RESULTS OBTAINED IN THE FRAME OF THE ACCOBAMS PROJECT "ASSESSMENT OF THE EXTENT OF PRESENT CETACEAN BY-CATCH AND STRANDINGS IN THE ROMANIAN BLACK SEA AREA"

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ABSTRACT

The project *"Assessment of the extent of current cetacean by-catch and strandings in the Romanian Black Sea area"* started in April 2006 following the Decision of the ACCOBAMS Secretariat (Letter of Agreement 11/06) to grant financial support to this project. The beneficiary is the National Institute for Marine Research and Development "Grigore Antipa" Constantza, in partnership with NGO "Mare Nostrum".

The project was designed in four components:

The first component was destined to assess the extent of the by-catch problem in the Romanian Black Sea area, by type of fishing, by cetacean species and by sectors. It consisted in data collection by observers on board of fishing boats.

The second component consisted in establishment a correlation between the number, type, and technical characteristics of fishing gears and the number of stranded dolphins at the Romanian littoral. In the frame of the project, both the number and spatiotemporal distribution of fishing gears and also the spatiotemporal distribution of strandings were monitored.

The third component of the project was made for fishermen and decision-maker's awareness, aiming at drawing their attention to the need to mitigate the impact of fishing on cetaceans, at informing them about the practices and procedures to be followed to avoid by-catch, and accepting that the cetaceans are accidentally caught in their fishing gears.

The forth component was devoted to elaboration of recommendations regarding the mitigation of the fishing gears impact and establish the place and requirements for a rescue centre at Romanian littoral.

KEY WORDS : Black Sea, Romanian littoral, Black Sea cetaceans, *Delphinus delphis, Tursiops truncates, Phocoena phocoena*, strandings, awareness, rescue centre for dolphins

INTRODUCTION

The marine mammals living in the Black Sea Romanian littoral waters, represented by the three species *Delphinus delphis, Tursiops truncatus* and *Phocoena phocoena* are particularly vulnerable to a series of threats induced by diverse human activities. These threats are more severe in the Black Sea and Mediterranean Sea due to their character of semi-enclosed seas, high human densities, and activities developed especially on the coastal zones.

As there is already know, the abundances of the three species known a dramatic decline in 20 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 habitats degradation (BIRKUN, 2002).

Annually, at the Romanian littoral there are registered dolphin incidental catches and implicitly mortalities which reach on the beaches as strandings, especially pertaining of *Phocoena phocoena*, considered the most vulnerable in the fishing using gill nets for turbot, sturgeons and spiny dogfish (ANTON *et al.*, 2006; RADU, 2005; RADU *et al.*, 2003, 2006).

Fishery-cetacean interaction represents an issue affecting highly the conservation of dolphin populations, through:

a/ incidental mortality produced by retention and entanglement in fishing gears;

b/ diminishing of food resources for dolphins (dolphin are situated in the top of trophic chain) through over-fishing, illegally fishing, benthic biocoenosis disturbance and degradation of specific habitats of marine living resources.

In these conditions, the project proposal was done taking into account the following:

- **Recommendation 1.2** of ACCOBAMS Scientific Committee (SC) **on by-catch** in response to Implementation Priorities no. 2 and 3 adopted by First Meeting of the Parties (MOP1) it was suggested that this matter be brought to the attention of the Parties as soon as possible, in order to allow the Secretariat to obtain updated information on cetacean by-catch in the Agreement area on an annual basis.

- **Recommendation 2.6** of SC **on national stranding networks** (urging the Parties to develop appropriate network …, and send the information to MEDACES).

- **Resolution 2.7** of MOP2 **- WORKING PROGRAM 2005-2007** gives the list of actions which at items 3 and 4 comprises the problems included in the Project.

- **Resolution 2.21** of MOP2 **- Assessment and Mitigation of the Adverse Impacts of Interactions between Cetaceans and Fishing Activities in the ACCOBAMS Area** pointed the action program aimed to mitigate cetacean by-catch.

The Project aims also providing a basis for implementing the recommendations of many others international agreements and conventions as for alleviating the impacts of human activity on cetacean population.

In this context, the ACCOBAMS Agreement states that Parties shall "develop and implement measures to minimize adverse effects of fisheries on conservation status of cetaceans" (Annex 2, 1, a), "collect and analyse data on direct and indirect interactions between humans and cetaceans in relation to, *inter alia*, fishing…" (Annex 2, 2) and "When necessary, …..take appropriate remedial measures…" (Annex 2, 2).

MATERIAL AND METHODS

The project started in April 2006 following the Decision of the ACCOBAMS Secretariat (LETTER OF AGREEMENT 11/06) to grant financial support and was finished in March 2007. The beneficiary is the National Institute for Marine Research and Development "Grigore Antipa" Constanta in partnership with NGO "Mare Nostrum".

This was designed in four components:

The first component was destined to assess the extent of the by-catch problem in the Romanian Black Sea area, by type of fishing, by cetacean species and by sectors. It consisted in data collection by observers on board of fishing boats.

The second component consisted in establishment a correlation between the number, type, and technical characteristics of fishing gears and the number of stranded dolphins at the Romanian littoral. In the frame of the project, both the number and spatio-temporal distribution of fishing gears and also the spatio-temporal distribution of strandings were monitored.

The third component of the project was made for fishermen and decision-maker's awareness, aiming at drawing their attention to the need to mitigate the impact of fishing on cetaceans, at informing them about the practices and procedures to be followed to avoid by-catch, and accepting that the cetaceans are accidentally caught in their fishing gears.

The forth component was devoted to elaboration of recommendations regarding the mitigation of the fishing gears impact and establish the place and requirements for a rescue centre at Romanian littoral.

These components have been realized through the following activities:

1. Collecting of data about the current cetacean by-catch in the Romanian Black Sea area, by type of fishing, by cetacean species and sectors;

2. Monitoring the dolphin stranding in the Romanian littoral due to interaction with fishing and reactivate the national stranding network;

3. Rising the fishermen and decision-makers awareness about the need of mitigating the impact of fishing on cetacean populations;

4. Elaborating the recommendations regarding the mitigation of the impact of fishing gears, including establishment areas for special interest for protection of bottle-nose dolphin and harbour porpoise;

5. Establishing TORs for a national rescue centre for dolphins.

Action 1 was realised in two phase:

- The first phase has involved the review of current data available regarding the interactions between fisheries and cetaceans, also strandings found within the Romanian marine area (RADU *et al*., 2006) .

- The second phase involved the collection of field data according to two different but complementary methods (RADU G., 2005; RADU G. *et al*., 2006):

  - by observers on fishing boats;

  - by a questionnaire distributed to a set of volunteers, both for the collecting the quantitative data on the occurrence of by-catch in fishing gear known to have a low impact on cetaceans.

The observers were designated by NIMRD among the high qualified personnel from the Department of fishing resources, who have collaborated for many years with the fishermen. Also, was a very good collaboration with Border Police and Fishing Inspection.

Action 2. The volunteers network established within the Project Life-Nature "Conservation of the dolphins from the Romanian Black Sea waters" was reactivated and improved (RADU G. *et al*., 2006).

The action was coordinated by NIMRD and carry out with the support of NGO Mare Nostrum. Also, NIMRD has used the collaboration agreements concluded with Border Police, Romanian Waters Administration - Dobrogea Litoral, Environmental Protection Agency Constanta and Tulcea, "Danube Delta" Biosphere Reserve Administration.

The monitoring period was March-October 2006.

Action 3 regarding the awareness of fishermen and local and governmental decision makers was implemented by NGO Mare Nostrum, in collaboration with NIMRD Constanta. The activity consisted mainly in

achievement of posters and leaflets for distributing in main ports and fishing units. The ACCOBAMS Secretariat and Scientific Committee was consulted before printing.

Action 4 and 5. The finalizing of the recommendations was made after a working meeting at national level. It was organized by NIMRD Constanta, with participation of representatives of fishery organizations and local and governmental decision makers. After a presentation of the obtained data during the monitoring period, the recommendations prepared by NIMRD were discussed. The final form of recommendations comprised in an Action Plan was sent to the Ministries of Agriculture and Environment.

PROJECT LOCATION

Placed in the eastern part of Romania, the Black Sea is a semi-enclosed basin, with an area of 413,000 km^2 and a mean depth of 1,197 m. Its intercontinental position, the influx of fresh waters from its tributary rivers and the hydrological factors make from this sea an "*unicum hydrobiologicum*", being the highest anoxic basin from the World Ocean. The North-western corner of the Black Sea, where are the Romanian littoral and the adjacent shelf, is a shallow zone, with an area of 63,900 km^2 and a volume of 1,910 km^3 (Fig. 1).

Fig.1 - Position of the Black Sea

The Romanian Black Sea coastline extends for over 240 km, can be divided into two main geographical and geomorphologic sectors (Fig. 2):

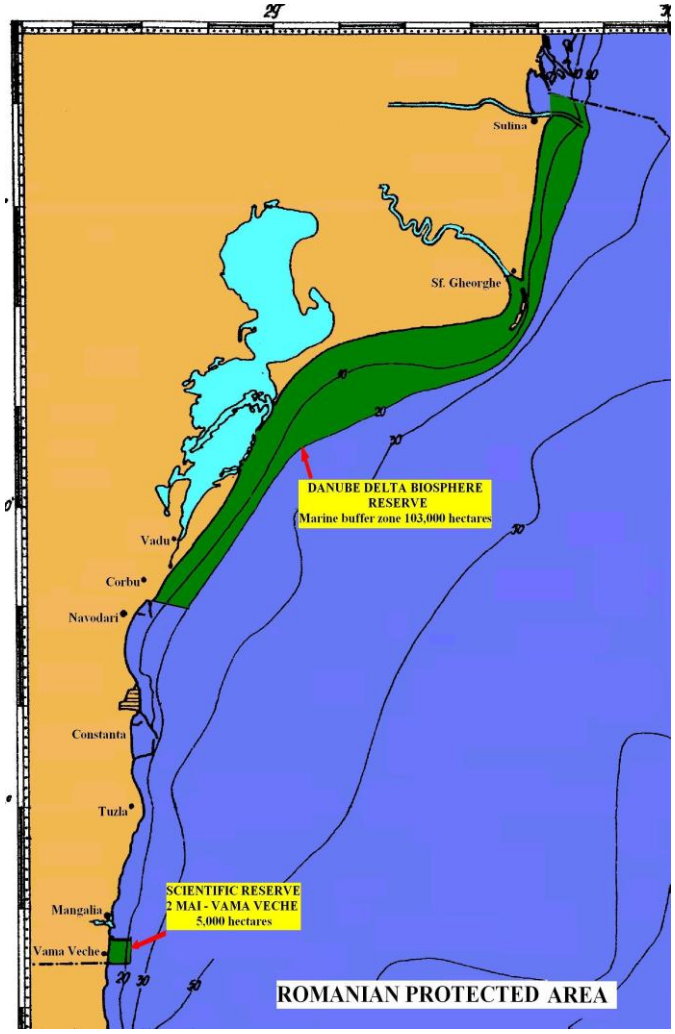

Fig. 2 - Romanian marine protected areas

- 1/ the northern sector (about158 km in length) lies between the secondary delta of the Chilia branch and Constantza, constituted of alluvial sediments;

- 2/ the southern sector (about 85 km in length) lies between Constantza and Vama-Veche characterised by promontories with active, high cliffs, separated by large zones with accumulative beaches often protecting littoral lakes.

The distance from the sea shore to the shelf limits (200 m depth) varies from 100-200 km in the northern sector to 50 km in the southern one. The submarine slope of the shelf is very gentle in the north, with the 10 m depth in

front of Danube mouths, while in the southern sector the 10 m depth is nearly 1,5 km offshore.

The shallow waters up to 20m depth of the northern part are included in the Biosphere Reserve of Danube Delta (declared through the Low no. 82/1993) (Fig. 2).

The marine zone of the "Danube Delta" Biosphere Reserve" constitutes a traditional zone for spawning and feeding for transboundary species as well as a passage route for anadromous species (sturgeons, Danube shad).

In the South part of littoral is situated also the Vama Veche - 2 Mai reserve with the surface of 5000 hectares.

The marine Reserve 2 Mai - Vama Veche is an area with a high diversity of the biotops and biocoenosis, being settled on the migration routes of the main pelagic and benthic fish and marine mammals (Fig. 2).

RESULTS AND DISCUSSIONS

1. Collecting of data about the current cetacean by-catch in the Romanian Black Sea area, by type of fishing, by cetacean species and sectors

In order to assess the presence and extent of dolphins incidental catch in Black Sea Romanian region, NIMRD Constanta organized land-based and sea-based surveys alone or in collaboration with Frontier Police Constanta, "Danube Delta" Biosphere Reserve Administration, Commissariat of "Danube Delta" Biosphere Reserve of Environmental Guard Tulcea.

Following the investigations and observations in the field carried out in 2006, there were registered four situations when dolphins incidental catches were identified in the industrial fishing with gill nets:

- 11.04.2006, 11 individuals of *Phocoena phocoena* were entangled and hung up in turbot gill nets launched by the Turkish vessels; the gill nets were recovered by the VM35 vessel of Border Police (fig.3);

- 07.07.2006, 2 individuals of *Phocoena phocoena* and 1 individual of *Tursipos truncatus* were entangled in Turkish turbot gill nets. Their recovery was achieved by the MAI-1104 patrolling vessel pertaining to Border Police Constanta;

- 10.07.2006, 6 individuals of *Phocoena phocoena* were entangled in sturgeon gill nets settled by the poachers from Sulina town;

- 27-28.07.2006, 1 individual of *Phocoena phocoena* and 1 individual of *Tursipos truncatus* were entangled in Turkish turbot gill nets.

Fig. 3 - Incidentally caught dolphins in the Turkish gill nets, recovered by the patroling boats of Border Police Constanta

2. Monitoring the dolphin stranding in the Romanian littoral due to interaction with fishing and reactivate the national stranding network

In order to obtain the necessary data and information for the dolphins stranded on the Romanian beaches a few activities were developed:

- organization of the land-based and sea based surveys along the Romanian littoral,

- collaboration with the administrative, patrolling and controlling institutions, such as: Direction of Waters "Dobrogea Litoral", Brontier Police Constantza, National Agency for Fishing and Aquaculture Constantza, "Danube Delta" Biosphere Reserve Administration, Commissariat of "Danube Delta" Biosphere Reserve of Environmental Guard Tulcea, Mare Nostrum NGO Constantza, Museum Complex of Natural Science Constantza, Environmental Protection Agency Constantza, etc..

Started a few years ago, the collaboration among NIMRD and above mentioned institutions were intensified in 2006 resulting in the gathering of a great deal of data and information able to mirror the real situation in the field, and finally the elaboration of the measures and recommendations necessary for decision makers for minimizing the mass mortalities produced by the dolphin incidental catches in the turbot gill nets.

The Table 1 presents the situation of dolphin strandings registered between March and September in 2002 -2006 period and the spatio-temporal distribution is depicted in the fig. 4 (RADU G., 2005; RADU G. *et al*., 2006).

Table 1

Dolphin strandings (deads) in 2002-2006 at the Romanian Black Sea littoral

Year	March	April	May	June	July	August	September	Total
2002	1	7	39	4	1	2	2	56
2003	-	5	18	3	83	10	-	119
2004	-	5	4	7	-	1	1	18
2005	-	3	13	2	18	3	2	41
2006	6	9	30	20	35	1	3	104

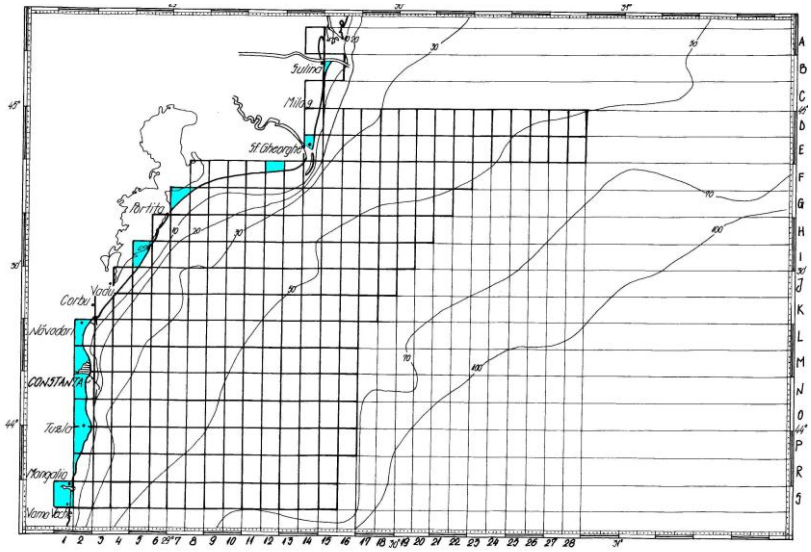

Fig. 4 - Distribution map of dolphin strandings, in March-September 2006 at the Romanian Black Sea littoral

3. Rising the fishermen and decision-makers awareness about the need of mitigating the impact of fishing on cetacean populations

As there was stipulated in the description of the action was focused to the raise of the degree of information and awareness of the fishermen employed in fishing enterprises acting at the Romanian Black Sea littoral and decision makers, to the local people and tourists which visited the Romanian resorts in summer 2006, regarding the minimizing the impact of fishing on the dolphin populations.

The responsible for the implementation of this action was NGO Mare Nostrum Constanta. In order to fulfil the action's purpose, the Mare Nostrum team, in compliance with the NIMRD team, decided to use the following type of activities and promotional and information materials:

1. Meetings and discussions with fishermen (Fig. 5);
2. Editing of leaflets, posters for fishermen, and leaflets for local peoples and tourists;
3. Inscription of a number of shirts, caps, bandanas with dolphin images and slogans for public involving in the dolphin protection.
4. Dissemination of leaflets and posters to the target groups (Fig. 6, 7, 8, 9).

Fig. 5 - Festival of the fishermen

Fig. 6 Leaflets for fishermen

Fig. 7 - Leaflets for tourists

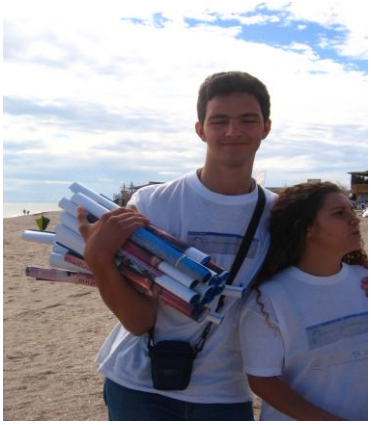

Fig. 8 - Distribution of the promotional materials

4. Elaborating the recommendations regarding the mitigation of the impact of fishing gears, including establishment areas for special interest for protection of bottle-nose dolphin and harbour porpoise

In conformity with working program, NIMRD Constanta organised at his headquarter a workshop (Fig. 10) where was analysed the draft of the **Action Plan** regarding the mitigation of the impact of fishing activities on cetaceans from the Romanian Black Sea area. At this meeting participated specialists from NIMRD Constantza, stakeholders, representatives of the fishery organizations, representatives of local and national decision-makers, militants from ONG Mare Nostrum etc.

Fig. 9 - Shirts, caps, bandana

Fig. 10 - Images from workshop on Action Plan

The action was finalized with the elaboration of the Action Plan for to minimize the fishing activities impact on the dolphins from the Romanian Black Sea zone. Some of the objectives and actions included in this Plan can be found also in the National Action Plan on the Conservation of Cetaceans (approved by the Environmental and Waters Management Ministry, no. 374 Order, September 3, 2004) (RADU G. *et al*., 2006).

5. Establishing TORs for a national rescue centre for dolphins

One of the objectives foreseen in the Project was the identification of the most suitable place for to set up a Rescue Centre. Taking into consideration the requirements for a rehabilitation centre the location proposed by the NIMRD is the section Dolphinarium from the Museum Complex of Natural Sciences from Constanta (Fig. 11). In the following, we try to motivate our proposal, through the description of the infrastructure and endowments already existing in this location, as well as the research and visitors education abilities.

Fig. 11 - Dolphinarium Constanta

a. Infrastructure

a/ *Pools* – The Dolphinarium has three pools:

- outdoor semicircular pool, having 22 m length, 12 m breadth, 4.5 m depth, 1,200 m^3 capacity (Fig. 12);

- indoor oval pool, 22 m length, 8 m breadth and 2.5 m depth, 500 m^3 capacity (Fig. 13);

Fig. 12 - Semicircular outdoor pool

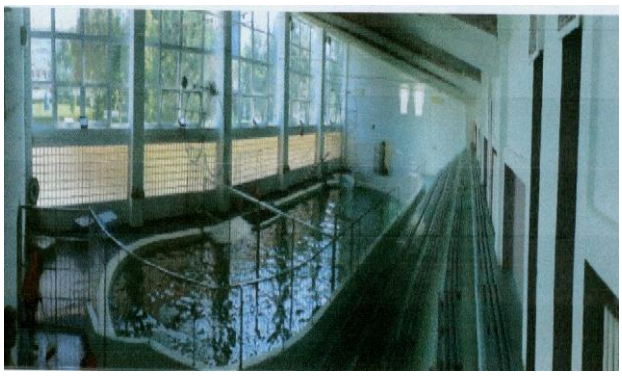

Fig. 13 - Oval indoor pool

- quarantine parallelepiped pool, 10 m length, 6 m breadth, 2.5 m depth, 160 m^3 capacity (Fig. 14). All the pools were rehabilitated in 2005, fulfilling the international CCAC Guide requests.

- kitchen, with water supply, boiler, refrigerator, stainless tables, balances (Fig. 15).

Fig. 14 - Quarantine parallelepiped pool

Fig. 15 - Kitchen

b. Water and air quality from pools and precincts

- *Water supplying* – the sea water is provided by a proper station pump, and 800 m pipe length ;

- *Filtration* is necessary for maintaining a high quality of water in pools; the filtration system must be efficient for to remove the animal dejections, preventing the micro-organisms multiplication, maintaining of high water transparency, etc. In Dolphinarium from Constanta it is used a semi-

open filtration system, which assure to partial replacement of the water (depending the necessities).

- *Chemical treatment of water*. Besides the filter, a few chemicals are used in order to remove the micro-organisms, algae and metabolic compounds produced by the animals: sodium hypochlorite, ozone, Cooper salt, etc.

- *Light*. All the pools are natural lighting all long day. During winter, the artificial lighting is made using UV lamps.

- *Temperature*. Excepting the outdoor pool where the temperature is oscillating depending on the season, both the water and air temperature remain constant (26-27^{o}C in summer, 18-20^{o}C in winter).

- *Air ventilation* is assured using air conditioned system (only in indoor pools).

- *Noise*. The pools are far away enough so the noise is a little perceptible for animals.

c. Personnel

20 persons are employed presently in the Dolphinarium: 6 biologists (2 PhD, 1 candidate for a doctor's degree); 1 veterinary doctor; 1 veterinary technician; 1 diver; 1 food preparatory; 6 qualified workers; 1 custodian manager.

There are also three qualified trainers for training animals and performing public spectacles, the institution being settled especially for to develop such activity in 1972.

d. Capabilities of research/education/awareness

Ever since 1972, when the Dolphinarium was established in Constanta, first one from the South-Eastern Europe at that moment, the research workers have developed an intense and prolific activity of research and public education and awareness regarding the dolphins living in the Black Sea waters.

The studies were carried out both on the captive and stranded animals, have in view the following issues: ecology, aetiology, intra-specific relationships in captivity, seasonal movements, trophic resources, diseases, feeding, social and reproductive behaviour, etc.

CONCLUSIONS

- The project started in April 2006 and was finished in March 2007;
- This was designed in four components:
  - assessment of the extent of the by-catch problem;

- establishment a correlation between the number, type, and technical characteristics of fishing gears and the number of stranded dolphins at the Romanian littoral;

- fishermen and decision-maker's awareness;

- elaboration of recommendations regarding the mitigation of the fishing gears impact and establishment the place and requirements for a rescue centre at Romanian littoral.

- In 2006 there were registered four situations when dolphins incidental catches were identified in the industrial fishing with gill nets;
- Also, in 2006 have been recorded 104 stranded cetaceans;
- The fishermen and decision - makers awareness was realised through the following type of activities and promotional and information materials: meetings and discussions with fishermen; editing of leaflets, posters; inscription of a number of shirts, caps, bandanas with dolphin images and slogans for public involving in the dolphin protection; dissemination of leaflets and posters to the target groups.
- Recommendations regarding the mitigation of the impact of fishing gears are incorporated in the Action Plan for minimizing the fishing activities impact on the dolphins from the Romanian Black Sea zone;
- Taking into consideration the requirements for a rehabilitation centre and the infrastructure and endowments already existing, the location proposed by the NIMRD for a rescue centre is the section Dolphinarium from the Museum Complex of Natural Sciences from Constanta.

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