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REDUCTION OF LOGGERHEAD TURTLE (*CARETTA CARETTA*) BYCATCH IN MEDITERRANEAN BOTTOM TRAWL FISHERIES

*RIDUZIONE DEL BYCATCH DI TARTARUGHE MARINE (*CARETTA CARETTA*) NELLA PESCA A STRASCICO MEDITERRANEA*

Abstract - *We investigated the effect of TED design on loggerhead turtle (*Caretta caretta*) bycatch of bottom trawl fisheries, frequently captured in the Adriatic fisheries. For each TED types, bycatch and debris reduction as well as commercial species losses were evaluated. The last two TED designs demonstrated to reduce debris and therefore fish quality. This also would imply reduction of additional sorting operations on board, increasing time and costs. We believe that TEDs can be properly proposed as management tool for the conservation of marine turtle population in the Italian Seas.*

Key-words: *Turtle Excluder Device, Mediterranean trawl fisheries,* Caretta caretta*, sea turtle, bycatch.*

Introduction – Fishing-induced mortality is considered a major threat to sea turtle populations worldwide (Tudela, 2000). The Barcelona Convention adopted an Action Plan for the Conservation of Mediterranean Marine Turtles in 1989, acknowledging that trawl catches are the most serious threat to the sea turtles. It is estimated that more than 60000 turtles are incidentally caught annually as a result of the fishing practices (Tudela, 2000). Traditionally surface longline targeting swordfish, bluefin tuna and albacore is considered as the main responsible for loggerhead turtle (*Caretta caretta*) bycatch, mainly in the western and central Mediterranean Sea (Camiñas and de la Serna, 1995). Nevertheless, in the last years a growing number of sea turtles are accidentally caught by bottom trawlers in the Adriatic Sea and in the Gulf of Gabés in Tunisia. Casale *et al.* (2004) estimated that in the Adriatic Sea more than 4000 turtles per year are caught. This area is considered for its shallow waters (<100 m) and rich benthic communities as of the most important foraging areas in the whole Mediterranean for the adults and juveniles loggerheads during their demersal life phase. Few unofficial observations report that most of the incidental catches occur in late winter and spring. When captured by a trawl net, turtles may drown, becoming first comatose and eventually dying. One of the most important management measures to protect sea turtle, especially of the juveniles and subadult size class, is the use of Turtle Excluder Devices (TEDs). TEDs are actually widely employed in several areas of the World but no experiences are available for Italian waters. There are a variety of hard TED designs but generally it is very difficult to introduce new technical solutions if the economic losses are considerable.

Materials and methods – The current study has been carried out with financial support from the Commission of the European Communities, Project Life-Natura *"Tartanet"*. We projected and tested at sea five different types of low-cost TEDs. The first type of TED (TED1) was an oval rigid grid made of aluminium with removable bars. TED1 was developed with removable and adjustable bars. The second type was a semi-rigid grid (TED2), which was made of mixed cable (steel and polyethylene). The third type (TED3) was made of steel and rubber with the main characteristic to be flexible and resistant. TED3 has a single external hoop used to strength the TED

frame and to maintain the TED at a determinate angle. The hoop and the deflector grid were sewn to the trawl extension in order to "fix" the angle of the TED in the trawl. The angle at which the TED operates during tow (usually between 30-55° with the towing direction) is an important factor in preventing fish loss. The fourth type (TED4) was a typical Super-Shooter grid made of aluminium. Three fishing trips were performed between April 2007 and March 2008 in order to assess the efficacy of the different TED types.

Results – TED1 gave the worst results because it was very weak and the catch of big amount of debris (mainly stones) caused the breaking of the grid. TED2 was effective in reducing the Debris but it was not satisfying because the grid allowed the escape of many commercial species, therefore not enforceable for commercial fishing. TED3 was more efficient because allowed to avoid the catch of big quantity of debris (plastic materials, wood, stones etc). This greatly affected the fish quality of the catch in respect to the traditional codend catch. Moreover the losses of commercial species were negligible. Finally TED3 proved to be efficient in avoiding the catch of sea turtle. A simulation with a small container 40×40 cm was done and a carapace of a died turtle were ejected from the trawl. Finally a Super-Shooter TED was tested, it resulted efficient in reducing the debris in most of the hauls but it was very difficult to set the correct angle of the grid into the net.

Conclusions – Some authors (Casale *et al*., 2004; Laurent *et al*., 1996) believe that *"…the TEDs available at present are probably not a realistic solution for reducing turtle bycatch in the Mediterranean, because they are designed for the shrimp trawl fishery and they would exclude the larger commercial specimens too…"*. Nevertheless the foregoing, commercial fishermen are very keen in testing this solution. In fact TEDs demonstrated to reduce debris and therefore fish quality. This also would imply reduction of additional sorting operations on board, increasing time and costs. We believe that TEDs can be properly proposed as management tool for the conservation of marine turtle population in the Italian Seas.

References

CAMIÑAS J.A., DE LA SERNA J.M. (1995) - The loggerhead distribution in the western Mediterranean Sea as deduced from captures by the Spanish long line fishery. *Scientia Herpetologica,* **1995**: 316-323.

CASALE P., LAURENT L., DEMETRIO G. (2004) - Incidental capture of marine turtles by the Italian trawl fishery in the north Adriatic Sea. *Biol. Conserv.,* **119**: 287–295.

LAURENT L., ABD EL-MAWLA E.M., BRADAI M.N., DEMIRAYAK F., ORUC A. (1996) - Reducing sea turtle mortality induced by Mediterranean fisheries: trawling activity in Egypt, Tunisia and Turkey. Report for the WWF International Mediterranean Programme. WWF Project 9E0103: 32 pp.

TUDELA S. (2000) - Ecosystem effects of fishing in the Mediterranean: an analysis of the major threats of fishing gear and practices to biodiversity and marine habitats. FAO Project for the preparation of a Strategic Action Plan for the conservation of biological biodiversity in the Mediterranean region: 45 pp.