MODELLING STATISTICS & ANALYSIS

NATURAL POWER'S GEOSPATIAL MODELLING TEAM HELP TO OPTIMISE SURVEY DESIGN, DATA COLLECTION AND DATA ANALYSIS TO INFORM ASSESSMENTS OF THE ECOLOGICAL AND HYDROLOGICAL ENVIRONMENT.

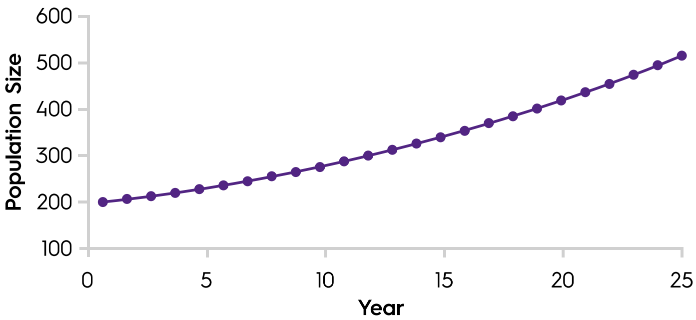
300+ YEARS ENVIRONMENTAL EXPERIENCE

126 ENVIRONMENTAL PROJECTS

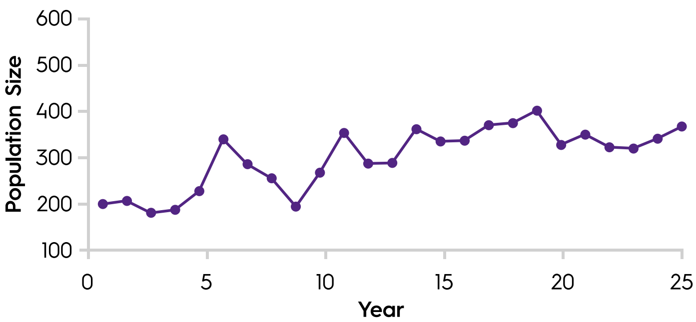
65 ENVIRONMENTAL EXPERTS

2 GEOSPATIAL MODELLERS

DETERMINISTIC POPULATION GROWTH



STOCHASTIC POPULATION GROWTH



Our services include:

- Avian Collision risk modelling
- Bat activity data analysis
- Avian and bat fatality estimation
- Benthic community analysis
- Fish catch analysis
- Species abundance and distribution modelling
- Population modelling
- Peat depth modelling
- Ground water modelling
- Topographic modelling, flow accumulation, topographic wetness and watershed delineation
- Survey design and power analysis
- Application development to allow users to run R code via a user-friendly interface
- Bespoke analytical solutions to get the most out of any dataset

Our expertise includes:

- R programming
- Individual and matrix-based Population viability analysis (PVA)
- Potential biological removal (PBR)
- Spatial data processing using GRASS GIS and QGIS
- Statistical methods for dealing with zero-inflated, auto-correlated data
- Industry standard applications, including iPCoD, MRSea and PRIMER
- Image analysis
- Data simulation
- Application development using RShiny
- Bayesian and Monte Carlo techniques
- Machine learning

// Our experienced team ensure that you get the most out of your data, from generating high quality industry-standard outputs to offering bespoke, innovative and cost-effective data solutions. //

GILLIAN VALLEJO SENIOR GEOSPATIAL MODELLER

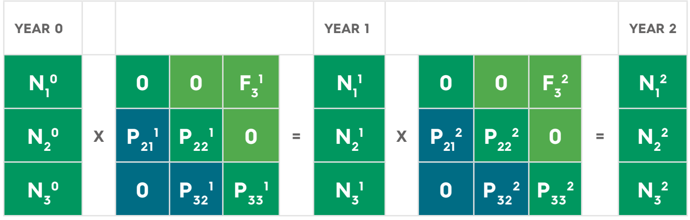
ORNITHOLOGICAL ASSESSMENT FOR HABITAT REGULATIONS ASSESSMENT FOR MORAY FIRTH OFFSHORE WIND DEVELOPMENT, SCOTLAND

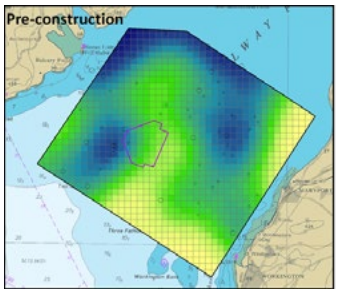
01

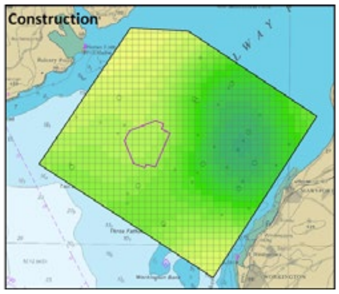
Natural Power used distance sampling and spatial modelling (GLMMs) to predict how many key seabird species were using the proposed development site.

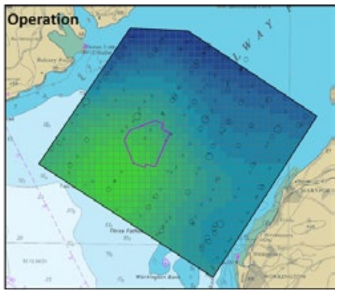
We applied displacement analysis and collision risk modelling (CRM) to measure the likely impacts on these birds. The team also developed bespoke species-specific population viability analyses (PVAs) to assess the likely population-level impacts of these effects. We carried out this assessment in consultation with a range of statutory and non-statutory bodies. We ran sensitivity analyses to assess the relative importance of different input parameters on the PVA model predictions.

We also carried out a power analysis for the site to find out which survey effort would be needed to detect changes in numbers of individuals using the site from operational monitoring data.









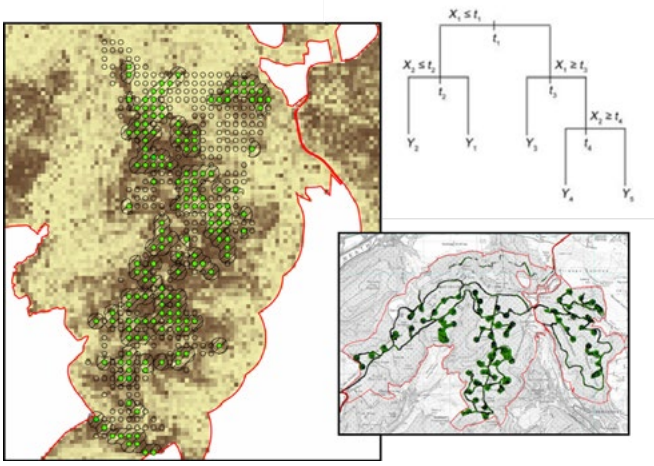
PEAT DEPTH MODELLING AT THE PEN Y CYMOEDD ONSHORE WIND FARM, WALES

02

Natural Power used machine learning techniques to identify and map areas of deep peat. We used these techniques instead of traditional techniques that need thousands of peat probes across a site.

We used preliminary data collected at the site to model the likelihood of deep peat presence across the site. This generated a probability surface that showed areas where model outputs suggested that deep peat was present or absent. It also identified areas of uncertainty that would need further surveys carried out.

This approach reduced costs by reducing the amount of time spent on site. It can be used to increase survey efficiency at large sites.



fionas@naturalpower.com
FIONA STRYJEWSKI
ACCOUNT MANAGER

FOR FULL DETAILS ON OUR **ISO** AND OTHER CERTIFICATIONS, PLEASE VISIT:
naturalpower.com/company

naturalpower.com | **sayhello@naturalpower.com**

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