

**Agenda Item 5.1.2: Effects of pollution, noise pollution and disturbance:
 Military activities**

**The influence of active SONARs on marine mammals:
A new concern for the Belgian defence**

Submitted by: Belgium



NOTE:
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The influence of active SONARs on marine mammals: A new concern for the Belgian defence

**Workshop at the Belgian Army Headquarters,
Brussels, 28 June 2004**

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Introduction

The workshop was organised by the Belgian Navy and Isabelle NOIROT, former researcher at NATO Undersea Research Centre, NATO URC (formerly called SACLANT Centre), Italy. It was attended by 17 people: officers from several relevant Departments of the Belgian Defence, researchers from the NATO URC (Mike CARRON, Rene LATERVEER and summer research assistants), staff members of the federal environmental conservation administration (MUMM/RBINS) and Dr. Ron KASTELEIN of Seamarco, The Netherlands. The purpose of the workshop was to inform the audience about the issue of the possible impacts of active sonars on marine mammals, to determine possible options and mitigation procedures for the future, and to network key players in maritime matters.

Since 1998 NATO has shown an increasing interest in studying the impacts of active sonars on marine mammals. In June 1998, NATO URC convened a Bioacoustics Panel of Experts to provide an opinion on a Cuvier's beaked whales *Ziphius cavirostris* stranding in Kyparissiakos Gulf, Greece in May 1996. That stranding occurred while NATO R/V *ALLIANCE* was performing nearby tests with Low Frequency Active Sonar (LFAS) and mid-FAS. It was therefore suggested that the stranding might have been due to that sonar exercise. Due to a lack of appropriate anatomical data, the panel concluded that an acoustic link could neither be clearly established nor eliminated as a cause of the stranding. The panel strongly recommended appropriate environmental assessment procedures to be implemented as soon as possible, with a view to recommending suitable mitigation and monitoring protocols. As a result, NATO URC created in 1998 the SOLMAR project to alleviate the lack of knowledge and to propose risk mitigation procedures and tools to be used by NATO URC scientists and engineers during acoustic operations at sea.

Summary of the workshop

Talks

Isabelle NOIROT first gave a short introduction on underwater noise propagation.

She then presented an overview of the several incidents involving mass strandings of beaked whales, later related to the use of certain types of active SONAR. Beaked whales are very vulnerable to low and medium frequency sounds produced by active SONARs. The different theories for this vulnerability were put forward. The main difficulty about investigating these impacts is that it can be hard to detect a cetacean: when not vocalising under the surface, passive acoustics is not sufficient and when at the surface, during night time or when the sea is rough, the visual monitoring won't work. Isabelle NOIROT presented information on whales' reactions to man made sounds and the way the reactions could be studied. Looking at the difficulty to assess the impacts, the two conclusions of the second talk were:

- (1) it is necessary to pursue long term research, such as in the SOLMAR project;
- (2) mitigation procedures should be applied during the use of active SONAR, until thorough knowledge exists about the impacts of man made sounds on marine mammals.

After this introduction, the third talk was focused on the objectives and results of the SOLMAR project. The goals of the SOLMAR project are to develop and implement a Marine Mammal Risk Mitigation Policy (MMRMP) and a cetacean density prediction capability. This is being done in the annual SIRENA cruises executed in the Mediterranean Sea. These cruises include careful controlled acoustic exposure experiments on sperm whales to help understand impacts of LFAS and Mid FAS on this species, before implementing a similar MMRMP for beaked whales.

Protocols used by NATO URC MMRMP are the following:

- For impulsive sources, the minimum safety range is 2000 m for all marine mammals.
- For coherent sources, the Received Level should not exceed the following levels (re 1 μ Pa):
 - Small Odontocetes:
 - Frequencies \leq 3 kHz: 186 dB
 - Frequencies 3 - 20 kHz: 181 dB
 - Frequencies 20 - 75 kHz: 178 dB
 - Mysticetes and Large Odontocetes:
 - Frequencies \leq 100 kHz: 160 dB

Maximum continuous duration of sonar transmissions is to be less than 100s, duty cycle less than 20% and total cumulative exposure maximum 3 hrs in 24 hrs. As far as practicable the safety zone, which is subject to higher noise levels, should be monitored during the experiment.

The source should be ramped up gradually from 150dB re 1 μ Pa @ 1m or lowest possible setting if higher than 150dB re 1 μ Pa @ 1m. If no evidence exists of marine mammals within the safety range, then the operations can begin after ramp-up. Otherwise, the area clearance operation should be repeated as well as the ramp-up procedure.

After these talks about the biological implications of the use of active SONARs, Commander Thierry PARIS (Belgian Defence) gave information about the different types of SONAR that are being used and developed, and the reasons for which they are developed. The main objective is to maintain a capacity to detect submarines of non-NATO nations that might undertake unfriendly actions against nations of the Alliance. For the moment, Belgian frigates are equipped with medium frequency, medium power SONAR. On average, 34 hours per month are spent in training exercises on the field with this SONAR.

The Belgian Navy is concerned with the possible environmental impact of the use of such equipment, and would like to install procedures to minimise the possible impact (e.g. a MMRMP). For such procedures, it is of prime importance to have a scientific basis. The Belgian navy has been involved in the scientific research undertaken at NATO URC during the last years, and will be in the future, by – amongst others - offering dedicated researchers (biologists) research/training grants. To develop risk mitigating procedures, a training of the personnel on board frigates, and an exchange of information (eg. on the abundance and distribution of cetaceans and on potential risk areas) will be necessary.

Discussion

After the introductory talks, Commander Jan DE BEURME (Belgian Defence) led a very open discussion. It is clear that the Navy is very concerned about the possible environmental impact of the use of active SONARS. The following points were made:

- The Navy agrees that it is necessary to make PR efforts, on a regular basis, in order to balance the picture the public has of the development and use of certain types of SONAR and the possible impacts on cetaceans. The Navy needs to inform the public of the necessity to develop and use this type of SONAR, and of the concern the Navy itself has about using this equipment.
- Scientific research is vital to assess the impacts, and therefore funding is absolutely necessary.
- The problem should be put in perspective (how big is the problem really, compared to, for instance, the bycatch problem?).
- Navy personnel need to be educated to get acquainted with the possible environmental consequences of the use of this equipment. It is important to fix – on a scientific basis - procedures ('directives') for the use of these SONARs, and to train people using these procedures. Also scientists need to be educated to understand the need to develop and use these SONARs. To achieve this, a greater exchange of information will be needed. This workshop proposed by Jan DE BEURME and Isabelle NOIROT was a good proof of the willingness of co-operation between the two worlds: people of both worlds were at the table to discuss the different points.
- The military are exempted from some of the Decrees concerning environmental conservation. A voluntary protocol for marine mammal protection, signed by the military, would indicate the importance the military are giving to the problem, and could be well received by the public. Existing marine mammals risk mitigation procedures are applied on board Belgian Navy vessels as a trial.
- MUMM informed the meeting about the concern existing – amongst others - within ASCOBANS for the problem with the use of active SONARs, and the necessity for a better communication between the military and scientists (both ways). The possible impacts of these types of SONAR were also a subject of requests of the EC for information and scientific assessment by ICES. MUMM requested the Navy information about current procedures when using SONAR on frigates.

A report of this meeting, including summaries of the talks, will be prepared. A short report will be presented to the next ASCOBANS Advisory Committee Meeting.

It is necessary that a follow-up meeting will be held within between six months to a year time. A similar meeting had been held in the Netherlands some months ago. Given the close co-operation of the Belgian and Dutch Navies, a follow-up meeting will be joint Dutch-Belgian.