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OBSERVATIONS ON DOLPHIN SIGHTINGS AT THE ROMANIAN COAST AND MEASURES TO REDUCE ACCIDENTAL CATCHES IN FISHING NETS

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ABSTRACT

Within the project “Improving the Conservation Status of Marine Biodiversity in the Romanian Coastal Zone, Particularly Dolphins”, which is carried out in the site ROSCI0066 Danube Delta - the marine area, data were collected on the presence of cetaceans in Romanian coastal waters or stranded on shore, during 2010 and 2011. As a solution to the major problem that dolphins face in the Black Sea, namely accidental tangling in fishing nets (most often fatal), the cetaceans are tried to be removed by modern technological methods, namely the location of acoustic dolphin warning devices on fishing nets (ADDs/PINGERS). The study is an overview of the results obtained so far, as well as the usefulness of the acoustic warning devices.

KEY WORDS: Black Sea cetaceans, ROSCI0066 Danube Delta site, ADD/PINGER, strandings, accidental catches.

AIMS

Annually, at Romanian Black Sea coast, as in other parts of the World Ocean, are recorded catches of dolphins and therefore induced mortalities, in particular to *Phocoena phocoena relicta*, judged to be more vulnerable to fishing practiced with nets for turbot, sturgeon and dogfish^{1,2}.

As there is already known, the abundances of the three species have known a dramatic decline in the 20th century, due to the direct killing practiced in old times, incidental catching in fishing gears, exhaustion of the fish populations entering the cetacean food and habitat degradation³.

In order to monitor the deaths of dolphins in the Romanian Black Sea, NGO “Mare Nostrum“ has organized a series of expeditions by sea and land, both individually and in cooperation with the National Institute for Research and Development “Grigore Antipa“ Constanța (INCDM) Border Police Inspectorate of Constanța County (Border Police),



Agency for Fisheries and Aquaculture, Constanța Branch (NAFA), Danube Delta Biosphere Reserve Tulcea (DDBRA), Dolphinarium Constanța, institutions that are also partners in the project “Improving the Conservation Status of Marine Biodiversity in the Romanian Coastal Zone, Particularly Dolphins”, project funded by Sectorial Operational Program Environmental priority axis 4.

In order to solve the by-catching problem, researches conducted to date have identified a range of ultrasound devices that have a strong removal effect of cetaceans. Pingers are actually micro-computers, with recent usage and the researchers until now, with these devices, worldwide, have shown that they are very effective in reducing by-catches in fishing gears⁴. The second objective was to assess the applicability and results for using these devices on the Black Sea cetaceans.

BACKGROUND:

The Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS), entered into force on June 1, 2001, opened a new era of research on Black Sea cetaceans, to establish their situation. Research undertaken to determine by-catches of dolphins in the Romanian Black Sea area are also part of the National Action Plan for Dolphin Conservation, approved by the Minister of Environment Order No. 374 from September 3, 2004⁵.

Starting with 2008, all three species of cetaceans from the Black Sea are included in the Red List of the International Union for the Conservation of Nature by Dr. Alexei Birkun Jr. as vulnerable for *Delphinus delphis ponticus*⁶ and endangered for *Tursiops truncatus ponticus*⁷ and *Phocoena phocoena relicta*⁸.

If dolphin research projects in Romanian waters are lacking, their conservation projects have been developed over the years both by the National Institute of Marine Research and Development “Grigore Antipa” and NGO “Mare Nostrum”. The most important were:

- 2001-2003 the project “Action Plan for the Conservation of the Cetaceans from the Romanian Black Sea Area”, through the LIFE NATURA Program;
- 2005-2006 the project “Dolphin Conservation in the Romanian Coastal Area Through the Involvement of the Fishermen Community and Awareness of Visitors” through Small Grants Program (GEF/SGP)⁹;
- 2006-2007 the project “Assessment of the Extent of Present Cetacean By-catch and Strandings in the Romanian Black Sea Area”, funded by ACCOBAMS Secretariat¹⁰;
- 2009-present the research continues on the above mentioned project, funded through the Sectorial Operational Program.

EXPERIMENTAL

The data presented in the paper hereby were collected in studies presented in the “National Action Plan for Cetacean Conservation” and in “The Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area” recommendations 1.2, 2.6, 2.7 and 2.21.



The activities were made in accordance with the “Volunteer Guide for Monitoring Dolphins”¹¹ and “Recommendation for Reducing the Negative Impact of Fishing Gear on the Black Sea Dolphin Populations”¹² which are made in accordance with international standards.

RESULTS AND DISCUSSION

The works addressed in this study had the purpose of obtaining the necessary background data and scientific information to:

- establish the distribution and frequency of accidental catches or stranded dolphins at the Romanian seaside;
- equip with hydro-acoustic devices the fishing gears, considered dangerous for populations of dolphins, in the sense of decreasing catches;

Stranded or accidentally caught dolphin surveillance was done in the area between Sulina and Vama Veche, both on shore and at sea, up to a distance of 30-35 Mm (50-60 m isobath)

To obtain a larger data and information volume a “Working Plan“ was prepared. Among the actions foreseen in the plan and realized, the following can be included:

- distribution of observation sheets to partners from fishery points, fishing vessels, oil platforms, navy ships, ships of Border Police and other vessels.
- making expeditions along the coast to observe living dolphins and strandings.
- data and information collection from partners on dolphin movements near the shore;
- observing and checking fishery points regarding accidental catches of dolphins performed in stationary fishing;
- conducting joint expeditions by observers and collaborators of the five partners in the SOP project - NIMRD “Grigore Antipa”, NGO “Mare Nostrum“, Constanța Dolphinarium, Danube Delta Biosphere Reserve Tulcea, Agency for Fisheries and Aquaculture, Constanța Branch (NAFA), Border Police;
- establish the type of hydro-acoustic devices to diminish accidental catches of dolphins;
- revitalizing volunteer network for observing dolphins, network through which were made expeditions to observe the coastal sector throughout the year;
- realize a guide of recommendations for reducing the impact of fishing on dolphins;
- creating the website www.delfini.ro - a special page designed for problems that dolphins face, for information about dolphins and the host of the online database with data concerning the observations.
- establish a free phone line (TelVerde: 0800800078) for reporting various assaults on coastal ecosystem or to signal the presence of dolphins.

The expeditions made to obtain information on strandings/by-catch and fishing effort have been made with off-road vehicles (ATV type), motor boats, boats, NIMRD Constanța research vessel, inspection and patrol vessels of NAFA, Constanța branch and Constanța Border Police Inspectorate.

Dolphin observation was made using Nikon binoculars with a magnifying power 10x50. The shooting of stranded dolphins on shore and in situ was done with several types of devices:

- CANON 500D digital camera;
- SONY CCD-TRV145 digital video camera;

- Occasional cameras for certain cases of strandings;

The supervision of dolphins at sea was made with an inflatable motor boat - “Mare Nostrum“ (Fig. 1), research vessel “Steaua de Mare 1“, fishing boat (Fig. 2), Border Police patrol ship.



Fig. 1. RIB boat - “Mare Nostrum“



Fig. 2. Fishing boat

The details where cetaceans were observed, in situ or stranded, were taken with 2 GARMIN GPS devices:

- Vista

- Legend.

The trips to the economic agents and fishery points, to obtain data and information on acoustic devices functionality or on strandings/by-catches or presence of dolphins at sea, were done with the NGO “Mare Nostrum”’s car (Fig. 3) or with the ATV (Fig. 4). Also, the car was used in monitoring with volunteers.



Fig. 3. “Mare Nostrum”’s car



Fig. 4. ATV used for field work

Every year, since April, when the turbot fishing with gillnet starts a large number of stranded dolphins is recorded. Strandings come mostly from accidental catches carried out in nets for turbot fishing.

Although in the period April, 15th to June, 15th turbot fishing is prohibited^{13,14}, it is practiced illegally (poaching). This was found during the expedition organized with the research vessel “Steaua de Mare 1“, in the months May-June, 2010 and 2011, when, during the trawl survey with bottom trawl, turbot gillnet segments were recovered at different depths (30-45 m) at Tuzla, Constanța, Chituc and Corbu.

From records made on the ground and processing data and information, the distribution of strandings and by-catches of dolphins at the Romanian shore was established as follows:

• Structure of dolphin strandings in 2011

Overall, we can say that, during January-August 2011, there was a total of 80 stranded dolphins and the frequency of stranded dolphins in the three areas of the Romanian coast was the following:

- 48% in the Southern area (Cape Midia - Sulina);
- 18% in the central area (Constanța - Cape Midia);
- 34% in the northern area (Vama Veche - Constanța).

In terms of species composition and distribution in the field, the stranding situation during January-August 2011 was presented as follows:

1. *Delphinus delphis ponticus* was represented by two specimens, located in the southern Romanian coast and therefore with distribution of 100% in this area.

2. *Phocoena phocoena relicta* was represented by 73 specimens, located in the northern, central and southern areas and the distribution on the three sectors of the Romanian seaside in percent was as follows:

- 34% in the north;
- 19% in the center;
- 47% in the south.

Tursiops truncatus ponticus was represented by five specimens, located in the north, and south. The distribution along the Romanian coast was 40% in the northern area, 60% in the south.

Among the species of dolphins found in the field, most stranded individuals were reported of the species *Phocoena phocoena relicta*, 73 specimens (91%) compared to *Tursiops truncatus ponticus* [where were recorded five individuals (6%)] and *Delphinus delphis ponticus* where were recorded two (3%).

The largest number of dolphins, of the species *Phocoena phocoena relicta*, found stranded on the seashore can be attributed to the fact that this species is particularly vulnerable to accidental capture with gillnets especially when the mesh size and construction materials provided by the legislation in force are not respected.

The main cause of dolphins stranding is the death by asphyxia due to accidental capture in the gillnets or other fishing gears, but we must take into account that, in a reduced number, the strandings come from both the mortality caused by viral, bacterial diseases and natural mortality¹⁵.

• Structure of dolphin by-catches in 2011

The monitoring of accidental catches of dolphins, with the start of fishing activities on the Romanian seaside in 2011 and processing data and information, allowed the establishment of catch distribution by sector (Fig. 5), as follows:

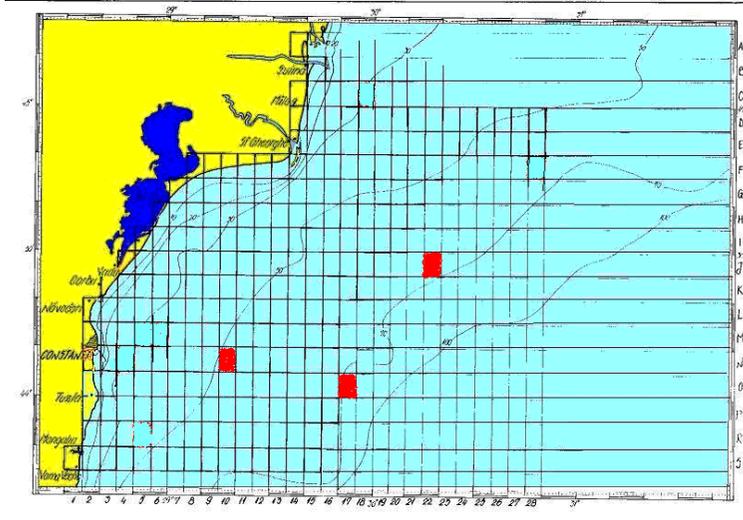


Fig. 5. By-catch distribution of cetaceans

- in May were recorded six dolphins accidentally caught of the *Phocoena phocoena relicta* species in turbot gillnets installed at a distance of 56 Mm from shore, at Chituc, square J22.
- in June were recorded 41 dolphins of the *Phocoena phocoena relicta* species, accidentally caught in turbot nets installed both in the right of Chituc and Tuzla, at a distance from shore of 56 and 71 Mm, respectively. Squares J22 and O17.
- in July were recorded 7 dolphins accidentally caught in turbot nets installed between Constanța and Tuzla, at a distance from shore of 14 Mm, square N10.

In terms of species composition, frequency and their distribution in the field, the catch situation was presented in the following way:

- all captured dolphins accidentally belonged to the species *Phocoena phocoena relicta*;
- the frequency of dolphins caught accidentally in the commercial fishing gear was 100% in the gillnet and their distribution was 13% in the central area, 61% in the southern area and 26% in northern area.

As stated, most or even all recorded catches of dolphins in gillnets belong to the species *Phocoena phocoena relicta*, which proved to be most vulnerable to this type of fishing gear. This vulnerability can be attributed to the small size of the body in relation to mesh size/softness of the yarn and the smaller reaction force than the larger species, when they get caught and entangled in the gillnets.

•By-catch limitation

Through the project “Improving the Conservation Status of Marine Biodiversity in the Romanian Coastal Zone, Particularly Dolphins“, project that funded the studies mentioned previously, we try to limit the by-catches with acoustic devices (pingers) mounted on the fishing nets.

Pingers (Fig. 6) represent technical means used to diminish the by-catches by emitting low frequency signals, perceptible to cetaceans.



Fig. 6. Aquamark pingers

The devices that are in course of testing are from Aquamark type, having 164 mm in length, 58 mm width, water weight - 135 g, maximum working depth - 200 m and their lifetimes is about 4 years according to the technical handbook¹⁶. These devices were installed on fishing nets of 5 trading companies with fishing activities at the Romanian seashore.

The results obtained so far are encouraging, but also reveal the rigor with which these devices must be used, because if they are not properly installed or during the installation on the nets one of these devices does not work, the results show that the area can be intercepted by dolphins as a crossing zone and the dolphins that try to avoid the sound field will be caught. Also, the devices must always be installed on the top of the fishing nets and not on the bottom, because there they can be covered with sand and thus the pingers will not work. Due to the short time of testing in the Black Sea Romanian waters, we cannot pronounce about their effects on the cetaceans behaviour for a long term. However, research will continue.

CONCLUSION

The main cause of dolphin strandings is the death by asphyxia due to accidental catch in the gillnets, but we must take into account that, in a reduced number, the strandings come from the mortality caused by viral, bacterial diseases and natural mortality as well.

According to our researches, it resulted that, in order to diminish the by-catches and the strandings, a few measures must be taken, as follows:

- use of a new type of fishing gear to be carried out only after the environmental impact study;

- size of the side mesh of the gillnets for turbot must not be smaller than 200 mm and the fineness of threads below 6.350 m/kg;
- conduct research to establish the optimal type of hydro-acoustic device for removing dolphins from fishing gear with high risk of accidental capture of these mammals;
- test the hydro-acoustic devices efficiency at the Romanian coast, to remove the dolphins from fishing gear with high risk of accidental capture of these mammals;
- fit the fishing gear with high risk of accidental capture of dolphins with the hydro-acoustic devices;
- report any catches of dolphins;
- intensify the control in fisheries by fisheries inspectors, Border Police and Environmental Guard;
- achieving a comprehensive system for monitoring fishing activities and landings, in collaboration with the industry to determine the optimal level of fishing gear, allowing ecosystem restoration and therefore dolphin recovery.

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