

Super High Definition video surveys for birds and cetaceans in offshore windfarm areas around the UK

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Introduction

HiDef have been at the forefront of the development of high definition video aerial survey systems for ornithological and marine mammal surveys since 2007. Improvements to aircraft, camera, mounting and survey design have meant that today HiDef can deliver 1cm ground resolution imagery from super High Definition (HD) cameras mounted on an aircraft flying at 610m at over 220kmh⁻¹. After several trials to prove the technology this survey system is currently being used as the preferred method to undertake cost effective surveys of birds and marine mammals off the UK coast for clients including windfarm developers and statutory regulators.

Data Collection

The methodology used follows best practice as set out in the guidelines for digital aerial surveys (Thaxter & Burton 2009) and has exceeded these through further recent developments. The survey aircraft flies at 610m altitude with a super HD camera mount containing an array of sensors (equivalent to a 100 megapixel stills camera) recording strip transects covering 10% of the marine areas of interest.

Survey imagery is then reviewed for objects of interest and experienced ornithologists at WWT Consulting examine individual sightings which are identified to species level and located to precise geographical positions.

Results

Survey coverage to date has included many of the UK's offshore windfarm development areas including both winter and summer surveys of Dogger Bank (8,552km²), West Isle of Wight (724 km²) and Atlantic Array (950 km²) Round 3 windfarm development zones in the North Sea, English Channel and Bristol Channel, respectively.

Figure 1 shows example screenshots from 2cm resolution aerial survey video footage of sitting and flying birds. The video can be played to observe behaviours and to identify additional traits to aid identification. Figure 2 shows an example bird density map produced from aerial survey video data in the Bristol Channel, UK.

Discussion

HiDef are continually improving the capabilities of their video aerial survey service.

Though the recommended ground resolution of digital surveys for windfarm ecological assessments is 5cm, HiDef is currently using 3cm as a minimum, with 2cm and increasingly 1cm being commissioned for survey activities.

Data collected are being analysed to continually guide improvements to camera configuration and survey design in order to improve mapping of bird and marine mammal species distributions and abundance estimates. This has importance in increasing the power to detect changes in populations associated with windfarm development areas, delivering detailed information at a fraction of the cost associated with traditional boat based survey techniques.

References

Thaxter, C.B. & Burton, N. H. K. 2009. *High definition imagery for surveying seabirds and marine mammals: A review of recent trials and development of protocols*. BTO report commissioned by Cowrie Ltd..

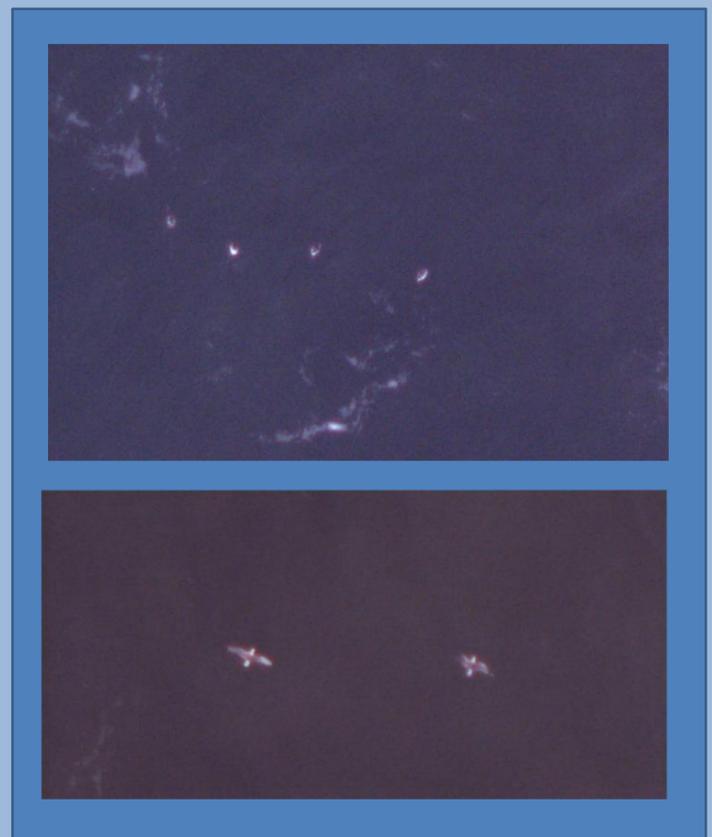


Figure 1. Examples of video images with 2cm resolution: Four auks (above) a Kittiwake (bottom left) and a Common Gull (bottom right).

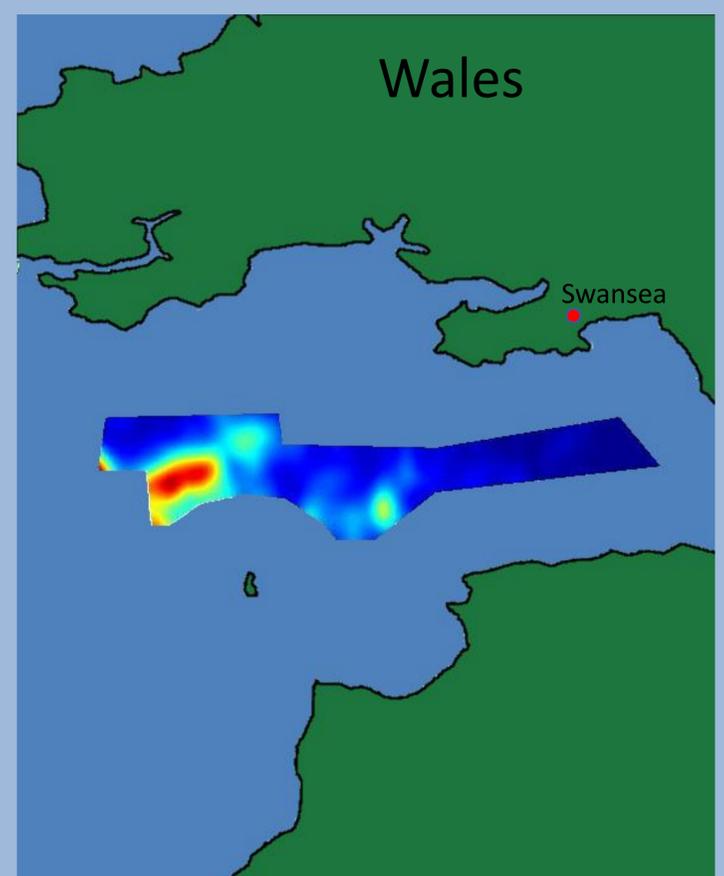


Figure 2. Example of a bird density map produced using HiDef aerial survey video data in the Bristol Channel, UK. Warmer colours indicate higher bird densities.