



Stranded, dead sperm whale with broken jaw from escape attempts. New York, USA. © WWF-Canon / William W. Rossiter

Dolphins, marine turtles, seals, seabirds, sharks, juvenile fish, fish with little commercial value, corals ... billions of unwanted animals are caught every year by fishing boats then discarded dead or dying back into the ocean. Known as bycatch, the incidental capture of these so-called “non-target species” is a major fisheries management problem, wasting time and hundreds of millions of dollars in damaged gear and inefficient fishing methods. It’s also one of the greatest threats to the marine environment, wasting a valuable natural resource and causing dramatic declines in populations of many marine species. As such, WWF is working on bycatch as a priority conservation issue.

What’s the problem?

Since the development some 50 years ago of cheaper fishing gear and bigger, faster boats, thousands of kilometres of nets and lines have been set in the world’s oceans each day. Modern fishing gear, often invisible to sight and extremely strong, is very efficient at catching the desired fish species — as well as anything else in its path. Other fish species, juvenile fish, seabirds, marine turtles, dolphins, porpoises, small whales ... a staggering amount of marine life is hauled up with the catch, and then usually discarded overboard dead or dying.

The numbers are truly frightening. For example:

- Around a quarter of all animals caught in fishing gear are thrown away as bycatch — amounting to more than 20 million metric tonnes of marine life wasted each year
- Over 300,000 small whales, dolphins, and porpoises die from entanglement in fishing



© WWF-Canon / H el ene Petit

nets each year, making bycatch the single largest cause of mortality for small cetaceans and pushing several species to the verge of extinction

- Over 250,000 endangered loggerhead turtles and critically endangered leatherback turtles are caught annually on longlines set for tuna, swordfish, and other fish
- 26 species of seabird, including 17 albatross species, are threatened with extinction because of longlining, which kills more than 300,000 seabirds each year
- 89 per cent of hammerhead sharks and 80 per cent of thresher and white sharks have disappeared from the Northeast Atlantic Ocean in the last 18 years, largely due to bycatch
- Shrimp trawlers catch as many as 35 million juvenile red snappers each year in the Gulf of Mexico, enough to have an impact on the population

Wherever there is fishing, there is bycatch. And the sheer numbers of animals being needlessly killed makes bycatch one of the greatest and most pervasive threats to life in the oceans.

Although some responsible fisheries have begun to tackle the problem, the overwhelming trend is one of inaction, inertia, or severe lack of resources — from small-scale artisanal fisheries to large commercial international operations. Unless this changes, bycatch could well be the final nail in the coffin for many endangered marine species. On top of this, with so many fish, including juvenile fish, being wastefully discarded, bycatch is contributing to the global problem of overfishing and declining marine ecosystem health, and endangering food security in poorer countries.

So what's the answer?

There is growing acceptance by fishing industry leaders of the need to reduce bycatch. Proven solutions do exist, while many more are in development. Usually, the best innovations come from fishers themselves. Many fisheries, governments, and non-governmental organizations (NGOs) are now seeking to magnify and replicate existing solutions and develop new ones.

WWF and its partners are key players in this effort. We are working with fisheries to develop, test, and implement new fishing gear that reduces bycatch. We are also working to integrate conservation into effective fisheries management, strengthen legislation on bycatch, and raise consumer awareness about sustainably caught fish.

The aim is to encourage sustainability in the world's fisheries, by working with all those involved — fishers, consumers, the seafood industry, and governments — to provide practical solutions to counteract the enormous environmental harm that bycatch is causing.

Examples of WWF's work on bycatch

In 2004, WWF created a Global Bycatch Initiative as part of our work on species conservation and sustainable fisheries. The initiative works with academia, the fishing industry, other conservation organizations, and governments to stimulate new solutions and promote them worldwide. The work particularly focuses on priority species, fisheries, and fish populations affected by bycatch.

1. Selective fishing gear

Bycatch mortalities can often be reduced by modifying fishing gear so that either fewer non-target species are caught or non-target species can escape. In many cases, these modifications are simple and inexpensive. WWF and its partners are working with fisheries across the world to test and implement new types of fishing gear. For example:

- **Turtle excluder devices (TEDs).** WWF assisted in initial TED trials in Mozambique, and in 2003 helped make their use compulsory in the country's shrimp trawl fleet. TEDs are metal grids that allow shrimp to pass into the main part of the net, but allow up to 97 per cent of marine turtles to escape with only a minimal reduction in shrimp catch. As well as saving the lives of up to 5,000 marine turtles per year, the use of TEDs will allow Mozambican fishers to sell their shrimp to the US market.
- **Circle hooks.** WWF is working with the Inter-American Tropical Tuna Commission (IATTC) and other partners to introduce a new type of hook in eastern Pacific longline fisheries that reduces marine turtle deaths by as much as 90 per cent without adversely affecting catches of swordfish and tuna. The new "circle" hooks are much less likely to be swallowed by turtles than traditional J-shaped hooks, which cause suffocation or internal bleeding when swallowed. Circle hooks are also easier to unhook from a snagged animal. Mustad, the world's largest fishing hook manufacturer based in Norway, and the US National Oceanic and Atmospheric Administration (NOAA) have donated over 250,000 circle hooks to WWF for trials in the East and West Pacific Ocean. WWF is also helping with the testing of different

types of fish bait, the use of de-hookers, and training in turtle release techniques in these fisheries.

- **Deeper setting of longlines.** WWF awarded first prize to an invention designed to minimize bycatch of marine turtles by Pacific Island tuna longline fishers in the 2005 International Smart Gear Competition — a global competition launched in 2004 by WWF and an unprecedented partnership of fishers, industry leaders, and scientists to find the most practical, innovative design for fishing gear that reduces bycatch mortality. The invention involves a simple mechanism to set baited hooks on the longline at depths below 100m. It is based on the observation that turtles, as well as sharks and other non-target species, are often caught on hooks above 100m while tuna are caught on hooks deeper than 100m.
- **Avoidable, detectable, safer gillnets.** WWF awarded a runner-up prize in the 2005 International Smart Gear Competition to an invention designed to allow cetaceans and other marine mammals to avoid gillnets and, if they do become trapped, to escape more easily. The nets are chemically tagged to make them more acoustically detectable by whales, dolphins, and porpoises using echolocation. They are also stiffer which makes them less likely to entangle cetacean fins, flippers, and tails. The nets additionally incorporate glowing float lines to help visually deter marine mammals, and break more easily enabling entangled cetaceans to get free.
- **Selective shrimp trawling.** WWF awarded a runner-up prize in the 2005 International Smart Gear Competition to an invention designed to reduce bycatch of undersized shrimp and fish by Indian shrimp trawlers. Using a system of metal grids and net meshes, the trawls trap mature shrimp in the bottom portion of the net while allowing juvenile shrimp to swim away unharmed. The device also retains mature fish in the upper portion of the net while allowing small juvenile fish to swim away. The invention also enhances profitability by sorting the shrimp and fish between the lower and upper parts of the net.

WWF also supports other groups that similarly work with fisheries to test and implement new types of fishing gear, such as SeaNet (Australia), Southern Seabird Solutions (Southern Ocean), and the Agreement on the International Dolphin Conservation Programme (AIDCP; Eastern Tropical Pacific Ocean). ▶



Hector's dolphin calf killed in gillnet. Banks Peninsula, New Zealand.
© WWF-Canon / Stephen Dawson

2. Integrating fisheries management with conservation

In all its conservation work, WWF promotes Ecosystem-Based Management — which aims to balance the social and economic needs of human communities with the maintenance of healthy ecosystems. In the case of fisheries, this means promoting new, innovative forms of management that conserve fish populations, reduce bycatch, protect the structure and function of marine ecosystems, and support sustainable fisheries and the fishers that depend on them.

WWF and its partners are working with fisheries and fishers around the world to research and implement changes to fisheries that achieve these goals. As part of this work, WWF promotes no-take zones, Marine Protected Areas (MPAs), and sanctuaries in priority areas to help reduce bycatch and allow fish populations to recover.

For example, WWF is supporting Turkish artisanal fishers to create no-take zones around breeding caves for the endangered Mediterranean monk seal to help prevent young seals from drowning in fishing nets. This not only protects the seals: fish populations are also increasing in and around the no-fishing zones. At the international level, WWF is advocating for Marine Protected Areas on the High Seas — the 64% of the ocean that lies outside of any nation's jurisdiction — that encompass, for example, key migration routes for marine turtles and breeding areas for cetaceans.

In cases where bycatch is an immediate threat to the survival of a species or ecosystem and existing legislation is not sufficient to prevent this, WWF will work to ban certain fishing gear. For example, a campaign in 2003 led to a ban on setting gill nets in inshore waters on New Zealand's North Island to protect the critically endangered Maui's dolphin — the world's smallest and rarest marine dolphin, whose numbers have been severely depleted by set gill net fishing. Similarly, in 2004 WWF successfully advocated for a ban on bottom-trawling on several cold-water coral reefs in the North East Atlantic Ocean, thus protecting these fragile, newly discovered ecosystems from being destroyed.

3. Policy work

In order to secure long-term success, policy and legislation for reduced bycatch must be in place at national and international levels. WWF is therefore working with governments and fisheries to strengthen and enact legislation, treaties, and agreements on bycatch. Examples of this work include:

- **Working with fisheries and their management agencies.** WWF works with many national, regional, and international fisheries management bodies on bycatch issues. These include the North East Atlantic Fisheries Commission and the International Commission for the Conservation of Atlantic Tunas. WWF also works with a number of fisheries around the world. For example, WWF is supporting gillnet fisheries in Argentina to reduce coastal dolphin bycatch, and improving the selectivity of fishing nets in small-scale fisheries in northern France.
- **Advocacy.** For example, WWF is urging authorities in Mexico to take emergency measures to stop further drownings of vaquitas, the world's smallest and most critically endangered porpoise, in fishing nets.
- **Mobilizing funding.** In many cases, the problem with regional and international efforts to reduce bycatch is that governments are not implementing existing regulations and frameworks — not necessarily due to a lack of political will, but often a lack of funding. WWF is therefore looking at ways to mobilize funding for such implementation.
- **Influencing international fora.** For example, WWF is a member of the OECD Ministerial Task Force on Illegal, Unregulated, and Unreported (IUU) Fishing, which, by tackling the huge problem of IUU fishing, will also help reduce bycatch. WWF also worked successfully for the International Whaling Commission (IWC) to start tackling cetacean bycatch.
- **Bringing experts together.** For example, in 2002 WWF sponsored an International Workshop on Reducing Cetacean Bycatch, which brought together cetacean and fisheries experts from six continents leading to the creation of a bycatch taskforce. WWF also helped organize a 2005 workshop that brought together the world's leading experts on longline bycatch mitigation for different species (turtles, seabirds, cetaceans, sharks) in order to improve communication and collaboration, and create a global approach to reduce longline bycatch.
- **Carrying out research.** WWF and its partners perform cutting-edge research on fisheries and bycatch to help governments and the fishing industry keep abreast of new trends and to react accordingly. For example, a WWF report on the Moroccan driftnet fleet and its devastating effect on dolphin populations led to a total ban on the use of driftnets in the Mediterranean Sea.



Silky shark caught on a longline hook, Fiji. © Cat Holloway



A green turtle, accidentally caught in fishing gear, is released into the Indian Ocean. Mafia Island, Tanzania. © WWF-Canon / Stephen Dawson

4. Raising awareness

Many local fishers, particularly those in poorer countries, are not aware of the devastating impact of bycatch. At the other end of the chain, consumer demand for sustainably harvested fish can act as an extremely powerful market incentive for better fisheries management. Examples of WWF's work to raise public awareness of the issue include:

- **Certifying sustainable fisheries and seafood products.** In 1996, WWF and Unilever, one of the world's largest food companies, formed the Marine Stewardship Council (MSC), which certifies sustainable fisheries to provide consumers with a choice in the marketplace. The certification process includes a management framework for fisheries to reduce bycatch and other ecological impacts of fishing.
- **Working with local communities.** For example, a WWF campaign on juvenile fish in West Africa reached 70 per cent of the region's fishers and achieved a 60 per cent reduction in the bycatch of juvenile fish in just a few months.



Bycatch entangled in the net of a tuna fishing boat, Atlantic Ocean. © WWF-Canon / H el ene Petit



Discarded catch by deep-sea trawler being kicked overboard, North Atlantic Ocean. © WWF-Canon / Mike R. Jackson

Find out more...

This fact sheet has been designed to give a broad overview of the environmental harm that bycatch can cause, and to give examples of WWF's work and solutions on the ground. For more detailed information on species, oceans, fisheries, WWF, and the work we do, please visit www.panda.org/species and www.panda.org/marine

Take action...

Visit www.passport.panda.org to find out how you can take action to help protect this and other species and fragile environments.



for a living planet®

www.
panda
.org/species

WWF International
Avenue du Mont-Blanc
CH-1196 Gland
Switzerland

tel: +41-22 364 9111
fax: +41-22 364 0640