Chapter 6 presents brief highlights concerning bycatch in each Region's fisheries are presented, along with a current example of how bycatch issues are being addressed. Because NMFS has not updated the 1998 Bycatch Report, Oceana reviewed articles, reports, court cases, and media reports from any available source.

5. Recommendations for a Cleaner Fishing Future: Count, Cap, Control

Oceana's analysis and assessment indicates clearly that, to protect the oceans, the federal government should:

1) Require adequate numbers of observers on fishing vessels to obtain better data on bycatch and ensure that the observer program is funded.

Experts agree that observers on fishing vessels provide the most reliable information on bycatch. Better data are essential to minimizing bycatch. Despite NMFS' authorities and requirements under the MSA, ESA, and MMPA, observer coverage is minimal in the majority of fisheries. NMFS should determine how many observers are needed to accurately assess and characterize bycatch in each fishery, and then require that level of observer coverage. Furthermore, NMFS should develop mechanisms – such as taxing landings or requiring user fees – to fund observer programs on an ongoing basis so that they are not reliant upon the annual appropriations process. Until such mechanisms are in place, Congress should appropriate the funds necessary to enable NMFS to require observer coverage on enough vessels to collect statistically valid information on bycatch in each fishery.

2) Factor bycatch mortality into total mortality in fisheries management plans, and require hard caps on total mortality and bycatch mortality for all fisheries.

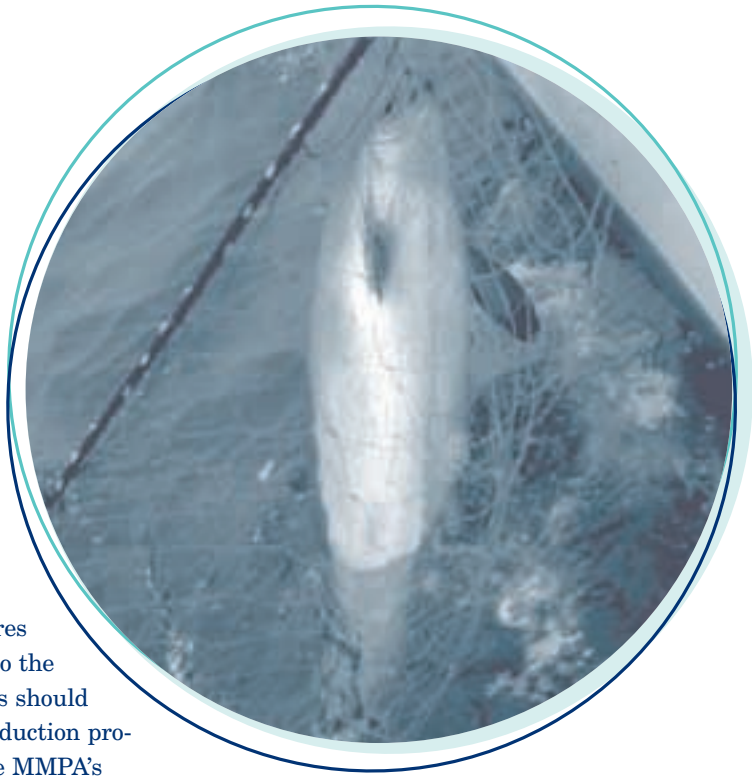
By law, each fishery must stop operating once it reaches its mortality limits, as determined by NMFS. Bycatch is an important component of the total mortality that occurs from fishing.[25] Bycatch should always be accounted for in total allowable catch levels or other fishery mortality limits for each fishery. In order to prevent overfishing and excessive waste, NMFS should set absolute limits for directed catch and bycatch (including fish, marine mammals, endangered and threatened species, seabirds, and all other non-target catch) in each fishery. Fishing should discontinue whenever the fishery reaches the maximum amount set for either the cap on total mortality or bycatch, whichever is reached first.

3) Require development, approval, and implementation of bycatch assessment and reduction plans before allowing fishing.

Despite clear mandates, NMFS continues to authorize fisheries that violate federal law. To halt this senseless and inexcusable waste in fisheries, within 12 months of initiating rulemaking, as described in Oceana's petition for rulemaking filed at the time of this report's release, NMFS should develop, approve, and implement bycatch assessment and reduction plans for all U.S. commercial and recreational fisheries.

Congress established in the MMPA goals for reducing bycatch of marine mammals to "levels approaching zero." To ensure the sustainability of our oceans, similar aggressive reduction goals should be established for all marine resources, including fisheries.

Such plans should include, at a minimum, (a) an assessment of the fishery according to its bycatch, including its types, levels, and rates of bycatch on a per-gear basis and the impact of that bycatch on bycaught species and the surrounding environment; (b) a description of the level and type of observer coverage necessary to characterize accurately total mortality (including bycatch) in the fishery; (c) bycatch reduction targets and the amount of directed and bycatch mortality allowed in each fishery to meet the target; and (d) types of bycatch reduction measures (such as closed areas, gear modifications, or effort reduction) that will be employed in the fishery, including incentives for those who use gears that produce less bycatch. Beginning 12



months after rulemaking commences, NMFS should not permit fishing in any fishery that lacks a functioning bycatch plan.

4) Require bycatch reduction targets in the MSA.

The bycatch reduction mandate in the Magnuson-Stevens Act currently requires that bycatch be minimized to the extent practicable. Congress should clarify the MSA's bycatch reduction provisions – consistent with the MMPA's bycatch reduction goals – to require that bycatch be reduced to insignificant levels in each fishery and to encourage fishery managers and fishermen to develop solutions to reduce bycatch to levels approaching zero.

5) Strengthen bycatch definition.

Congress should close a loophole in the current definition of "bycatch" in the MSA. The current definition applies only to discarded marine life, not to retained marine life. Furthermore, Congress should ensure that the definition of bycatch covers all non-target catch, including living and non-living substrates such as corals and coral skeletons, as well as marine mammals, sea turtles, sharks, fish, aquatic plants, and seabirds. This definition should also account for unobserved deaths from bycatch.

6) Update and publish a bycatch report detailing the status of bycatch in the nation's fisheries on a regular basis.

To enable fisheries managers, Congress, and the public to track bycatch reduction and assessment progress, Congress should require NMFS to produce and make available to the public a regularly updated report assessing and characterizing bycatch in each fishery and the management measures being adopted to minimize bycatch in each fishery.

6. COAST TO COAST EXAMPLES OF BYCATCH

This chapter presents brief highlights concerning bycatch in each Region's fisheries, and describes a current example of how bycatch issues are being addressed. Because NMFS has not updated the Bycatch Report, Oceana reviewed articles, reports, court cases, and media reports.

NORTHEAST Regional Highlights

Lack of adequate bycatch information is a persistent problem in New England. The NMFS Bycatch Report states: "Overall, the level of coverage of observed trips is very low (much less than one percent of the fleet days at sea) and insufficient to generate reliable estimates of discard mortalities for inclusion in stock assessments for all but a few species." [26]

Several years later, not much has changed. For example, the most recent report from the scientists charged with monitoring the health of fish populations expresses serious concerns: "The number of sea sampling observations increased in recent years for the trawl fishery, but remains low …Gillnet sampling is still far below that observed from 1991 through 1993 …There has not been any sampling of the shrimp trawl fishery since 1994…the lack of shrimp trawl estimates remains problematic." [27]

Northeast Case Study: Gulf of Maine Harbor Porpoise—Help was a long time coming

Researchers have acknowledged the serious threat that sink gillnet fisheries pose to harbor porpoise (*Phocoena phocoena*) populations for over 20 years.[28] In the Gulf of Maine, groundfish are targeted with gillnets up to 7,500 feet long in near-shore areas.[29] Harbor porpoises are especially vulnerable to entanglement in the monofilament fishing gear because they prey on many of the commercially targeted fish and are unable to detect the thin mesh net.[30] For 1994 – 1998, the U.S. incidental mortality of harbor porpoises in gillnet fisheries averaged 1,521 animals each year.[31]

As a result, NMFS listed the population as a strategic stock, and convened a take reduction team, consisting of individuals from the government, fishing industry, and conservation community. The team developed a series of plans over several years, and NMFS published the most recent set of regulations in 1998. These regulations included some of the same measures identified by Gaskin in 1984 as possibilities to reduce harbor porpoise bycatch.[32] For example, seasonally, in high bycatch areas, acoustic deterrent devices, or pingers, are required to be placed on nets to alert porpoises to the nets' presence. Although the effectiveness of these devices is still being tested, these "gear fixes" were suggested almost 15 years before NMFS considered any regulatory measures to implement them.

SOUTHEAST Regional Highlights

According to the NMFS Bycatch Report, the Southeast region's information was consistently the worst in the country, with bycatch described in one of only three categories: "undersized target," "other fish" and "endangered/protected"—apparently including all seabird, marine mammal, and sea turtle discards. Although no numerical estimates are included and no species identified, 10 percent of the "endangered/protected" cases were still scored as having information adequate for estimates of discards. That situation persists; according to the official NMFS Observer Program website, observer coverage in the southeast shrimp trawl fishery is much less than one percent.[33]

Bycatch in the Gulf of Mexico shrimp fishery wastes enormous amounts of fish—766 million pounds in 1997 alone. These fish included 8.2 billion croaker, 7.2 billion longspine porgy, and 42 million red snapper.[34]

"Bycatch and waste are currently the greatest threats to the commercial fishing industry…A fish that is caught and thrown back dead does not add anything to the economy. It does not put food on the table. It does not keep the shrimp fishery families in business, and it will certainly not produce generations of fish that will yield economic benefit in the future.

continued on page 18

ALASKA

Every year in Alaska, up to 20,000 seabirds, including the endangered short-tailed albatross, drown after being hooked on longlines meant for fish. Despite a 50 percent improvement, Alaska fisheries still waste more than 300 million of pounds of groundfish each year. The government overlooks bycatch of coral and other invertebrates in Alaska.

WEST COAST

Pacific Rockfish are not only caught in ever-increasing numbers for the market, they are also caught "by accident" in bottom trawl nets. The trawlers scoop up virtually everything in their paths, including adult and juvenile Rockfish, which often don't survive the pressure changes that occur as they are brought to the surface. The government does not know the status of 76 percent of west coast groundfish species.

U.S. OCE

PACIFIC PELAGIC AND INSULAR

The Western Pacific fisheries hook fish, birds, marine mammals and other species on lines intended for swordfish and tuna, but their worst problem is sea turtle bycatch. Four endangered and threatened turtles roam this area, and hundreds drown each year after being caught on baited fish hooks or entangled in fishing line. Government protections for Pacific sea turtles came only after a court order.

OCEANA

KEY

TRAWLER LONGLINE GILLNETS POTS

ANS AT RISK

NORTHEAST

Some Northeast groundfish populations, including the once plentiful cod, are dangerously low. A culprit: wasted catch of juvenile cod, as well as the destruction of their habitats by trawlers. Other species, including about 1,500 harbor porpoises, drown each year after being caught or entangled in sink gillnets placed along the shoreline. The government places observers on fewer than 1 percent of fishing trips in the Northeast.

ATLANTIC AND GULF PELAGIC

Annually, fishing vessels waste more than 600,000 pounds of billfish, 300,000 pounds of bluefin tuna, 1.1 million pounds of swordfish, 48 birds, 200 marine mammals, 1,300 turtles and 48,200 sharks. Blue and white marlin numbers are rapidly dropping because they are frequently caught on lines intended for tuna and swordfish.

SOUTHEAST

Shrimp fisheries waste the most ocean life, throwing away up to 10 pounds of dead and dying creatures for every pound of shrimp kept. More than 766 million pounds of fish are caught and discarded each year in the Gulf of Mexico fisheries. Shrimp trawls without appropriate Turtle Excluder Devices catch and drown hundreds of sea turtles. The government's southeastern bycatch information is the worst in the country.

continued from page 15

Discards represent 80 percent of what the Gulf shrimp fishing industry pulls in over the side. Throwing away 80 percent of what they catch, we cannot sustain that. Something has to be changed. Fifty-thousand 10-ton garbage trucks. That is how many fish are wasted each and every year. We cannot afford that waste."

–Rep. Wayne T. Gilchrest (R-MD): (141 Cong. Rec. H10238) 10/18/95

As harpoon fishing declined in the 1960s, fishermen began using pelagic longlines, indiscriminately catching juvenile swordfish along with sea turtles, marlin, sharks, sailfish, and seabirds.

Southeast Case Study: Smalltooth Sawfish — Innocent Byswimmers

Those who fish in the Southeast have been wary of the smalltooth sawfish (*Pristis pectinata*) since the early 1900's, because it became entangled in their mesh nets and inflicted severe wounds on those who interfered with it.[36] Similar in appearance to sharks, the sawfish has gills, a cartilaginous skeleton, and a long, flat, toothed snout that locates, stuns, and kills prey. The smalltooth sawfish commonly grows to 18 feet long and formerly inhabited coastal waters from Texas to North Carolina.[37] Today, the species has declined to such low levels that the current range is limited to peninsular Florida.[38]

Today, the smalltooth sawfish has declined to such low levels that the current range is limited to peninsular Florida.[35]

In April 2001, NMFS proposed that the smalltooth sawfish be listed as endangered under the Endangered Species Act (ESA). If approved, the sawfish would be the first marine finfish ever to be listed as endangered in the United States. Sawfish have fallen into this dire condition despite the fact that no one deliberately catches them. Bycatch is the primary reason for the species decline, as sawfish were historically caught in large-mesh nets, including gillnets and trawls. Smalltooth sawfish are still occasionally caught in shrimp trawls in Florida.[39] Although the decline of the smalltooth sawfish and its entanglement in fishing gear was well documented by scientists, NMFS took no action until The Ocean Conservancy, an environmental group, petitioned the agency. The proposed endangered species listing is a sober warning that simply being in the wrong place at the wrong time can be enough to send a species towards extinction.

ATLANTIC AND GULF PELAGIC Regional Highlights

Some quantitative information (at least compared to other regions) has been available for the pelagic longline fishery in this region for years. What the data tell is a story of extraordinary numbers of dead and discarded billfish (including marlins), tuna, swordfish, and sharks, not to mention birds, marine mammals, and turtles. The NMFS Bycatch Report describes annual bycatch totaling 600,000 pounds of billfish, 300,000 pounds of bluefin tuna, 1.1 million pounds of swordfish, 48 birds, 200 marine mammals, 1,300 turtles, and 48,200 sharks.

Atlantic Case Study: South Atlantic

Billfish—hooked on lines and sinking

Before the advent of pelagic longlines, fishermen used handgear, such as harpoons, to fish for highly migratory species, sustaining a healthy fishery for 150 years.[40] As harpoon fishing declined in the 1960s, fishermen began using pelagic longlines, indiscriminately catching juvenile swordfish along with sea turtles, marlin, sharks, sailfish, and seabirds. Today, North Atlantic swordfish populations are overfished, and the international community has highlighted the importance of reducing bycatch of juveniles that have not had a chance to reproduce.[41] Similarly, blue and white marlin population levels have been below healthy levels for almost 30 years.[42]

As early as 1995, NMFS identified a known "hotspot" for undersized swordfish bycatch off the Florida East coast. More juvenile swordfish were caught and wasted in this nursery area than anywhere else along the Atlantic coast, even though fishing effort was lower and fewer hooks were in the water. Five years later, NMFS closed several large areas to pelagic longlining to protect juvenile swordfish. While this measure was a large step forward for the protection of swordfish populations, NMFS failed to address the equally critical issue of billfish bycatch, such as blue and white marlin. Although the agency considered closing areas, in the end NMFS adopted a measure that would only reduce billfish bycatch by three percent, a level that could hardly be expected to recover these depleted populations. Clearly, NMFS has the expertise and authority to reduce bycatch in commercial fishing operations, but it is baffling why the agency chooses to protect some species while ignoring others.

WEST COAST Regional Highlights

As in New England, the groundfish fishery in the West Coast suffers from incomplete and inadequate information on bycatch. The NMFS Bycatch Report comments that "with the exception of the mid-water trawl fishery for Pacific whiting, bycatch is not comprehensively monitored or precisely estimated. Lack of a comprehensive at-sea observer program to collect bycatch and other biological data is the main reason information is lacking or estimates are considered to be very "soft'." Not much has changed since then, as demonstrated by this recent statement: "Bycatch is a thorny issue in fisheries management. It really requires an observer program because self-reporting doesn't work very well."[43]

Even more discouraging, of the 82 Pacific groundfish species, NMFS does not know the status of 62 of them.

Astonishingly, for five cases of bycatch in the Pacific groundfish fishery, the NMFS Bycatch Report considered current measures to be adequate, despite the fact that those cases had totally inadequate information. As can be seen from the discussion below, that conclusion could not have been more wrong.

West Coast Case Study: Pacific Rockfish—between a rock and a discard place

Scientists estimate some Pacific groundfish species are at dangerously low levels. For instance, bocaccio is currently estimated at two percent of its historic abundance.[44] Even more discouraging, of the 82 Pacific groundfish species, NMFS does not know the status of 62 of them. Of those Pacific groundfish species that have been assessed, 35 percent are currently classified as overfished or approaching an overfished condition.[45] Overfishing, bycatch, and habitat destruction hit Pacific groundfish particularly hard because they take a long time to reach sexual maturity.

Because these species co-exist at the ocean bottom, fishermen who target one type of Pacific groundfish often incidentally catch several other types. Therefore, bycatch in this fishery is central to its overfishing problems. As a recent court order in response to a lawsuit brought by several environmental organizations against NMFS indicates, NMFS admits that it does not currently have accurate data on bycatch in the Pacific groundfish fishery.[46] Consequently, NMFS has illegally set total allowable mortality rates for the fishery as if there were no bycatch mortality. In August 2001, a U.S. District Court found NMFS in violation of the Sustainable Fisheries Act because it continued to set mortality levels for Pacific groundfish fisheries that did not include any bycatch mortality rates.

Although wasted catch in Alaska has been reduced by roughly 50 percent, it still totals over 300 million pounds of groundfish each year.

PACIFIC PELAGIC AND INSULAR Regional Highlights

The Western Pacific pelagic longline fishery for highly migratory species (primarily swordfish and tuna) has had serious bycatch problems for a long time. The NMFS Bycatch Report notes substantial bycatch concerns for sea turtles, seabirds, and sharks, for example, with over 100,000 of the last taken per year. The NMFS Bycatch Report noted that the blackfooted albatross populations could not continue to sustain the level of mortality caused by the longline fishery at that time.

Pacific Case Study: Western Pacific Sea Turtles—in need of a good lawyer

The Hawaii-based pelagic longline fishery operates year-round in the waters of the Pacific, fishing for tuna, swordfish, and billfish. The fishing grounds overlap with the ranges of four threatened or endangered sea turtle species: the olive ridley (*Lepidochelys olivacea*); the green (*Chelonia mydas*), the loggerhead (*Caretta caretta*); and the leatherback (*Dermochelys coriacea*). Leatherbacks, the second most commonly caught turtle in the fishery, "are on the verge of extinction in the Pacific."[47] Sea turtle bycatch in the pelagic longline fishery can occur in two ways: the turtles may mistake the baited hooks for food and hook themselves in the mouth or stomach, or they swim into the line, entangling their flippers.

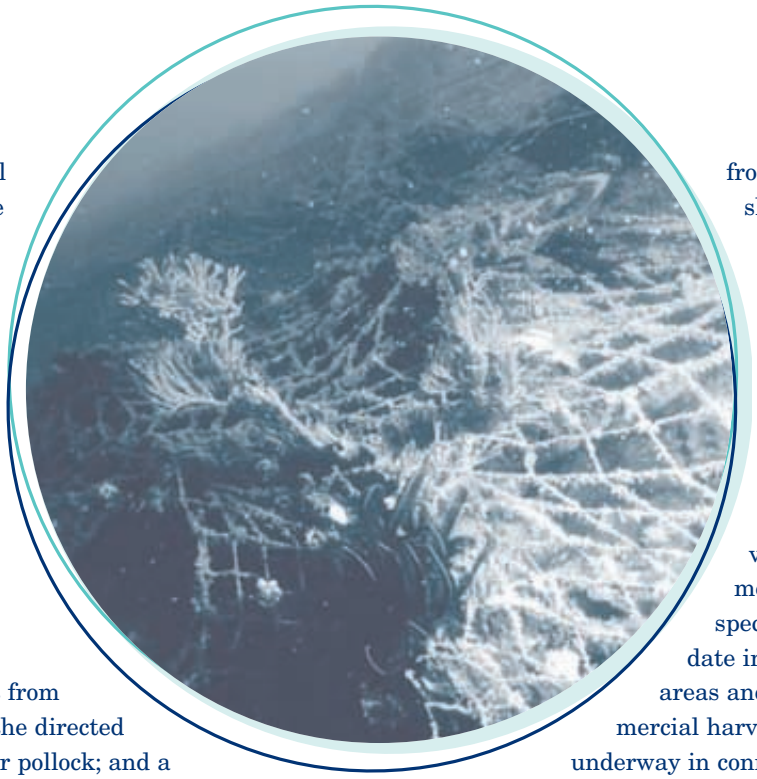
NMFS knew about the incidental bycatch of sea turtles in the longline fishery for several decades, yet failed to gather adequate information about the numbers of animals caught or how to reduce the interactions. Each year, the agency authorized the fishery to take higher and higher numbers of sea turtles until 1999, when several environmental organizations filed a lawsuit. The judge forced the agency to conduct a new environmental analysis to determine the impact that the fishery was having on the sea turtle populations. In the new analysis, NMFS found that the sea turtle bycatch was too much for the populations of these four species to withstand, and it prohibited swordfish fishing gear and restricted tuna fishing based out of Hawaii.[48] Unfortunately, until the court intervened NMFS simply failed to implement the law for years, even though its inaction was severely harming the species.

ALASKA Regional Highlights

According to the NMFS Bycatch report, fisheries in Alaska have made more progress in dealing with bycatch than other regions. However, Alaska handled its cases of bycatch differently from other regions. Other regions generally noted each species of bycatch in the fishery, even if no good information was available. The Alaska data simply do not include certain kinds of bycatch. For example, the bottom longline halibut fishery data include no mention of seabird bycatch, even though the text discusses the concern. Similarly, shark bycatch is not noted in any fishery, even though reducing shark bycatch is an important

goal.[49] These omissions call into question the aggregate statistics in TABLE A.

Bycatch in Alaska's groundfish fishery was recently reviewed.[50] Although wasted catch has been reduced by roughly 50 percent, it still totals over 300 million pounds of groundfish each year.



Furthermore, much of the reduction appears to result from two changes: a closure in the directed Bering Sea trawl fishery for pollock; and a change in regulations resulting in increased retention of bycatch. Wasted catch is still high for many fisheries (many near or greater than 50 percent); and even fisheries with very low wasted catch rates (such as the pollock fishery) can have huge impacts on bycatch species, simply because the fishing fleets are so large and the total volume of bycatch so great.

Alaska Case Study: Alaska Coral—Out of sight, out of mind

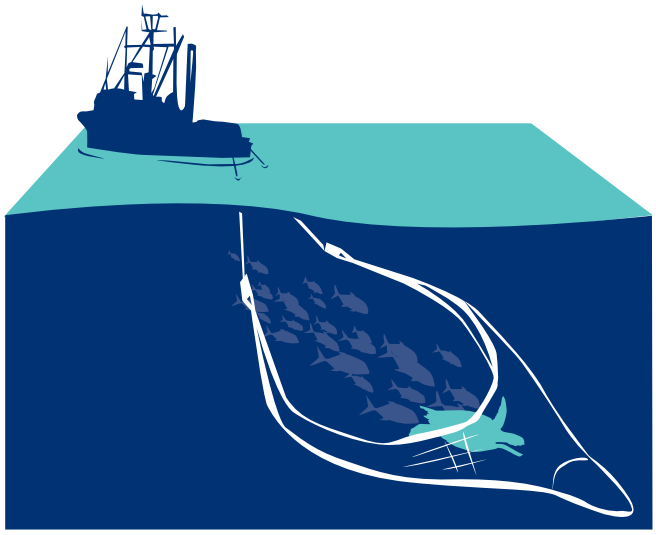
The NMFS Bycatch Report focuses on commercial species—fish, sharks, shellfish—or on species protected by law—i.e., sea turtles, seabirds, and marine mammals. Other types of ocean life become bycatch, too, and the law requires NMFS to minimize bycatch for all forms of ocean life—including corals, sponges, and sea anemones, for example. Despite this requirement, the NMFS Bycatch Report includes no mention of kinds of sea life other than those listed above.

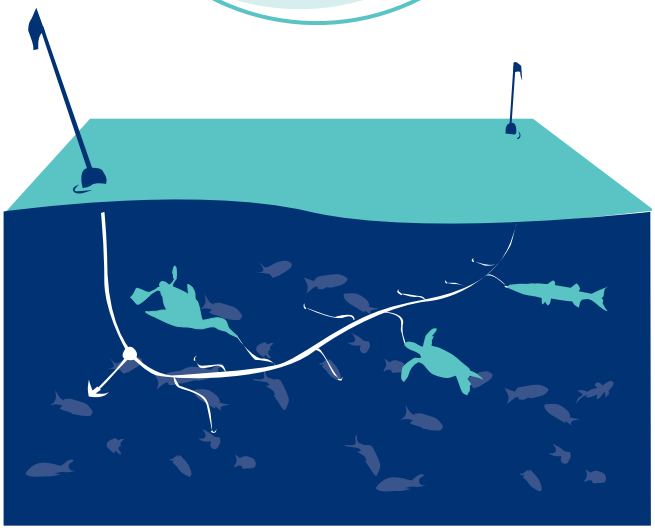
Alaskan coral is emblematic of all the ignored species discarded in our fisheries—species that are critical parts of the ecosystem, but are not considered important because they have no commercial value or high-profile legal protection. Alaska's corals are very vulnerable to damage from fishing gear and are slow to recover. Despite their omission from the NMFS Bycatch Report, deep water corals are a frequent component of bycatch in Alaska.[51] Corals are receiving increased attention from fishery managers, who recognize their role value as habitat for commercially valuable fish species. Actions taken to date include trawl closure areas and a ban on direct commercial harvests; further efforts are underway in connection with the North Pacific Fishery Management Council's (NPFMC) consideration of measures to protect fish habitat.[52] Now that the NPFMC has recognized the importance of coral, it should act rapidly to take additional actions to protect this overlooked part of the ecosystem.

PICTURE THIS: RISKY FISHING GEAR

Bycatch is caused mainly by unselective fishing gear. Although almost all fisheries catch unintended species, certain fishing gear results in more bycatch than others. The selectivity of a fishing gear depends on how well it attracts and captures only the target species. Generally, fishing gear types fall somewhere between the most selective—such as harpoon fisheries, which require fishermen to search for and kill individual fish—to the least —such as shrimp trawls which capture large amounts of bycatch along with the shrimp.

Shrimp trawl fisheries, particularly for tropical species, generate more discards than any other fishery type.[53]





TRAWLS

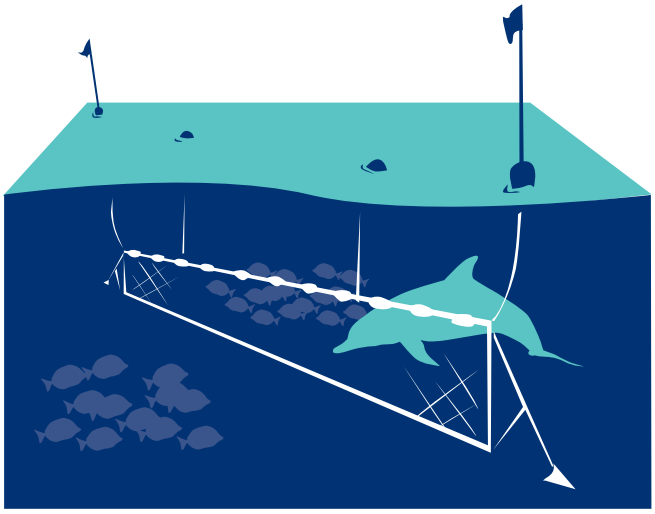
Trawl nets are pulled behind fishing vessels on the ocean floor or in the water column to catch shrimp, fish, and crabs. A trawl consists of a large bag-shaped net, wide at the mouth and tapering toward an enclosed end.[54] Trawls sweep large areas of the ocean floor, capturing virtually everything in their path, including unwanted fish and endangered and threatened sea turtles. The U.S. shrimp trawl fisheries in the Gulf of Mexico and South Atlantic discard up to 80 percent of their total catch by weight.[55]

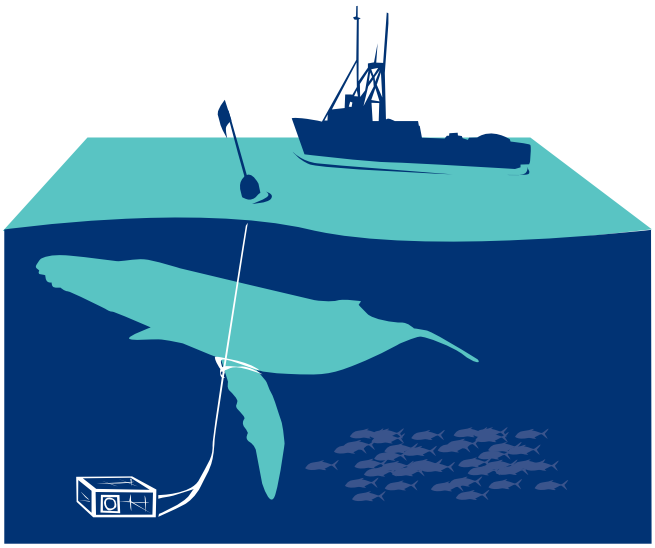
Trawl fisheries produce roughly two percent of the world catch of fish in weight, but result in more than one third of the by-catch." [56]

LONGLINES

Longline fishing gear consists of fishing line from a few hundred feet to several miles long with short lines with baited hooks attached at set intervals.[57] The baited hooks remain in the water for several hours, attracting and hooking targeted fish as well as other ocean life. Longlines are set along the bottom of the ocean (bottom longlines) or floating in the water (pelagic longlines), depending on which species they are targeting. Some longlines regularly catch sharks, seabirds, billfishes (such as blue and white marlins), undersized swordfish, and sea turtles as bycatch. Bycatch on pelagic longlines in particular is currently considered a major factor contributing to the decline of many seabird populations worldwide.[58]

Bycatch on swordfish longlines is typically more than 50 percent of the intended catch.[59]





GILLNETS

Gillnets are large square walls of net weighted on the bottom so that they rise up from the sea floor or are suspended in the water column. Fish (and other species that swim by) swim into the net and become entangled or caught in the mesh.[60] Different net mesh sizes are used to catch different size fish, including sharks, flounder, and reef fish. Many other marine species entangle themselves in these nets. In the Gulf of California, Mexico, local gillnet fisheries are slowly destroying a small population of the vaquita porpoise (*Phocoena sinus*), which is more endangered than any other species of whale or porpoise.[61]

Scientists suspect that the large-mesh gillnet fishery off the coast of North Carolina was at least partially responsible for two different sea turtle mass die-offs: 71 dead turtles in April, and over 200 sea turtles in May 2001.[62]

DRIFTNETS

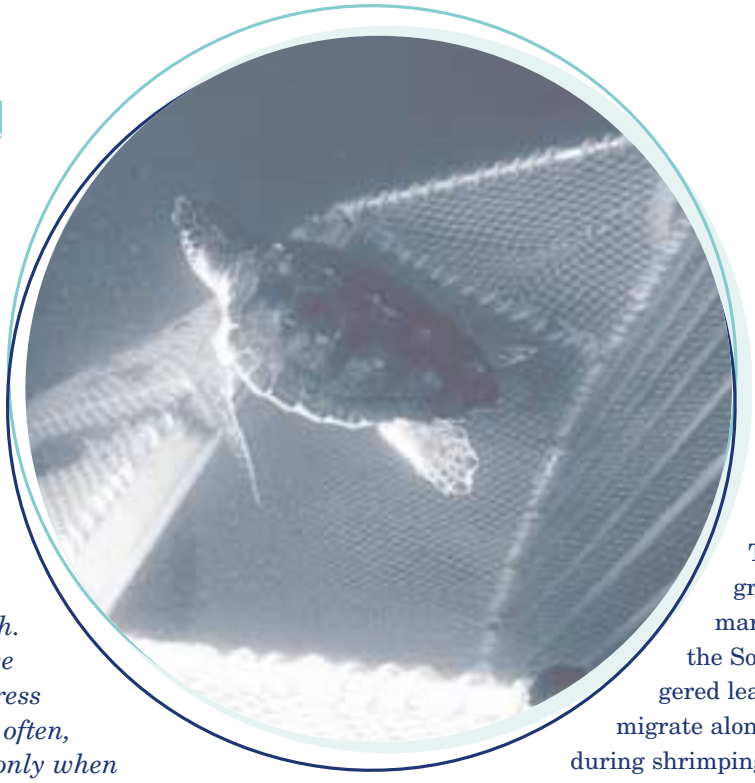
Internationally, large-scale miles-long drift gillnets were widely used in the high seas until the United Nations enacted a global ban in 1991. The year before, these nets entangled 42 million animals that were not targeted, including marine mammals and seabirds.[63] Despite the international ban, illegal drift gillnetting still occurs in the oceans. In 1999, 11 vessels were reported fishing in the North Pacific in violation of the ban.[64]

POTS/TRAPS

Pots are small cages that sit on the sea floor and lure fish and crustaceans to enter and become trapped. Each pot is attached to a vertical line and buoy that marks its position on the surface.[65] After a set amount of time, the catch is brought up one pot at a time, often allowing bycatch in the pots a better chance at survival. However, marine mammals can also be caught in pot fisheries because they become entangled in the line that connects the pot to the surface buoy. Fish traps and pots further contribute to the bycatch problem when the lines that set them break and they are abandoned on the ocean floor. Sometimes the traps continue to "ghost fish" for years after they are deployed.

Pot line entanglements are especially serious for the North Atlantic right whale, one of the most endangered species in the world.[66]

7. CONCLUSION



Billions of fish, and thousands of marine mammals, birds, and turtles continue to be killed each year in U.S. fisheries as bycatch. Unfortunately, in too many cases, no steps at all, or only the smallest of steps, have been taken to stop bycatch. Even where concerns have been high for years, progress has been meager. All too often, progress has been made only when conservation organizations have sued to enforce the law. Lack of precise information simply cannot be used as an excuse for inaction any longer. We will never be able to stop overfishing until we control wasted catch; we will never see recovery of protected species until we protect them from bycatch.

We Can Reduce Bycatch

Over the past several decades, managers, scientists, and the fishing industry have identified strategies and gear modifications to avoid and reduce bycatch. Reductions in bycatch can be achieved through reducing overall fishing effort, improving gear technology, changing fishing practices, limiting fishing time, or closing areas to fishing.[67]

Changes to fishing gear—for example by adding bycatch reduction devices (BRDs)—can significantly reduce bycatch. The use of turtle excluder devices (TEDs) in shrimp fisheries has significantly reduced turtle deaths compared to pre-TED levels, although improvements in design still need to be made. Similarly, the use of the Nordmore grate (an example of a BRD) in northern shrimp fisheries has reduced bycatch of fish.[68]

Southeast Case Study: Sea Turtles—still struggling to escape

Shrimp trawls catch much more than just shrimp. Towed for hours, they catch millions of pounds of fish as well as endangered and threatened sea turtles. In the Gulf of Mexico, endangered Kemp's ridley sea turtles must cross Texas shrimp fishing grounds to get to their primary nesting beaches. In the South Atlantic, endangered leatherback sea turtles migrate along the Atlantic seaboard during shrimping season.

NMFS first addressed sea turtle bycatch in trawl nets in 1978, when the agency developed an escape hatch, called a turtle excluder device (TED), to fit in trawl nets. However, it wasn't until legislation was passed in 1994 that NMFS required TEDs year-round.[69]

The required escape hatches seemed to work for the smaller Kemp's ridley sea turtles, and the nesting population numbers of this species continue to increase[70], but the escape opening has proven to be too small for adult loggerhead and green sea turtles[71] and leatherback sea turtles.[72] Although NMFS proposed increasing the size of the TED to allow these larger turtles to escape in 2001, the size NMFS has proposed may still be too small.

The turtle excluder device is a good example of how gear modifications can reduce bycatch. However, hundreds of endangered and threatened turtles have died—and continue to die—because NMFS chronically drags its feet on proposing regulations even where a technological fix is available.

Most effective bycatch reduction programs involve changes in both technology and fishing practices.[73] For example, the recently-announced regulations to address seabird bycatch in Alaska longlines include modifications to the gear itself, modifications to gear deployment, and changes in operations.[74] Bycatch reduction programs are also more successful when the fishing industry is involved in designing solutions.[75]

Appendix A: Bycatch reduction requirements in United States Law

Congress has enacted several laws that require the avoidance and reduction of bycatch during the course of fishing operations. Bycatch reduction responsibilities fall, for the most part, on the National Marine Fisheries Service. NMFS must issue regulations to apply federal law to individual fisheries and enforce federal bycatch law. The agency is required to adopt and implement plans and strategies to avoid and/or reduce bycatch of fish and of protected species including marine mammals, seabirds, and endangered species (e.g., sea turtles). Below are brief descriptions of NMFS' bycatch reduction responsibilities under the Magnuson-Stevens Fishery Conservation and Management Act (MSA), the Marine Mammal Protection Act (MMPA), the Endangered Species Act (ESA), and the Migratory Bird Treaty Act (MBTA).

1. Fish Bycatch

Magnuson-Stevens Fishery Conservation and Management Act

The MSA, 16 U.S.C. §§ 1801-1883, establishes a regulatory framework intended to allow for sustainable commercial and recreational fisheries. The Act defines "fish" to include finfish, mollusks, crustaceans, and all other forms of animal and plant life other than marine mammals and seabirds. 16 U.S.C. § 1802(12). Under the MSA, NMFS regulates fisheries through plans, called fishery management plans (FMPs), that are implemented by specific regulations. These plans and regulations must be consistent with 10 national standards. [*Id*. § 1851]. In addition, the MSA specifies conservation provisions that FMPs must include. [*Id.* § 1853(a)].

While NMFS had authority to regulate bycatch dating back to the 1976 passage of the Act, NMFS did not effectively exercise that authority. Accordingly, Congress added explicit bycatch reduction requirements to the MSA in enacting the Sustainable Fisheries Act Amendments of 1996 (SFA), (Pub. L. No. 104-297, 110 Stat. 3559 (1996)). The SFA added National Standard 9 to the Act, requiring that, "Conservation and management measures shall, to the extent practicable, (a) minimize bycatch and (b) to the extent bycatch cannot be avoided, minimize the mortality of such bycatch." (16 U.S.C. § 1851(a)(9)). The SFA also added a requirement that FMPs minimize bycatch and bycatch mortality. [*Id.* § 1853(a)(11)]. Therefore, any fishery management plan (FMP) or fishery regulations prepared to implement an FMP must contain measures to minimize bycatch in fisheries to the extent practicable.

The SFA also added a provision requiring NMFS to establish a standardized bycatch reporting methodology to assess the amount and type of bycatch occurring in each fishery. [16 U.S.C. § 1853 (a)(11). Hence, NMFS must accurately document and characterize the total amount of target and non-target catch that is caught in each fishery. Thus, NMFS should have implemented a program, including independent at-sea observers, to account for bycatch and bycatch mortality. Congress set a deadline of October 1998 for NMFS to amend FMPs to comply with the SFA. [Pub. L. No. 104-297 § 108(b), 110 Stat. 3575].

2. Protected Species Bycatch

The conceptual basis of federal fisheries law is that killing and consuming fish is in the national interest, but must be done sustainably. In contrast, Congress has emphasized in legislation to protect specific species that it is unacceptable to harass or kill marine mammals, endangered species, or migratory birds. The fundamental notion in this area of federal law is a restriction on the "take" or "taking" of the species. For example, the Endangered Species Act defines "take" as meaning to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct." 16 U.S.C. §1532(19). The protected species statutes prohibit takings, but contain mechanisms allowing for some level of "incidental" takings in certain activities.

Endangered Species Act

Bycatch poses a serious threat to numerous threatened and endangered species.

The ESA prohibits takes of endangered species – species that have been found to be in danger of extinction. [16 U.S.C. §§ 1532(6); 1538(a)]. The Act also provides for the protection of threatened species, those which are likely to become endangered. *Id.* § 1532(20). After a marine species is listed as endangered or threatened, NMFS

species is listed as endangered or threatened, NMFS must prepare and implement a recovery plan meant to guide regulatory efforts to recover the species. [16 U.S.C. § 1533(f)].

The ESA requires federal agencies to ensure that their activities do not jeopardize the continued existence of any endangered or threatened species. [*Id.* § 1536(a)(2)]. This includes fishing activities. Thus, NMFS is required to issue a "biological opinion" to determine whether a fishery is likely to jeopardize the continued existence of the listed species. [*Id.* § 1536(b)(3)(A)]. If NMFS finds that a fishery is likely to jeopardize a listed species, it must develop measures that would allow the fishery to go forward without jeopardizing the species. [*Id].* For example, NMFS might close a known sea turtle "hotspot" to shrimp trawl fishing to prevent the bycatch of endangered sea turtles.

Marine Mammal Protection Act

Many commercial fishing operations have unacceptably high levels of marine mammal bycatch. The MMPA, 16 U.S.C. §§ 1361-1421h, establishes a "moratorium" on takes of marine mammals [*id.* § 1371]. The Act allows the accidental take of marine mammals, but creates a regulatory system that requires the avoidance and minimization of takes. Specifically, the MMPA provides that "it shall be the immediate goal [of the MMPA] that the incidental mortality or serious injury of marine mammals occurring in the course of commercial fishing operations be reduced to insignificant levels approaching a zero mortality and serious injury rate" by April 2001. [*Id.* at § 1387(a)(1)].

To achieve this goal, the Act requires NMFS to assess regularly marine mammal populations, categorize fisheries according to how often they take marine mammals, and develop and implement "take reduction plans" for those fisheries that take marine mammals that are considered depleted. [16 U.S.C. §§ 1383, 1387].

Migratory Bird Treaty Act

Seabird bycatch is a particularly serious problem in some longline fisheries. As discussed in this report, more than 20,000 seabirds die annually in the Alaskan longline fishery alone.[76]

The Migratory Bird Treaty Act, 16 U.S.C. §§ 703-712, prohibits taking any migratory bird, including seabirds, except as permitted by regulations issued by the Department of Interior. [*Id.* § 703, 704]. In its Waterbird Bycatch Policy Statement, the U. S. Fish and Wildlife Service states that its goal is the "elimination of waterbird bycatch in fisheries." NMFS is required to ensure that its fishery management actions comply with the MBTA. 16 U.S.C. § 1854(a)(1).[77] Therefore, NMFS must monitor and report the bycatch of seabirds that occurs in fishing operations. Additionally, the agency must take steps to reduce seabird bycatch.

* The National Marine Fisheries Service (NMFS), the federal agency responsible for the management of marine fisheries in U.S. waters, defines bycatch as "the unintended capture or

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mortality of living marine resources as a result of a direct encounter with fishing gear". This definition of bycatch includes both non-target species that are kept (often called "incidental catch") as well as those that are thrown back into the ocean (often called "discards"). It is important to pay attention to descriptions of so-called bycatch reduction efforts. Frequently, these refer to "discard reductions,"—simply keeping the part of the catch that had been thrown away. Reducing bycatch by keeping non-target species may reduce waste, but does nothing whatsoever to reduce the impacts on the ecosystem.

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