

February 4, 2002

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Our ref.: HHA/mli

Report no.: 02-293

Project no.: 11746

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Verified:

Approved:

Basic Study/Surveillance of Porpoises at Horns Rev

1. Status of the Surveillance in the Period 2001 - April 2002

1.1 Purpose

The purpose of the surveillance is to provide sufficient visual and acoustic data for evaluation of the 'natural' variation in the distribution and stock of porpoises in the planned wind farm area and the potential extension area in the western part of Horns Rev. Based on tests of the statistic strength it is assumed that a total of 50 observations of porpoises in the wind farm area and one of the three reference areas before the wind turbines are erected will provide sufficient data to detect possible changes to the distribution of porpoises of more than 25%. The statistic strength of the acoustic data has not yet been defined, but is expected to be higher. The program does not include studies of the animals' possible reaction to piling of the transformer station in September.

1.2 Method

A combination of visual ship-based surveys (with assistance of a mobile hydrophone) and acoustic stations (stationary hydrophones) is used. As the sensitivity of the program presupposes a known water mass type for each registration of porpoise, hydrographic data are collected simultaneously with the visual and acoustic data.

1.2.1 Use of Equipment

The visual surveys are made by three observers from a boat with an observer's platform 7 m above sea level. The observations of porpoises were made by means of a pair of binoculars (8×56 and 10×56), range finder, square dial and GPS. The collection of the hydrographic data during the surveys was done by means of a mobile salinometer continuously measuring the water salinity and temperature at 3.5 m depth. As an experiment it was tested, whether it would be possible to test the efficiency of the visual

observations by dragging a hydrophone after the boat. Unfortunately, this experiment failed and only insufficient data were collected. We have hopes, however, that the problems of collecting acoustic data at a relatively high speed will be solved before future expeditions.

A number of relatively expensive equipment was bought in 2001. These purchases are expected to be one-off, implying that the costs for equipment will be kept at a minimum for the next years.

The stationary (acoustic) data are collected by means of hydrophones (so-called PODs). The hydrographic measurements made synoptically with the stationary hydrophones are made by means of two stationary salinometers measuring in five depth intervals. Owing to a delayed delivery of the two salinometers, model data are collected from DHI's water model in the period until mid October 2001. PODs, stationary salinometers and model data are paid directly by Tech-wise A/S. The statistic preparation of the collected data among other things include the use of advanced programs for modelling of the distribution of the animals.

1.2.2 Extent

Each expedition sails through the area of Horns Rev at 15 east-west-going transectlines from the coast of Jutland to the most westerly part of the reef. A total of eight PODs are placed in the area, two in the wind farm area and two in each of the three reference areas.

1.3 Accomplished Surveys

As planned, two expeditions were carried out on Aug. 21-24, 2001 and Aug. 28-29, 2001, respectively. Six stationary hydrophones were put down by the end of July and the last two around Oct. 1, 2002.

1.4 Co-operation

The program is accomplished in a close co-operation with the Danish National Environmental Research Institute (DMU) and the Danish Institute for Fisheries Research (DFU). Among other things, this co-operation will ensure that the hydrophones at Rødsand and Horns Rev are making similar measurings and that the development of suitable measuring programs for porpoises in relation to offshore wind turbines is coordinated between the institutions involved.

1.5 Budget for the Rest of 2002

The present contract covers activities until Apr. 1, 2002. Approx. 30% of the time budget in connection with reporting for this period remains.

2. Porpoises, Status for the Last Six Months of 2001

2.1 Summary

After a minor disagreement with The Royal Danish Administration of Navigation and Hydrography as to whether to equip the buoys with lights or not and which type of buoys to use, the first PODs were put down in July.

The buoys used are very fine ones with lights, which are, however, more costly to the project than first expected. Maritim Consult delivered the eight buoys including anchoring and cordage. However, some of this equipment has been replaced as it could not stand up to the rough conditions in the North Sea. Among others, the chain (6 mm) connecting the POD to the anchorage has been/will be replaced, as it digs itself into the sand and cannot be pulled free without breaking. The chain has been/will be replaced by Taifun wire, which is made of nylon with a core of steel wire in each winding.

2.2 Introduction

The project is now in its second year, but it has not been without problems to get this far. To begin with, the weather at the North Sea has to be considered in all aspects and has in periods delayed the work with putting down measuring equipment. The largest problem, however, has been the lack of respect shown to equipment and buoys; buoys and moorings are constantly run into to, which has resulted in extra costs for cordage etc.

2.3 Project Status

By beginning of the year, 8 PODS and two salinity loggers were put down; however, one of the PODs has for certain disappeared.

Further has been reported that a marking buoy has disappeared, but as it has been seen before that equipment has moved as far away as 3 Nmile, it is not for certain that it has disappeared. The latest news are that a light has been removed from one of the buoys and that it has been done on purpose as there are no signs of direct damage, - the light has been removed by means of tools.

Data from the measurements are collected and sent directly to DMU. These data have been described as 'good' but in a few cases the logger has 'run full' after only two weeks of a 2 month period, owing to noise from screws.

The two salinity loggers have been working since Oct. 13, 2001 (no. 1) and Nov. 24, 2001 (no. 2).

2.4 Essential Changes as compared to the Annual Program

In 2002, the following new activities will take place:

- If it is financially justifiable, the buoys will be equipped with GPS location equipment.
- The measuring equipment will be fastened in a strong 'cage', which will also make out the anchoring block of the buoy. This should prevent trawlers and other fishing vessels sailing close by the buoys from getting the equipment into their net, which happens the way the equipment is mounted today.

2.5 Enterprise and Information

It was desirable to have the eight positions divided into two parts regarding time, to be able to maintain them during one maintenance expedition each month, and the budget was made on this assumption. However, there have been rather many unexpected costs owing to e.g. replacement of moorings and it has been difficult to keep the budget.

2.6 Conclusion

After the actions taken (item 2.4) things should begin to work according to the plan. However, another report of a stolen light from one of the buoys has just been received, but this - and direct collisions - can apparently not be avoided.