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Reduction of sea turtle mortality in the professional fishing

WORKSHOP:
Best practice per la gestione delle risorse idriche e la tutela dell'ambiente marino: Il contributo dei progetti LIFE

20 ottobre 2015
padiglione expo Venezia,
sala conferenze
via Galileo Ferraris, 5
Venezia

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Progetto di

Con il contributo di

Partner

Cofinanziatori

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Reduction of sea turtle mortality in the professional fishing

NATURA 2000

Progetto di

Con il contributo di

LEGAMBIENTE

REGIONE MARCHE

Project goals

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

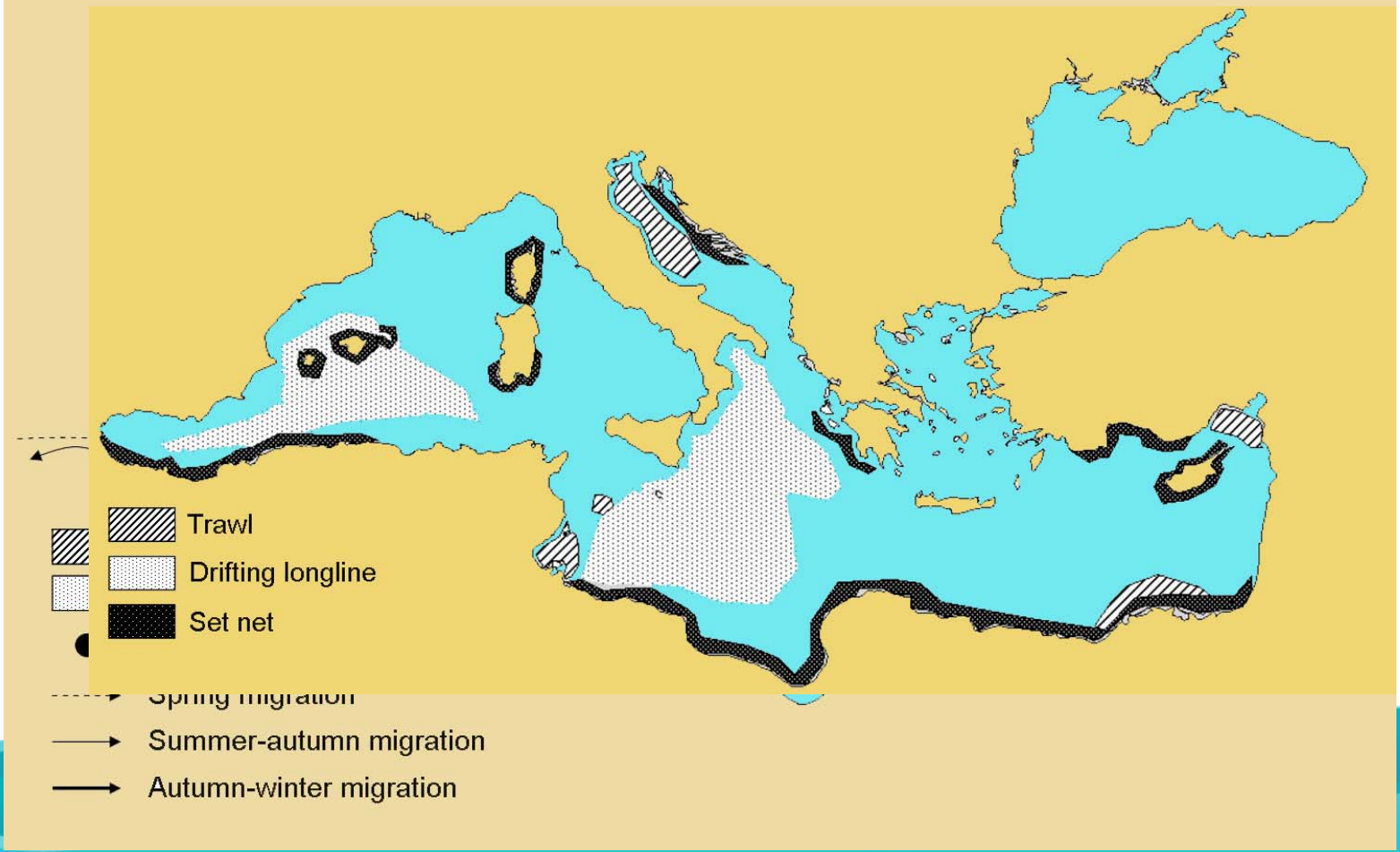
- Define proper actions and tools

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

Define the baseline:

Biology: satellite, bycatch, stranding ..

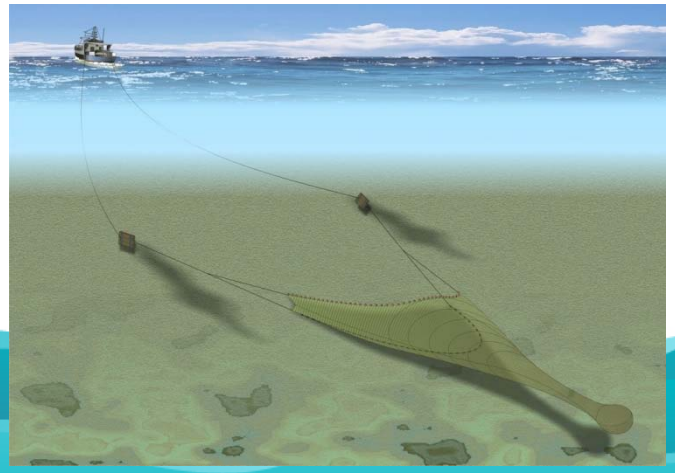


Define the baseline:

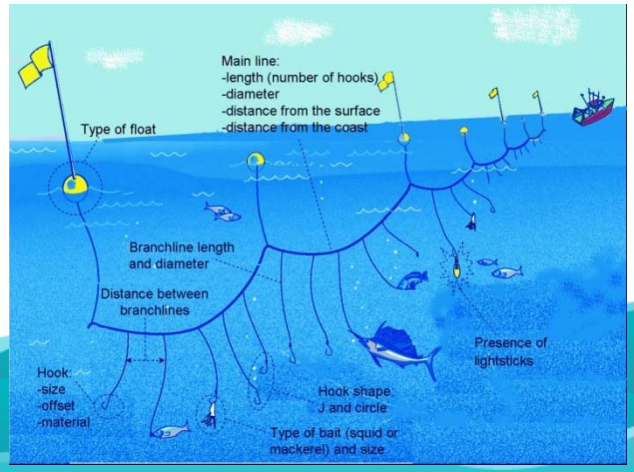
Fishing gears, Tech. Properties, Bycatch

- 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

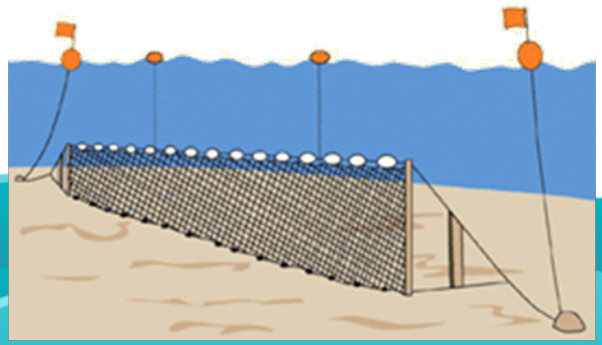
Bottom trawl



Longline



Passive nets



Knowledge

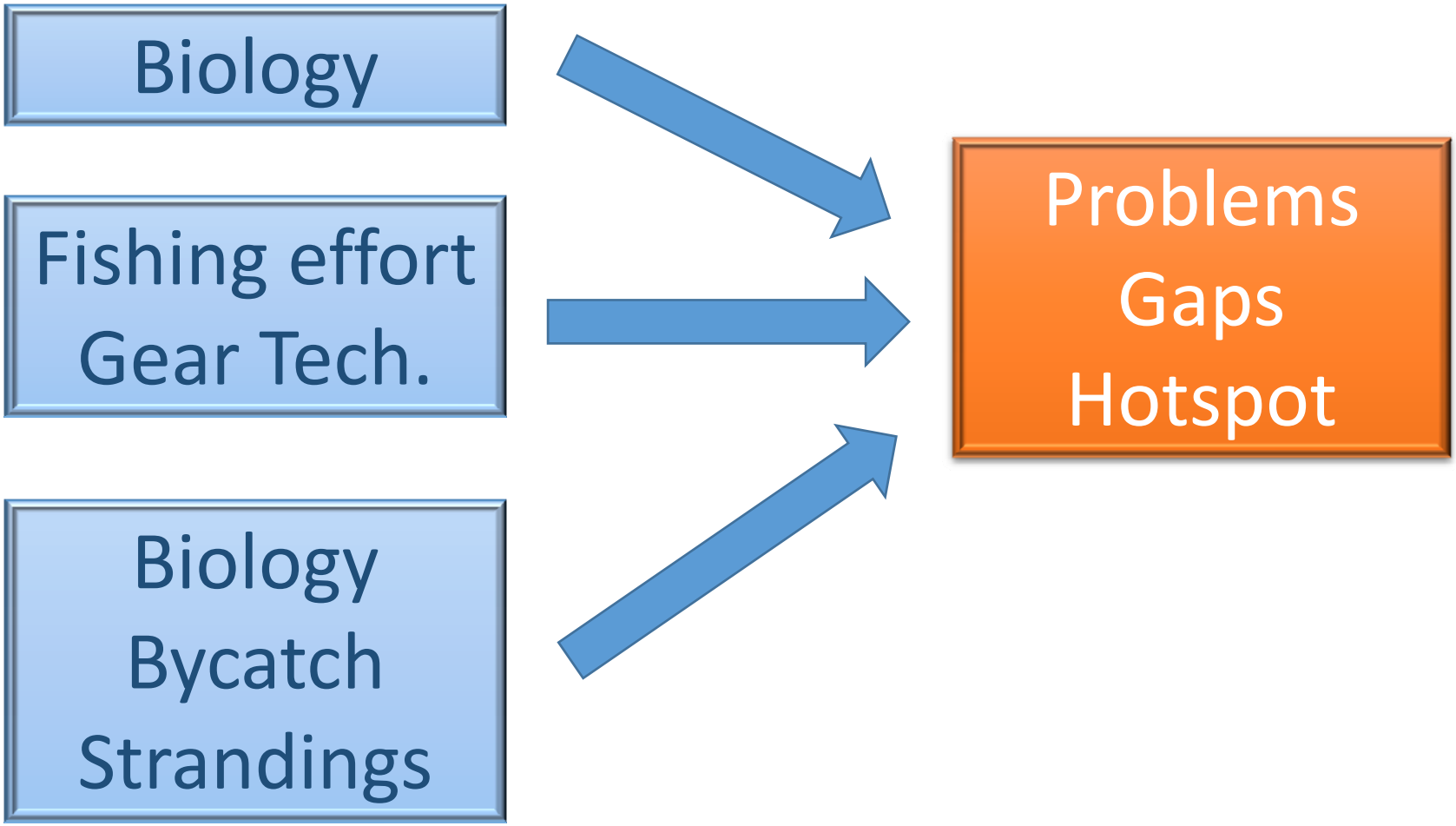
Recent estimates report that fishing activities are responsible to the incidental catch of about 130000 marine turtles every year in the Mediterranean, caused by longline (70000), bottom trawl (40000) and fixed net (ca.23000), with over 40000 estimated deaths; official data do not include all existing boats and underestimate the number of small boats, mainly from North Africa countries: therefore, a more realistic number can be set at 200000 catches and 70000 deaths.

Bottom trawl

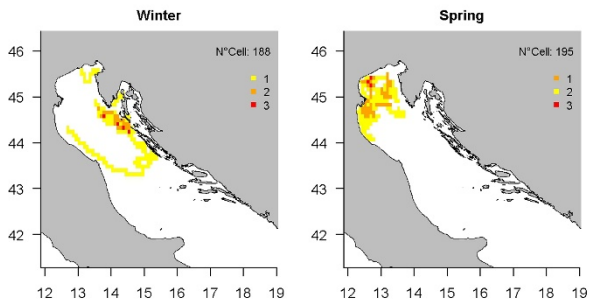
Longline

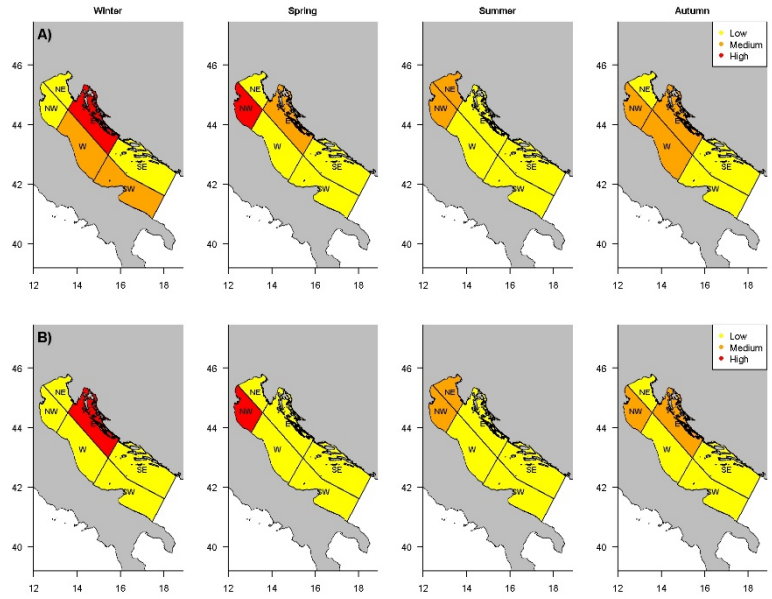
Passive nets

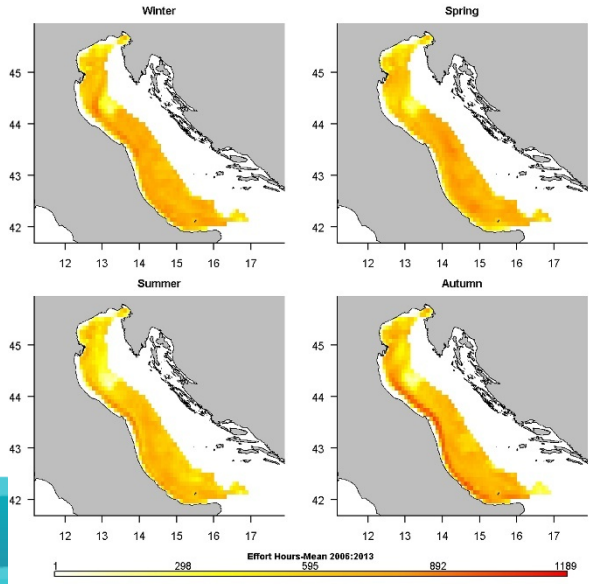
Knowledge

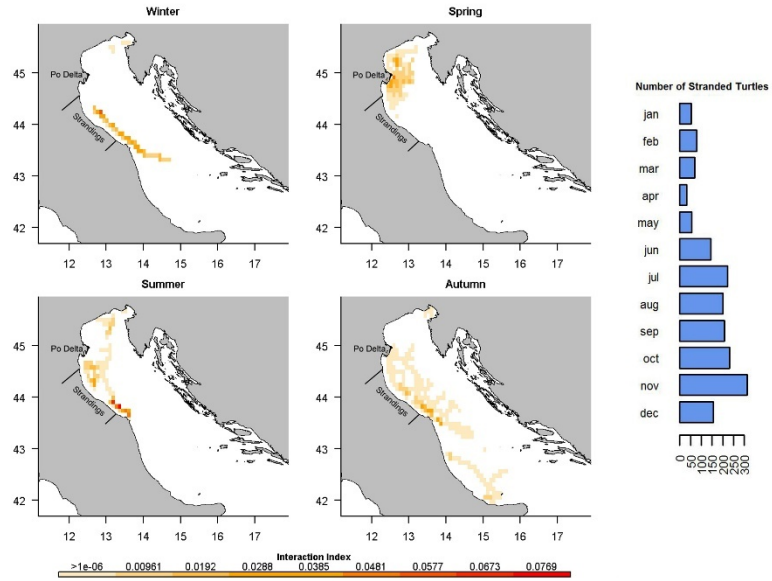

Biology
Fishing effort
Gear Tech.
Biology
Bycatch
Strandings
Problems
Gaps
Hotspot

Knowledge









Hotspot?

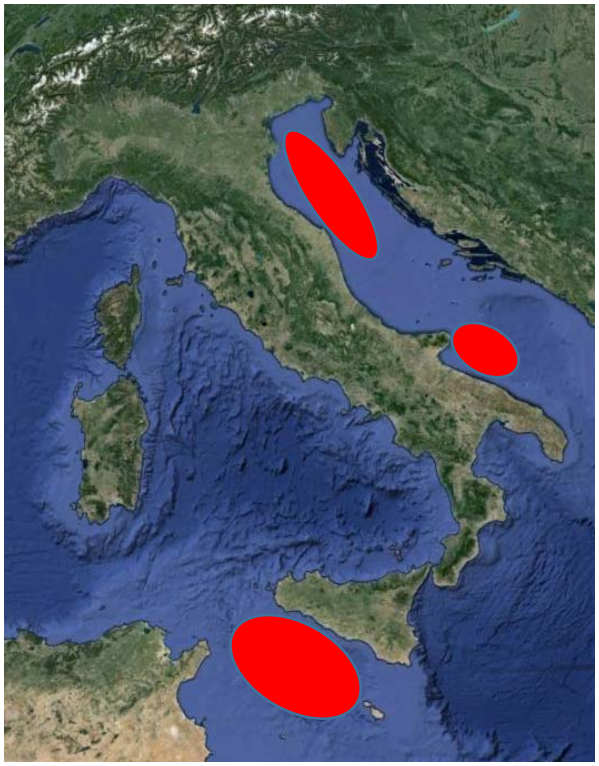
Area
Gear
Period

Lucchetti et al., 2015
Ecological Indicators

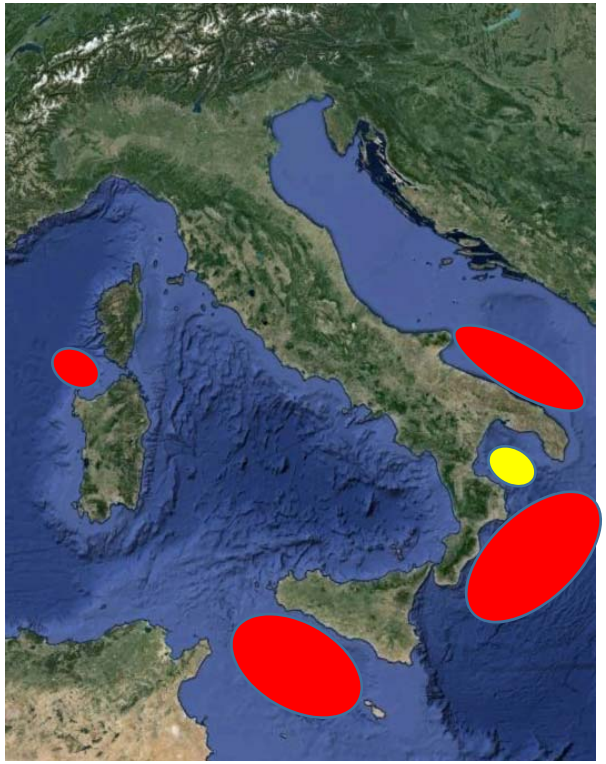
Knowledge

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

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

Communication

Progetto di

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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

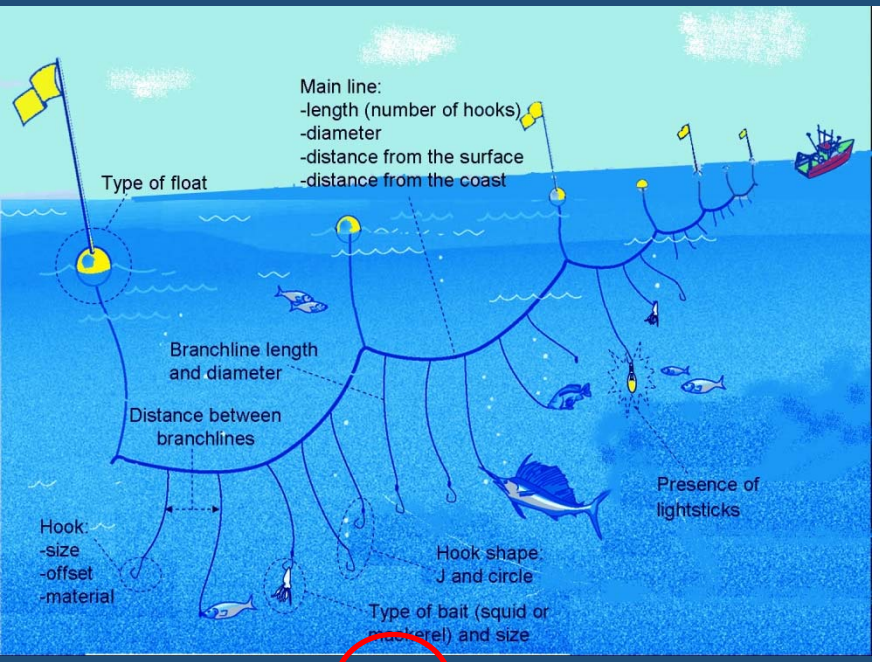
C1: Dissemination of circular hooks in pelagic longline fishing

Concrete actions

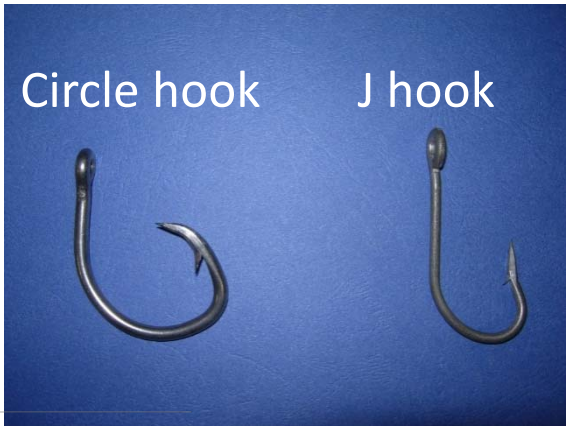
Progetto di ISMAR

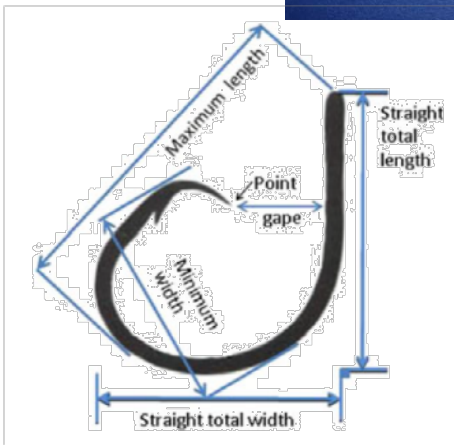
Con il contributo di Life12 NAT/IT/957 NATURA 2000

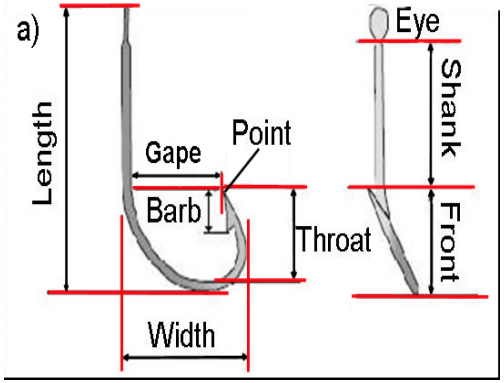
Good efficiency in reducing bycatch of turtles and throat hooking
18 longlines (1100 hooks each)



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





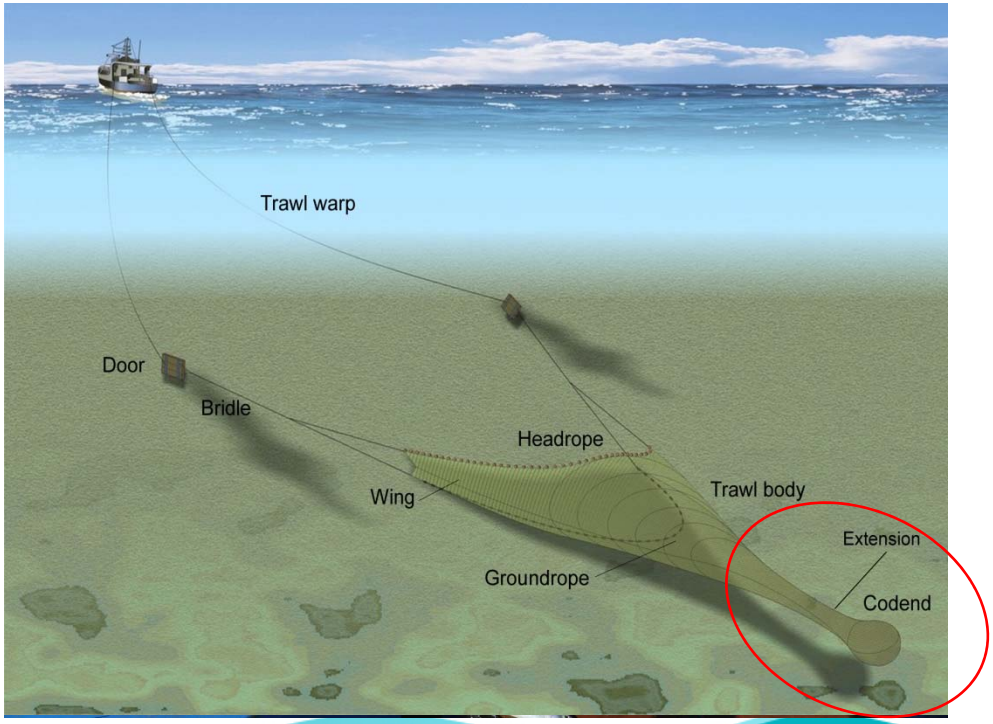


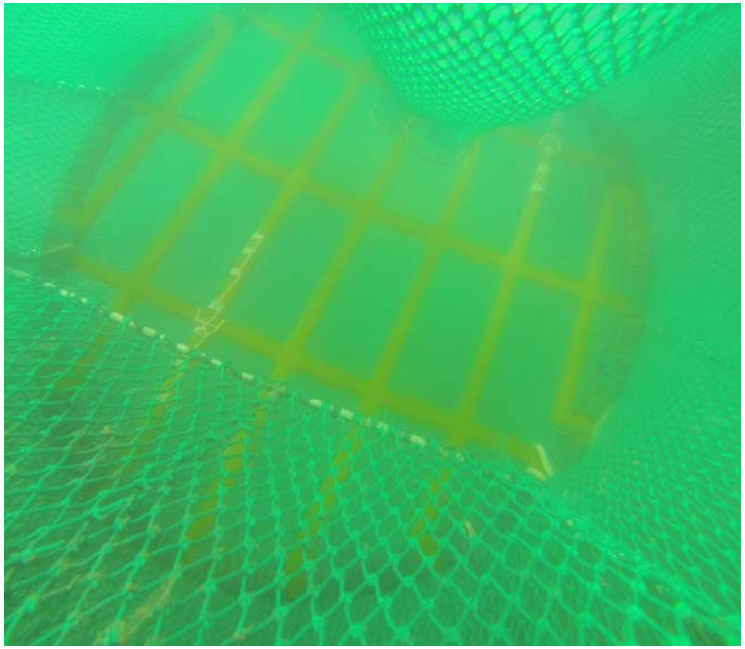
Test solutions that everybody agreeds with rather than solutions that everybody dislikes or perceives as a top-down imposition.

Concrete actions

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

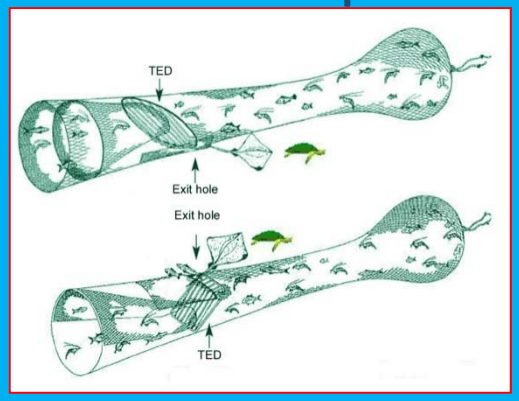




Concrete actions

TED: Techincial issues

Exit hole: up or down



Type: Hard or flexible

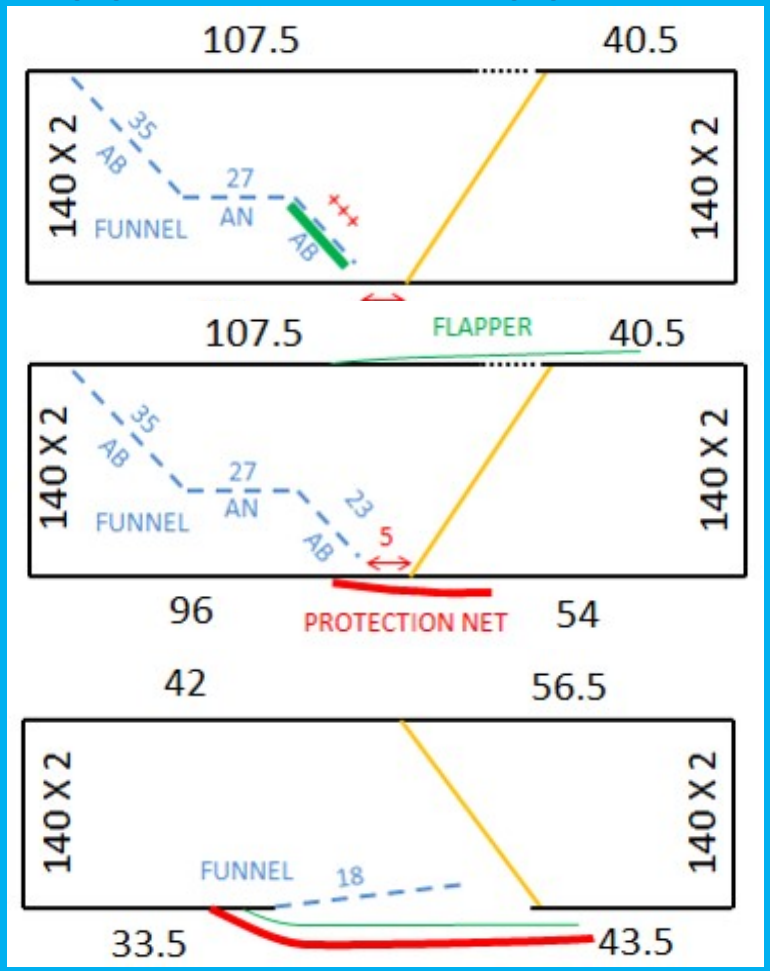
Space between bars

Setting of the grid: angle

Concrete actions

TED: Techincial issues

Funnel or not funnel?
Flapper or not flapper?



Influence of TED on the gear performance

Concrete actions

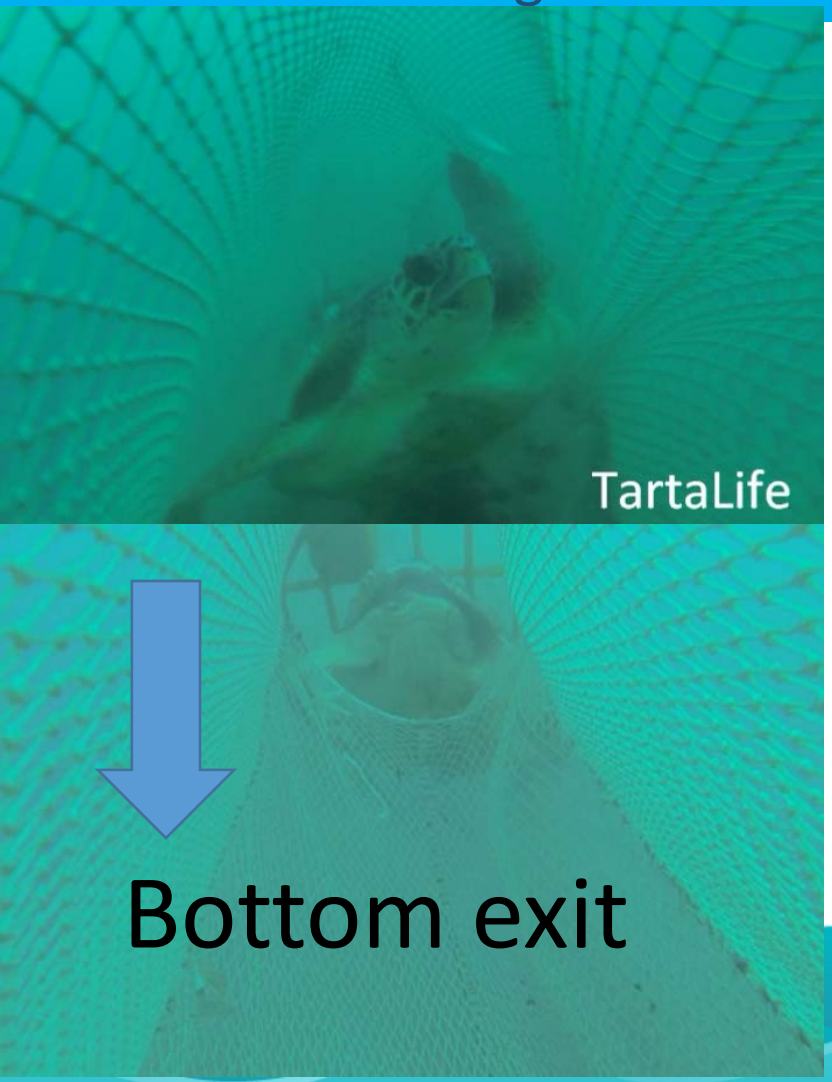
TED: Preliminary results

- 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



Concrete actions

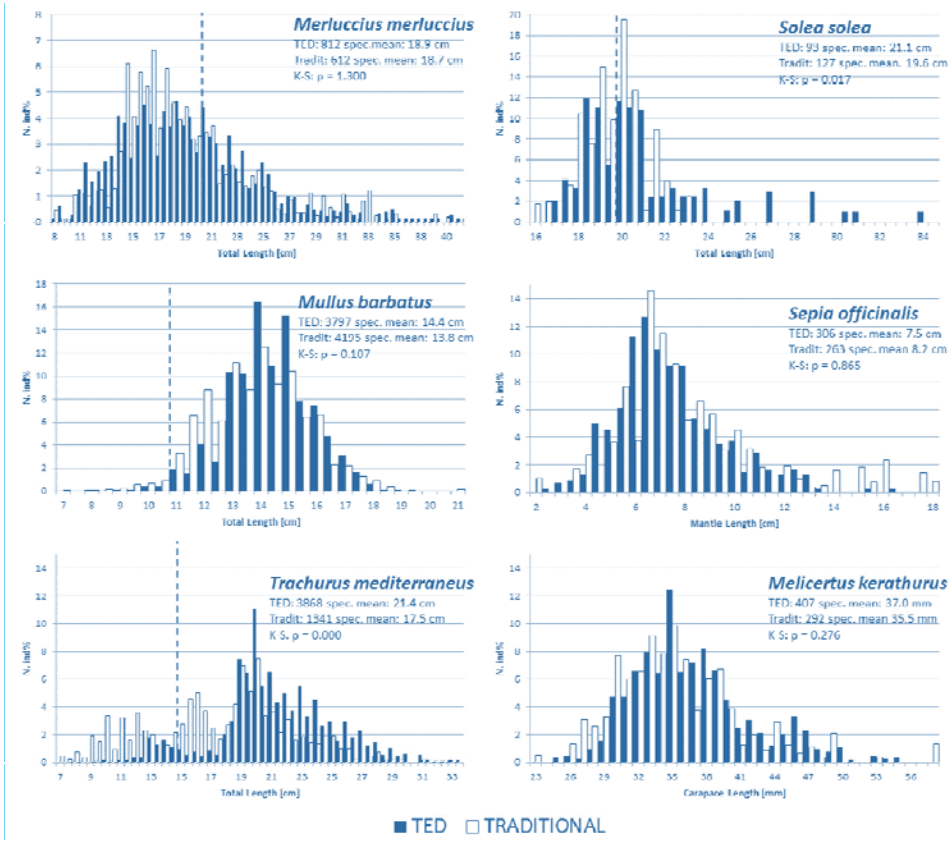
TED: Preliminary results

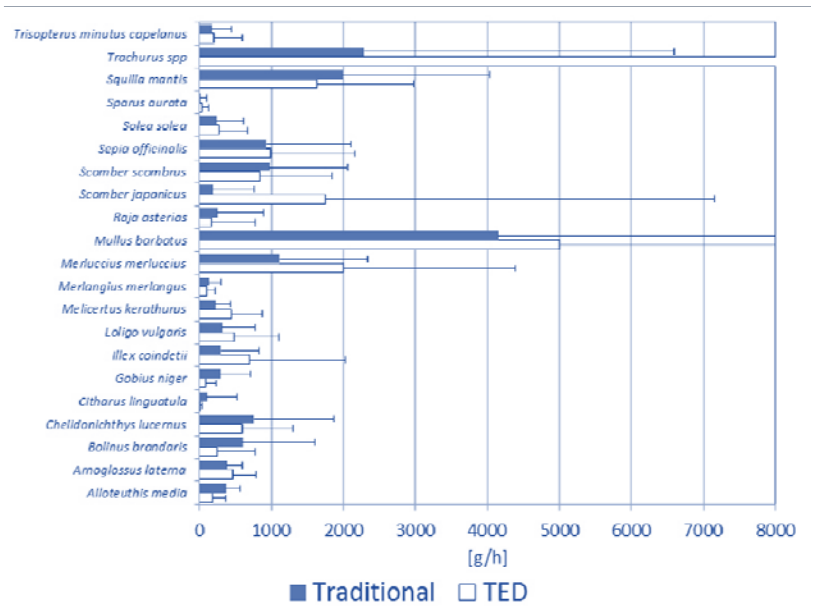
Effective in reducing marine litter and debris in the catch

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

Concrete actions

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 repellents

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

Vol. 408: 241–250, 2010
doi: 10.3354/meps08577

MARINE ECOLOGY PROGRESS SERIES
Mar Ecol Prog Ser

Published June 3

Developing visual deterrents to reduce sea turtle bycatch in gill net fisheries

John H. Wang[1,*], Shara Fisler[2], Yonat Swimmer[3]

biology letters

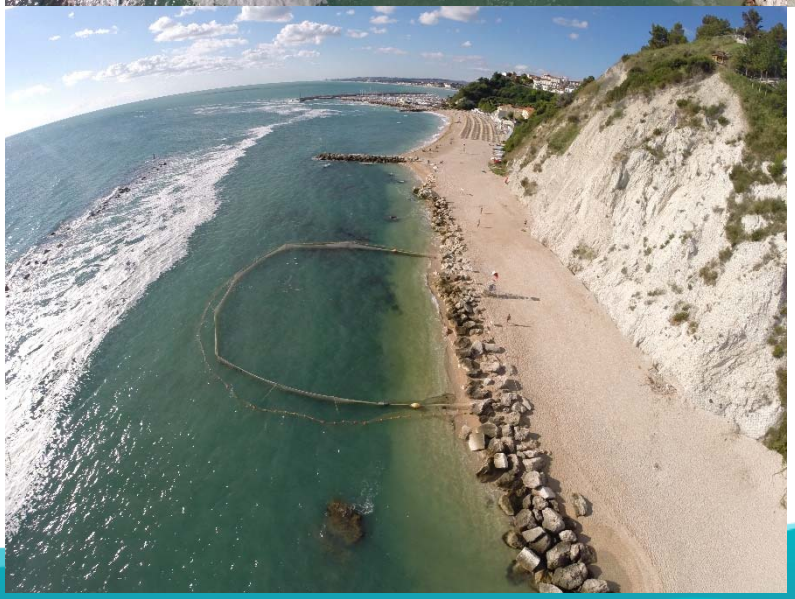
Developing ultraviolet illumination of gillnets as a method to reduce sea turtle bycatch

John Wang, Joel Barkan, Shara Fisler, Carlos Godinez-Reyes and Yonat Swimmer

Biol. Lett. 2013 **9**, 20130383, published 24 July 2013

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).

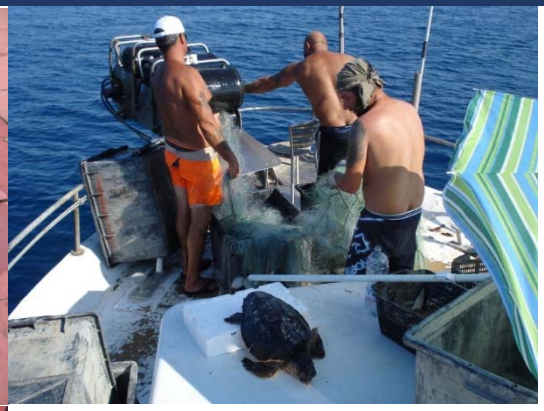
Visual repellents



Visual repellents

PRELIMINARY RESULTS:
(a) Testing net illumination effects on turtle catch rates



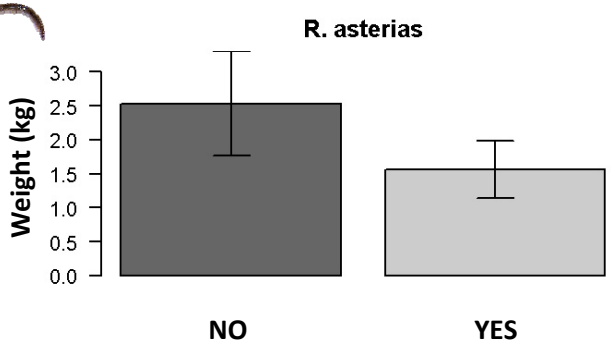


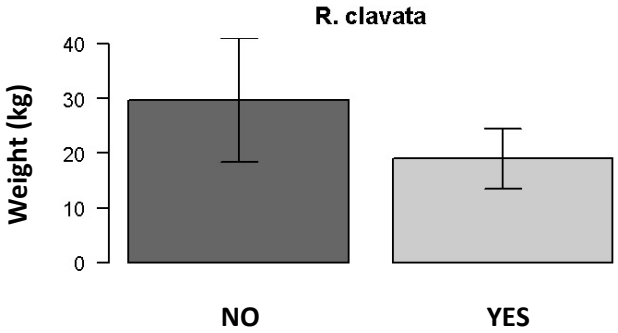
Tartget species:
Raja clavata

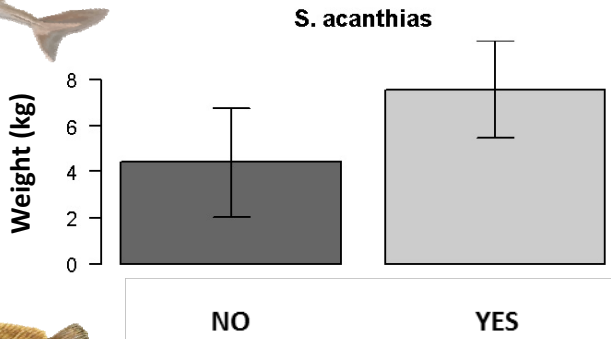
In the presence of LEDs no individual of sea turtle has been caught

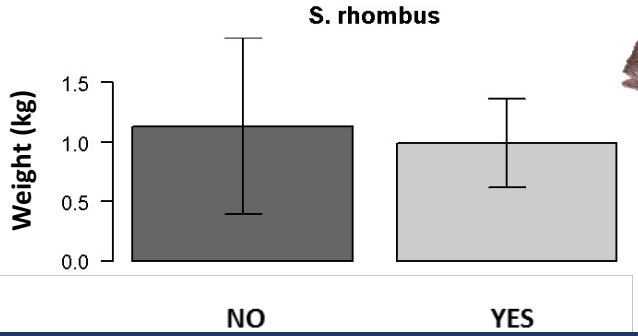
Visual repellents

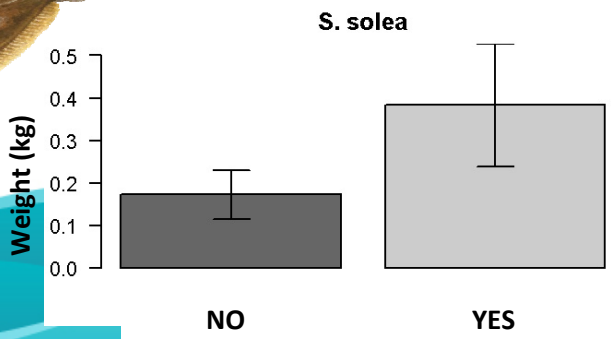
PRELIMINARY RESULTS:
(b) Testing net illumination effects on total target fish











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.

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**.

CARAPAX

TRAPULA

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

CARAPAX

Fish pot performance is affected by different factors as:

- the choice of bait
- the fishing grounds
- the target species

TRAPULA

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

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

Progetto di ISMAR

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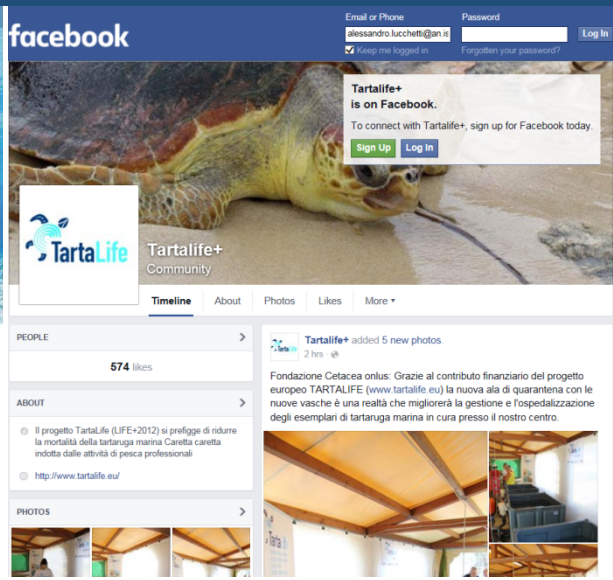

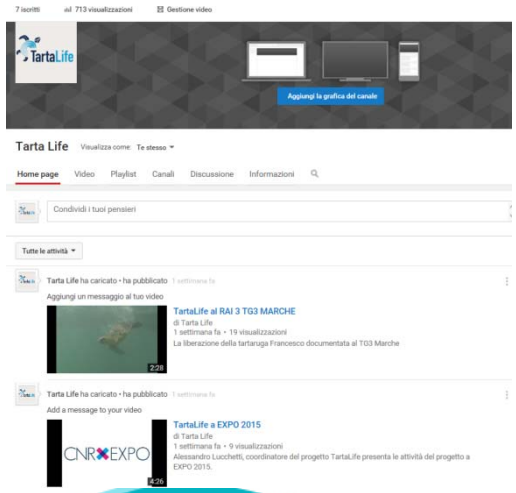

Future challenge

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?

TartaLife

Thank you