Challenges associated with Cumulative Impact Assessment and seabird collision risk-modelling for offshore wind farm EIA

*Sinead Petersen of Xodus Group presents the challenges associated with bird collision risk modelling for Cumulative Impact Assessment (CIA).*

Worldwide, wind power generation has been one of the fastest growing industries within the renewable energy sector (Bastos et al., 2015; Wang et al., 2012). Due to the rapid growth in offshore wind in the United Kingdom (UK), there is a growing concern relating to the cumulative impact on the marine environment. One of the main concerns is the cumulative impacts associated with seabird collision risks with wind turbines (Fox et al., 2006; Langston, 2013). The UK is of particular interest as the surrounding coastal waters feature a number of Special Protected Areas (SPAs) which are areas protected under the European Union (EU) Birds Directive (Directive 2009/147/EC; O’Brien and Stroud, 2016).

Some species of seabird are thought to collide and and/or be displaced by offshore wind farm developments (Best and Halpin, 2019). However, species such as Arctic skua Stercorarius parasiticus, Manx shearwater Puffinus puffinus, little auk Alle alle and Atlantic puffin Fratercula arctica for the majority of the time fly near the sea surface and do not fly at turbine height (Johnston et al., 2013). Therefore, to improve the assessment of collision risk modelling some species-specific models are now being produced to better reflect the proportion of the populations potentially at higher risk considering flight height as a factor (Johnston et al., 2013). In addition, migratory pathways towards seabird breeding grounds, overwintering sites, and areas close to SPAs are considered to be higher risk for collision risk.

The majority of collision models involve a calculation of the probability of a collision occurring between a wind turbine and a seabird, assuming no evasive action or behavior has taken place, and a measurement of the number of birds within a “risk window”.

Together, an estimate is made on the number of collisions expected to take place (Masden and Cook, 2016).

Within EU and UK legislation there is a requirement to carry out a Cumulative Impact Assessment (CIA) as part of an Environmental Impact Assessment (EIA). However, a common consensus is that there is a lack of detailed guidance particularly on the assessments (i.e. collision risk modelling) within the EIA process that restricts the ability to show a detailed and ‘true’ picture of the potential impacts of wind turbines on seabird populations. There is a growing concern that CIA is highly constrained by a lack of understanding about the effect wind farms are having on seabirds. Despite the monitoring measures in place, uncertainty remains around the potential impact that the large development of offshore turbines entering the marine environment may have on seabirds (O’Brien and Stroud, 2016).

In the UK, prior to applying for consent to construct an offshore wind farm the developer must monitor the bird densities within their development site to inform their EIA. Data can be collected using a variety of different camera techniques and survey types including aerial, boat and visual surveys. Further monitoring is sometimes necessary for consent to be granted by the regulatory body (O’Brien and Stroud, 2016). However, this process relies heavily on assumptions as mortality from collision is estimated using collision risk models (Band, 2012; O’Brien and Stroud, 2016). This uncertainty has been explicitly recognised for a number of years (Masden, 2015; O’Brien and Stroud, 2016). On top of this issue, the data is often confidential to the project and therefore cannot be used by other developers to inform their CIA. Therefore, CIA is often restricted spatially and temporally, and geographical boundaries are not always specified.
As a potential solution to this issue, Masden et al. (2010) suggested CIA should be the responsibility of the regulatory body rather than the developer. This will remove the confidentiality issue regarding data availability between developments and allow for a more strategic approach with a greater amount of data. Overall this would increase the accuracy of cumulative collision risk modeling. However, changes to data collection methods will still need to be made. Until a standardised method is developed and utilized, CIA will provide the same amount of value as it does presently (Masden et al. 2010).

Collision risk models are a valuable tool for EIA and have the potential to benefit the CIA process greatly if they are adapted to be more strategic. For this to be accomplished in an effective manner, collision risk models will need to be adapted and modified to account for larger scale developments. Data for surrounding developments could also become available to developers and/or as suggested by Masden et al. (2010) if the responsibility for data collection was moved to the relevant regulatory body. The data would not only be available for all developers, but also the methodology used for data collection would be consistent across all projects. This could result in projects becoming more comparable and well as increasing the reliability of the CIA process.

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References


