Reduction of sea turtle mortality in the professional fishing

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Alessandro Lucchetti
CNR-ISMAR
a.lucchetti@ismar.cnr.it
0039 071 2078828
Reduction of sea turtle mortality in the professional fishing
The project TARTALIFE, involving all 15 Italian regions overlooking the Mediterranean Sea, aims at reducing the mortality of *Caretta caretta* and thus contributing to the conservation of the species in the Mediterranean, via 2 main objectives:

- Reducing bycatches caused by pelagic longline, bottom trawl and fixed nets disseminating circle hooks and TEDs and testing UV and a new type of collapsible pot

- Reducing post-capture mortality, training fishermen and strengthening the Marine turtles First Aid/Rescue Centres
Methodological approach

- Knowledge

  Identify problems and hotspots

- Define proper actions and tools
Knowledge

Define the baseline

- Review of the available information (biology, migration etc.)
- Bycatch and mortality by fishing gear and area
- Technical properties of fisheries and fishing gears
- Review of the possible actions and solutions
Knowledge

Define the baseline:
Biology: satellite, bycatch, stranding...
The impact of fishing activities is considered as the most important anthropogenic mortality factor for marine turtle populations in the Mediterranean Sea.

In the Mediterranean, surface longline, driftnet and bottom trawl nets operating in the Mediterranean are the major threats to the survival of this species, even if the impact of fixed gears (gillnets and trammel nets) should be carefully considered.

Identify technical properties of fishing gears leading to turtle bycatch.
Recent estimates report that fishing activities are responsible for the incidental catch of about 130,000 marine turtles every year in the Mediterranean, caused by longline (70,000), bottom trawl (40,000) and fixed net (ca. 23,000), with over 40,000 estimated deaths; official data do not include all existing boats and underestimate the number of small boats, mainly from North Africa countries: therefore, a more realistic number can be set at 200,000 catches and 70,000 deaths.
Knowledge

Hotspot?

Area Gear Period

Lucchetti et al., 2015
Ecological Indicators
Knowledge

Hotspot bycatch by area, gear and period: gears, areas and periods selected for sea trials

Bottom trawls  Longlines  Passive nets

Focus the study where and when there is a bycatch problem
Knowledge

Main problems

- To define the baseline (bycatch, by area, gear, period): database availability, satellite data etc.

- To identify proper measures of mitigation: which measures are more suitable

- Public perception of fishers and bycatch
Until now: fishermen responsible for the catch of turtles

TartaLife: Fishermen main actors of the project with the aim of reducing sea turtle bycatch. Give responsibility to fishermen
Concrete actions

C1: Dissemination of circular hooks in pelagic longline fishing
Good efficiency in reducing bycatch of turtles and throat hooking 18 longlines (1100 hooks each)

Circle Hook size: 15/0 inox
J hook size: n. 2
Branchline length: 9 m
Distance between branchlines: 35 m

Test solutions that everybody agrees with rather than solutions that everybody dislikes or perceives as a top-down imposition.
C2: Update and dissemination of Turtles Excluder Devices (TEDs) in bottom trawl fishing

TED is a grid-like device that diverts large objects (including turtles) towards an exit positioned before the codend.
Concrete actions

TED: Technical issues

Exit hole: up or down

Type: Hard or flexible

Space between bars

Setting of the grid: angle
Concrete actions

TED: Technical issues

Funnel or not funnel?
Flapper or not flapper?

Influence of TED on the gear performance
Concrete actions

TED: Preliminary results

- No commercial loss
- Effective in reducing marine litter and debris (higher fish quality)
- Effective in reducing sea turtle bycatch
Concrete actions

TED: Preliminary results

Effective in reducing sea turtle bycatch

TartaLife

Bottom exit
Concrete actions
TED: Preliminary results
Effective in reducing marine litter and debris in the catch
Concrete actions

TED: Preliminary results

Effective in reducing marine litter and debris in the catch
Concrete actions

TED: Preliminary results

Effective in reducing marine litter and debris in the catch
C3: Reduction of incidental catch of sea turtles in the passive nets: setup and dissemination of visual repellents and alternative gears

**VISUAL REPELLENTS**

The UV-LEDs tested in TARTALIFE are special electronic lights. Similar lights are generally used in longline fisheries. We illuminated the commercial bottom-set gill net by placing UV LED lights (*Lindgren-Pittman Electralumes*) at 15 m intervals along the net’s float line.

**ALTERNATIVE GEARS**

Fishing with passive nets is the most popular traditional fisheries along the Italian and the Mediterranean coasts. It is the predominant activity of small-scale fisheries. In this regard, the decision to propose an alternative gear to passive nets has fallen on another type of traditional gear: the pot.
Visual cues play important roles in sea turtle foraging behaviour and likely influence their interactions with fishing gear. Altering these cues may be a useful strategy to reduce the incidental catch of sea turtles in various fisheries (Wang et al. 2010).

First idea in the project:
Acoustic deterrents

Visual deterrents

Sea turtles are sensitive to ultraviolet (UV) wavelengths. **UV net illumination** may have applications in coastal and pelagic gillnet fisheries to reduce sea turtle bycatch (Wang et al. 2013).
Visual repellents

TartaLife

[Images of coastal areas and sea life]
PRELIMINARY RESULTS:
(a) Testing net illumination effects on turtle catch rates

Target species: 
*Raja clavata*

*In the presence of LEDs no individual of sea turtle has been caught*
PRELIMINARY RESULTS:
(b) Testing net illumination effects on total target fish

In the presence of UV-LEDs it has been a decrease in the quantities of catches of some of the most important target species (R. clavata, R. asterias). Other species are not affected. More tests are needed (on different ‘metier’), to assess the UV-LEDs real effect on fishing performance.
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New collapsible fish pots already used in other European areas has been tested and adapted to Mediterranean fishing grounds.
Alternative gears

PRELIMINARY RESULTS:

- CARAPAX pot seem to be not easy to handle on board of fishing vessels with small dimensions, but, theoretically, it can provide bigger catches in consideration of their dimensions.
- TRAPULA pot are easy to handle and it allows to fish on various types of seabed.

Fish pot performance is affected by different factors as:
- the choice of bait
- the fishing grounds
- the target species
Concrete actions

Awareness campaigns

C4: training of fishermen on how to rescue and deliver first aid to accidentally caught turtles
Concrete actions

Awareness campaigns

C4: training of fishermen on how to rescue and deliver first aid to accidentally caught turtles

Video Tutorial

COME SALVARE UNA TARTARUGA MARINA

- Allerta la Capitaneria di Porto e il Centro di Recupero Tartarughe Marine più vicino.
- Liberalà da reti e lenze con cura, facendo attenzione alla bocca e alle unghie.
- Afferrala solo dalle estremità del carapace.
- Se ha abbocato all‘amo, issala a bordo utilizzando il retino. Taglia la lenza più vicino possibile alla bocca e legala ad un pezzo di legno o plastica in modo che non la ingoii.
- Se è stata pescata nelle reti, stendila a pancia in giù in un luogo tranquillo su una superficie morbida, sollevando il posteriore di 20-30 cm per far defluire dal polmone eventuale acqua ingerita.
- In estate tienila all‘ombra e copriila con un asciugamano bagnato sul carapace.
- Copri la testa e gli occhi, ma mai le narici.
- In inverno tienila in un luogo caldo e asciutto e copriila con una coperta.
- Copri la testa e gli occhi, ma mai le narici.
- Prendi nota del luogo e dell‘ora del recupero.
- Consegna alla Capitaneria di Porto o Centro di Recupero e riportali le modalità ed il luogo del ritrovamento.
Concrete actions

Awareness campaigns

C4: training of fishermen on how to rescue and deliver first aid to accidentally caught turtles
Concrete actions

TED: Preliminary results

C5: strengthening Marine Turtles Rescue Centres (equipment and re-training of staff), setting up a Centre in Lampedusa and first aid points on Emilia Romagna and Marche coasts
Communication and dissemination
Future challenge

How to involve fishermen??

Voluntary?

Mandatory use of Bycatch Reducer Devices (BRDs)?

Economic support for the BRDs purchase?

Eco-labeling of fishery products caught with BRDs?

Recovering licence points, if a point system for serious infringements is applied?
Thank you