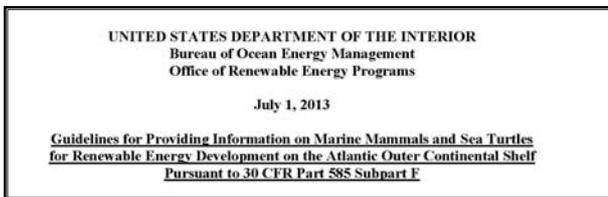


Introduction – New BOEM Guidelines

It is important to establish the current status of marine mammals in an area prior to construction and understand fully the likely impacts during and after development. If not properly planned, Offshore wind farms could adversely affect species and features of ecological importance.

In July 2013, the Bureau of Ocean Energy Management (BOEM) released Guidelines for Providing Information on Marine Mammals and Sea Turtles for Renewable Energy Development on the Atlantic Outer Continental Shelf. The Guidelines offer clarification on BOEM's expectations and the recommendations reflect the lessons learnt over a decade of UK Offshore Wind Farm Developments.



- Key recommendations made by BOEM in their new Guidelines include:
1. The importance of survey planning
 2. Utilisation of qualified experienced Protected Species Observers (PSOs)
 3. *Utilisation of PAM for the establishment of baseline ambient sound and presence of vocalising marine mammals*

The guidelines highlight the need to carefully select the appropriate acoustic equipment for the project based on species of interest and project objectives.

Gardline look at ways to implement these recommendations through an understanding of best available cost effective proven techniques.

Planning Site Characterisation

Planning is the vital first step in providing an accurate site characterisation and the data required will vary on a case by case basis. The following key factors would need to be considered when planning the context of any environmental survey:



- Location and size of the site
- Currently available data
- Species present and of concern
- Establishing a repeatable baseline and approach

These factors will influence the quantity and quality of data required from the surveys and dictate the survey methodology and resources required.

Protected Species Observers (PSO)

In order to obtain quality data during marine mammal and sea turtle surveys, personnel with qualifications and experience in marine mammal identification, survey experience and data analysis should be utilised. In the USA these personnel are known as Protected Species Observers (PSO). Multi-disciplined PSOs offer the advantage of being able to collect additional environmental data such as ornithology and acoustics.



Using Acoustics

Cetaceans (whales, dolphins and porpoise) utilise a variety of sounds underwater to sense environment, find food and to communicate, making them suitable subjects for Passive Acoustic Monitoring (PAM). The excellent acoustic propagation characteristics of water permit the sounds of many cetaceans to be detected at much greater distances than they could be sighted visually. In addition, vocalising cetaceans allows the monitoring of animals during hours of darkness and at times of poor visibility maximising data collection. There are two main types of acoustic recording systems used during marine mammal surveys; mobile and static devices.

Mobile



Mobile recording systems may consist of hydrophones towed behind a ship or attached to another mobile platform, such as a glider, where in each case a large area can be sampled. Typically a towed Passive Acoustic Monitoring System is used during line transect surveys utilising distance sampling methodology.

During the survey a dedicated PAMS Operator is required to monitor for marine mammal vocalisations alongside PSOs offering a cost effective opportunity to combine acoustic and visual surveys. As marine mammals spend the majority of their time underwater, acoustics results in a higher confidence that present animals have been detected. Towed systems are versatile and can be deployed from a range of opportunistic platforms. It is recommended that such survey should be conducted monthly to detect seasonal trends in marine mammal and sea turtle populations.

Gardline have implemented towed PAMS alongside ornithology, marine mammal, geophysical and environmental surveys during site characterisation studies. Marine Mammal vocalisations have provided valuable contribution to population assessments.

Static

With a fixed or static approach, observations can be conducted over longer time periods, collecting data in adverse weather conditions with minimal resources. Such devices include the C-POD or other Autonomous Recording Units (ARUs) which may be deployed for several months at a time and eliminates the impact of vessel bias. This approach negates the need for personnel and vessel costs with the exception of occasional service visits. The same ARUs can also be used to assess baseline underwater noise levels on site.



Gardline have deployed C-PODs at a range of sites during site characterisation for marine renewables to ascertain the baseline population of marine mammals. ARUs are also being used to measure ambient, construction and operational noise levels.

Conclusion

Experience has shown the importance of understanding regulatory requirements and advance planning of the different survey objectives during early stages of site development. The BOEM guidelines are a welcomed addition to the process assisting developers and contractors to ensure this can be achieved while focussing on the most appropriate tools for the job.

Gardline has utilised acoustics during site characterisation of the European wind farm market and understand that such preparation will allow economic use of time and effectively maximizing the potential of the resources in the field to minimise unnecessary delays and additional costs to wind farm development.