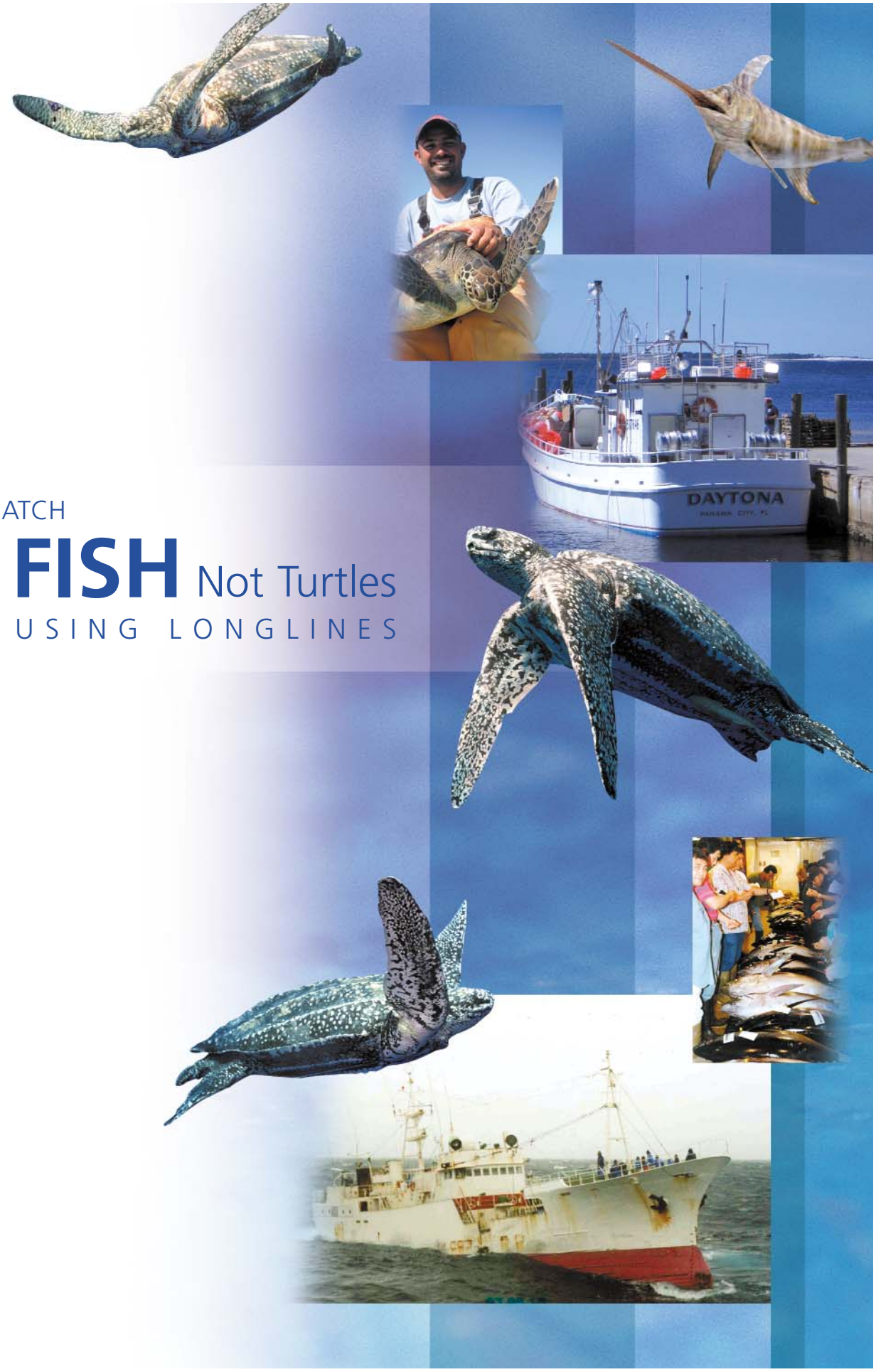
CATCH

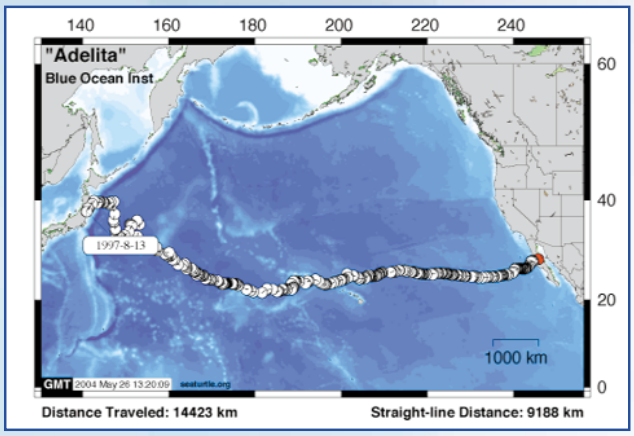
FISH Not Turtles

USING LONGLINES



Protecting Sea Turtles, Saving Your Livelihood

Sea turtles are valued by people around the world. They are a symbol of longevity, fertility, strength, and protection from harm. They are often a valuable eco-tourism attraction. In spite of this, sea turtle populations are declining due to hunting, disturbance of nesting habitat, marine pollution, predation, and incidental catches in fishing gear, including shallow-set "pelagic" longlines, trawls, and gillnets. This booklet presents ways to minimize interactions between turtles and pelagic longlines.



Some sea turtles you see at your fishing grounds roam over very broad areas. For instance, loggerhead sea turtles travel back and forth from their birthplace in Japan to their feeding grounds in Mexico, and from nesting beaches in Australia to the coast of South America. If you are already taking effective steps to minimize interactions with turtles, share your good ideas regionally so that all fleets that interact with these highly migratory animals know about the best practices.

The olive ridley turtle is one of the species caught in longline fisheries. Sea turtles like this one have been around over 200 million years – they were around at the same time as dinosaurs. Activities like egg collection on beaches and capture in fishing gear are now causing many turtle populations to crash.

Many sea turtle populations are declining sharply. In particular, leatherback and loggerhead sea turtles may disappear from the Pacific Ocean within the next two decades unless we reduce their mortality. Over the past 20 years, the number of nesting leatherback and loggerhead turtles in the Pacific has dropped by 95% and 80% respectively. The killing of sea turtles in pelagic longline gear, although only part of the whole problem, is a big concern.

There is a movement to close down pelagic longline fisheries, in part because of concerns about harming sea turtles. Some longline fleets have been banned from large areas and temporarily closed because of the capture of turtles. This may have a serious impact on the global longline industry. Longline fishermen are among the most qualified people to develop and improve methods to reduce sea turtle capture. Fishermen and longline boat-owner and exporter associations need to take part in finding solutions to the problem by actively participating in research and commercial demonstrations, employing best practices, supporting the adoption of effective regulations, and abiding by these regulations. Otherwise, the only alternatives left to management authorities may be more restrictions, embargos, and closures.

The aim is to find effective ways to minimize interactions with turtles while maintaining the viability of pelagic longline fisheries. The pelagic longline industry is in a good position to find practical ways to minimize turtle mortality:

- Unlike some other gear types, pelagic longlines do not touch the seafloor and damage habitat;
- Longlines are generally quite selective and can be rigged to reduce bycatch; and
- Techniques for longline vessels to minimize mortality of sea turtles and seabirds are being developed by fishermen and scientists, and employed in some fisheries.

Almost all species of sea turtles are in danger of extinction, but the loggerhead (left) and leatherback (right) turtles, which are caught in longline gear, are in much worse shape than the others.

Possible Solutions

It should be possible to reduce sea turtle capture and mortality in pelagic longline gear to negligible levels. In the last few years, researchers and fishermen have developed new techniques that significantly reduce turtle capture and injury and are acceptable to industry. Using large 18/0 circle hooks and setting gear below 40 m appear to be solutions for some fisheries. But these results are preliminary. More research and commercial demonstrations are needed, especially for fisheries where large hooks and deeper setting are not economically possible.

Please help find the best solutions, starting by contacting the organizations listed on the back cover for more information and to share your ideas.

Reduce capturing and injuring turtles – use a large circle hook

- The wider the hook, the less likely a turtle will be able to swallow it.
- Circle hooks may cause fewer hookings to the turtles' body than J and tuna hooks.
- Hard-shelled turtles are most often caught by ingesting a hook. Soft-shelled leatherback turtles tend to get entangled in gear. Circle hooks are more likely to hook hard-shelled turtles in the mouth, versus being hooked deeply as typically occurs with J hooks. If still alive when gear is retrieved, turtles released after being hooked in the mouth survive better than more deeply hooked turtles.

9/0 J hook (left) and 18/0 circle hook (right)

If possible, use a large circle hook, large bait, and set gear deep.

Reduce interactions with turtles – set gear deep

Set your gear as deep as possible to minimize interactions with turtles. Setting gear below 40 m (22 fathoms) is expected to reduce turtle captures. For starters, don't place branchlines near floats. To minimize the risk of entangling turtles, keep the amount of gear between 0-40 m to a minimum by increasing the length of buoy lines rather than having short buoy lines and longer branch lines.

Avoid problem areas

If interactions with turtles are a rare event at your fishing grounds and you catch a turtle, move to new grounds before making another set to reduce the chance of catching another turtle. And inform other vessels of the position of the turtle capture so they can avoid the area. Avoiding fishing in areas with high numbers of turtles, such as near turtle nesting beaches, will also help.

Fish versus squid bait, large versus small bait

If you have the option, using fish as bait instead of squid may help keep turtles off your hooks. Fish appears to come free of the hook while being progressively eaten by a turtle in small bites. Squid holds much more firmly to the hook and tends to cause more turtles to ingest the hook with the squid. Also, larger bait may be harder for turtles to swallow than smaller bait. Compare bait types to determine which one maintains catch rates of target fish and catches fewer turtles.

Using fish as bait instead of squid, when available, may help keep turtles off your hooks.

Circle hook commercial viability

In the U.S. Atlantic longline swordfish fishery, using 18/0 circle hooks with mackerel bait improved swordfish catch-per-unit-of-effort compared to fishing with conventional 25 degree offset 9/0 J hooks with squid bait. Use of large circle hooks may also be economically feasible in other longline fisheries, but this needs to be confirmed. While large J hooks are available in a wide price range, inexpensive large circle hooks are not available. As demand for a wider price range of large circle hooks increases, supply is likely to follow.

Research Directions

Researchers continue to develop effective, commercially viable, and practical methods to minimize turtle capture and injury in longline gear. Below is an overview of some of the research directions to address turtle capture in pelagic longline gear.

Take an active role to minimize the capture of turtles in longline fisheries.

Reduced detection of bait and gear

Researchers are conducting studies using turtles in captivity and on longline vessels to find methods to reduce turtles' ability to detect baited hooks. Some of these methods include dyeing bait blue, using gear with countershaded floats (blue on the bottom half, orange on the top half), dark gray lines, dulled hardware (painted to remove the metallic shine), lightsticks shaded on the upper half, and lightsticks with narrow-frequency (yellow electronic light-emitting diode lightsticks).

Deterrents

Scientists are testing methods to deter turtles from eating baited hooks. These methods include acoustic deterrents, use of a fiberglass shark model, and soaking bait in various substances.

Deeper setting

Researchers are studying designs to place all baited hooks below a target depth to reduce capture of turtles and other undesired species. The technique is also being assessed for its ability to enhance catch-per-unit-of-effort of target species.

Baited hook designs

Altered hook and bait designs may reduce turtle capture, injury, and death. Some ideas include:

- Threading bait on hooks to completely conceal the hook;
- Using artificial lures;
- Placing a device near or over the baited hook to physically protect the baited hook from turtles. "Weedless" hooks have a device that covers the point of the hook to avoid foul hooking turtles but moves away from the point when a fish bites the hook. "Whisker" hooks have added material to increase the dimension of a hook, such as by adding a ring to the hook below the barb where monofilament can be threaded through, to make the hook sufficiently thick to prevent turtles from being able to swallow it. "Smart" hooks have a device added to the hook that conceals the point of the hook when at a shallow depth or warm sea temperature that moves away from the point of the hook when at depth or in colder water. One way to achieve this is by attaching a bimetallic strip to the hook on a hinge.

Peak turtle areas

Identifying peak areas and periods of turtle foraging and nesting enables the design of effective area and seasonal fishing closures. Closed areas can have adverse economic effects on industry, but remain an option for fishery managers if other acceptable alternatives are not available. Closed areas may also be more desirable than a closed fishery.

Reduced injury

Researchers continue to improve methods to handle, resuscitate, and release hooked and entangled turtles.

Releasing Captured Turtles

If you catch a turtle, you can increase its chance for survival by employing the following steps. Most turtles caught on shallow-set longlines are alive when hauled aboard, and if handled properly, they can be successfully released.

These guidelines are designed to be broad enough to apply to small-scale artisanal fisheries, small domestic commercial fleets, as well as modern, mechanized, distant-water fleets. Check with your fishery management authority to see if sea turtle handling guidelines designed specifically for your fishery are available.

1. If the turtle is too large to bring onboard, bring the boat as close to the turtle as possible. Avoid putting too much strain on the line.

   If the turtle is hooked and you can see the barb, use a long-handled dehooker to remove the hook. Otherwise, cut the line as close to the turtle as possible. Remove any line entangling the turtle. Wait for the turtle to move clear of the vessel before motoring away.

2. If the turtle is small and can be handled safely, use a dip net to bring it onboard. Do not use a gaff, pull on the line, or grasp the eye sockets.

An old tire makes a convenient holding platform and helps immobilize the turtle while removing gear.

3. Remove entangled fishing gear. If the turtle is hooked externally, such as on a flipper or in the beak, use bolt cutters to remove the hook.

4. If the hook is in the mouth or has been swallowed, place a gag, such as a wooden handle or rope, in its mouth so it cannot bite.

   If the turtle is lightly hooked in the mouth or beak and the barb is visible, use bolt cutters or a short-handled dehooker to remove the hook. If the turtle is hooked internally in the esophagus and the barb is visible, use a "bite block" dehooker if you have one.

   If the turtle is deeply hooked and you can't see the barb, remove as much of the line as possible without pulling too hard on the line.

5. After removing the fishing gear, if your vessel has a safe, shaded, cool location, keep the turtle onboard a minimum of 4 hours to allow stress toxins to dissipate. Cover the turtle's body with a wet towel, but do not cover the nostrils. Occasionally spray the turtle with water, avoiding the turtle's face so water does not go into the mouth or nostrils. After 4 hours, check if the turtle responds to a gentle touch of the eye or gentle pull on the tail. If it appears vigorous and strong, after fishing gear has been removed from the water, release it head first into the water, first stopping the vessel with the engine out of gear. Wait for the turtle to move clear of the vessel before motoring away.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6. If the turtle is lethargic and weak or unconscious, keep it onboard until signs of strength return, such responding to gentle touching of the eye and pulling of the tail. If the turtle is sluggish and inactive when brought onboard, it may have water in its lungs. In this case, raise the rear flippers about 20 cm while it recovers. While it recovers, place the turtle in a safe, shaded, cool location and keep it moist as previously described.


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7. As soon as the turtle regains its strength and has rested, release it. Even if the turtle fails to regain consciousness or strength after 24 hours, release it carefully as it may still recover.

8. Record the turtle capture in your logbook, identify the turtle species, and record any tag numbers. If the turtle was hooked, record the location where it was hooked, and record the location where the turtle was captured and released, including the state the turtle was in when released.

Credits

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