marinescotland
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Riaghaltas na h-Alba
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A STOCHASTIC COLLISION RISK MODEL FOR SEABIRDS IN FLIGHT

FIGURE 1: WORD CLOUD ANALYSIS RESULTS OF RESPONSES TO SURVEY QUESTION 13

Background

Offshore wind farms in the UK are required to consider potential impacts on seabird populations as part of Environmental Impact Assessments (EIAs) and, frequently, through Habitats Regulations Appraisals (HRAs). To do this, Collision Risk Models (CRM) are used. However, existing CRMs are unable to properly incorporate variation or uncertainty in the input parameters into calculations of collision frequency, or estimate the uncertainty around these values – and uncertainty in predicted collision numbers may result in the delays in the licensing process for offshore wind farms or with proposed windfarms having to be reduced in size or even cancelled.

To address this issue, the Stochastic Collision Risk Model for Seabirds in Flight project was created. Stochastic refers to the element of randomness that is found in natural systems, for example the height at which a bird may fly, or the abundance of birds in a particular location at a particular point in time.

To ensure that the collision model addressed the key issues identified by users of CRMs or those who use their outputs, a number of stakeholders were surveyed. The survey asked about different aspects of the CRM:

- Concept
- User experience
- Inputs
- Operation
- Outputs
- Error checking
- Improvements

Changes

The survey, while taking in to account the scope of the project, resulted in the following changes requested by stakeholders:

- Create a user-friendly interface for non-R users
- Speed up the code
- The number of turbines should be a user input
- Output predicted collision probability data
- Seasonal (as well as monthly & annual) assessment (default + user defined)
- Error checking inputs and collision probability
- Monthly or seasonal flight height inputs

The new stochastic CRM (sCRM) was based on the code written by Masden (2015), but had to be compatible with the Band (2012) offshore CRM. Testing showed that the predictions of the Masden (2015) code matched the predictions of the Band (2012) Excel spreadsheets and consequently, the sCRM was based on an updated, and streamlined, version of the Masden (2015) code.

App

The new sCRM was produced in two forms:

- A Shiny App based on the R-code which is available as an online tool; or
- A Shiny App package download package, which can be run locally in a browser.

The full report and links to the Shiny app can be found at http://www.gov.scot/Topics/marine/marineenergy/mre/current/StochasticCRM

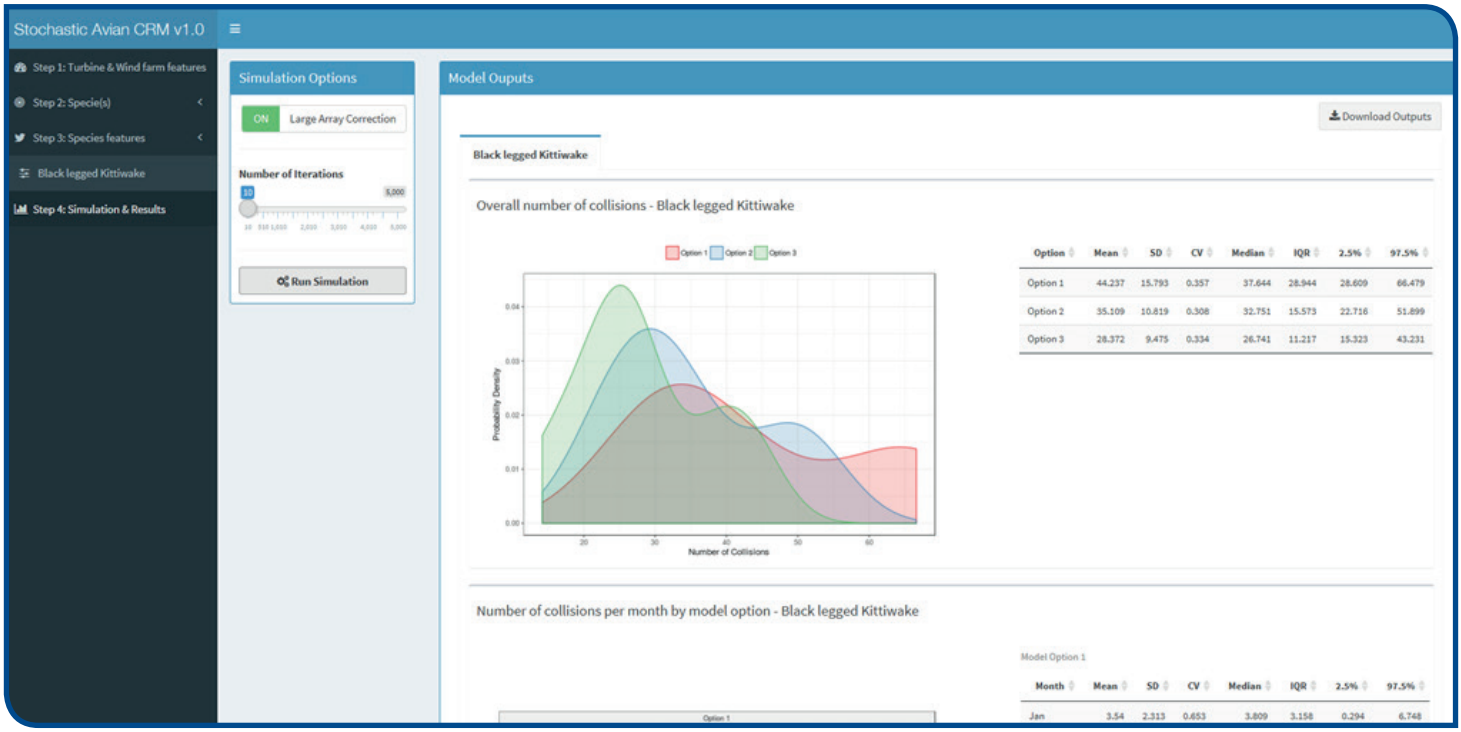

FIGURE 2: THE RESULTS FROM THE sCRM, AS PRESENTED IN THE ONLINE GRAPHICAL USER INTERFACE (GUI). THERE ARE ALSO DOWNLOAD OPTIONS.

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