

Interim report on

Harbour seal satellite monitoring program, Horns Reef, North Sea

Activities in preceding 6-month period, Jan. – June 2002

A total of 10 harbour seals were caught on three separate occasions on the islands of Rømø and Mandø and tagged with satellite linked position and time-depth recorders. The first transmitters were deployed in early January 2002 and the last transmissions were received in late June/early July. The transmitters provided detailed information on the movement of the animals in the Wadden Sea and the North Sea as well as detailed information on dive and haul-out behaviour.

Aim of activities

Due to late start of the program and hence late ordering of transmitters only the first seven seals were tagged before construction start of the wind farm. Baseline information on the behaviour of the seals and their use of Horns Reef and surrounding areas are available from these seven animals and partly from the remaining three.

From previous taggings with VHF-transmitters it is known that harbour seals often leave the Wadden Sea and presumably forage in the North Sea. It was not possible, however, to tell how far out they went and exactly where they spend their time. This information is now available but as recommended by the IAPEME a continuation of the monitoring with ARGOS transmitters or the newly developed GPS/GSM tagging system will be necessary to provide data needed for defining the ecological importance of the habitat and the potential impact of the windmill activities. If a new batch of transmitters are deployed after the construction of the wind farm it will be possible to assess whether the seals' use of the reef and surroundings change because of the presence of the mills.

Status

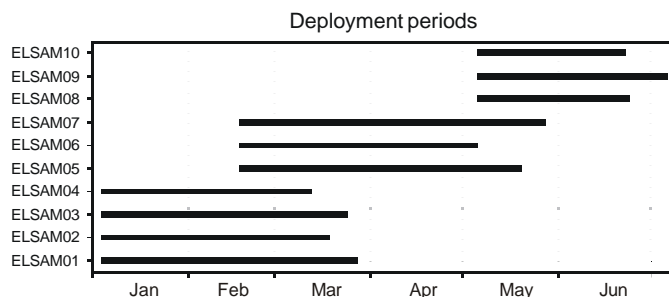
Ten seals (5 males, 5 females / 3 pups, 4 juvenile and 3 adult) were caught on the northern tip of Rømø (Bollert Sand) and the southern tip of Mandø (Koresand), using a large net deployed by the Rescue Boat from Havneby and were equipped with satellite transmitters.

The transmitters (Wildlife Computers, SDR-T16) contains a depth sensor and continuously collects dive data (dive depth, dive duration and time spent at various depths). This information is collected over six hour periods and transmitted to orbiting weather satellites (service provided by the company ARGOS). If two or more transmissions are received by the same satellite on the same passage the position of the transmitter can also be estimated. From the satellites the data are later downlinked to ground-stations and can be downloaded from ARGOS' servers.

The transmitters in general met expectations. Data were received from all transmitters on the day of deployment and they continued to transmit daily up to the end of their functional lifetime. Median lifetime was 77 days (range 49-100) and median number of transmissions was 28,500 (range 14,100-37,600). Batteries were specified to deliver power for 30.000 transmissions. The three transmitters deployed in May all had significantly shorter lifetimes than expected. From battery voltage information transmitted it is concluded that they fell off the seals (due to the seals moulting their fur) and not ceased due to battery failure.

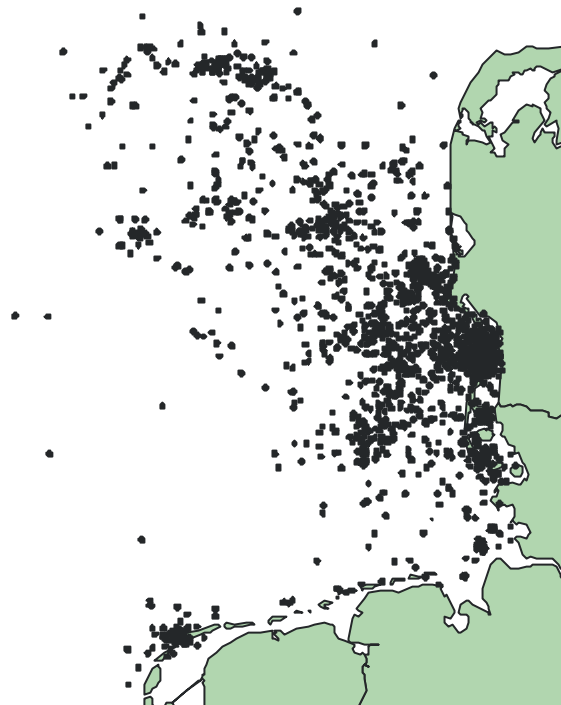
All transmitters provided position data and dive data. More than 10,000 uplinks were received, of which 60% are usable (the remainder were corrupted during transmission). Of all transmissions sent by the transmitters 3.5% were intercepted by the satellites. This figure may seem low, but is well within what to be expected based on the limited satellite coverage.

Nearly 2,500 positions were received from the 10 transmitters, of which 20% where of location class 1-3 (position accuracy better than 1 km).



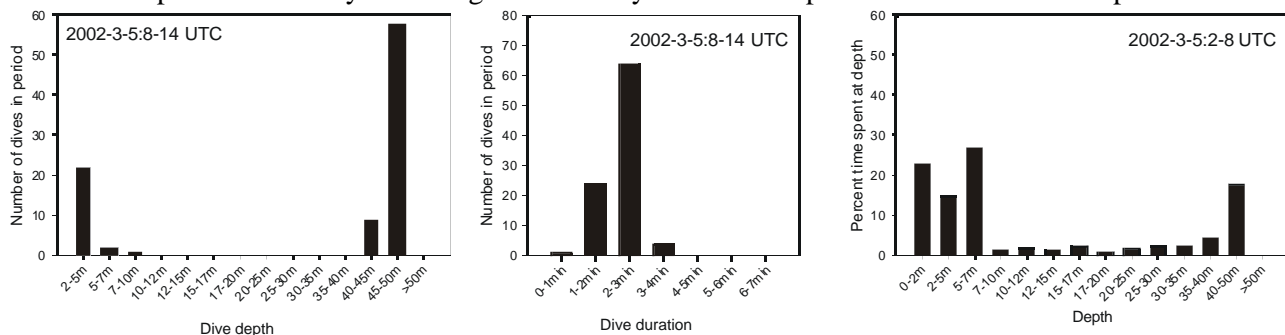
The map shows all positions received until June 1st. This provides an overview of the area visited by the seals. The wind park area is insignificant in size compared to the area used by the seals. The reef as a whole, however, appears to function as an important foraging area (especially the northern side) and also as an important transit area for foraging trips further out in the North sea.

More than 3,000 6-hour histograms were received. This corresponds to 30% of all histograms collected. As there are three types of histograms (dive depth, dive duration and time-at-depth) for each 6-hour period at least one type of dive data is thus available for significantly more than 30% of the deployment time. Below are examples of dive histograms from seal ELSAM04 on a foraging trip in the Southern part of the Norwegian North sea sector. It is observed that the animal performed a large number of dives to between 40 and 50 meters (corresponding with bottom depth in the area). All dives were short, between 1 and 4 minutes. Most of the time is spent close to the surface, but a significant proportion (20%) was spent at the bottom, presumably foraging.



Deviations from original plan

The original plan aimed at deploying all transmitters at the same time. This was not possible because only four seals were caught on January 4th. It was then decided to split the remaining six transmitters into two groups and deploy them at later times so as to extend the period where seals were actively transmitting. This weakens the possibility to draw conclusions about differences in behaviour of the individual seals, as variation now also can be attributed to the changing season and hence different prey distribution. On the other hand it provides information of seal movement and behaviour over an extended period eventually extending into the early construction phase of the wind turbine park.



Activities in the following 6-month period

Since all transmitters have ceased transmitting, the following period will be devoted to the analysis of the very large data material obtained from the transmitters. This analysis will focus on the animals use of the reef area as well as their foraging behaviour in general and correlations with occurrence of selected fish species. Furthermore, a follow-up study will be planned in accordance with the recommendations of the IAPEME.

Fiskeri- og Søfarsmuseet, Esbjerg, den 14.7.2002, Svend Tougaard.