



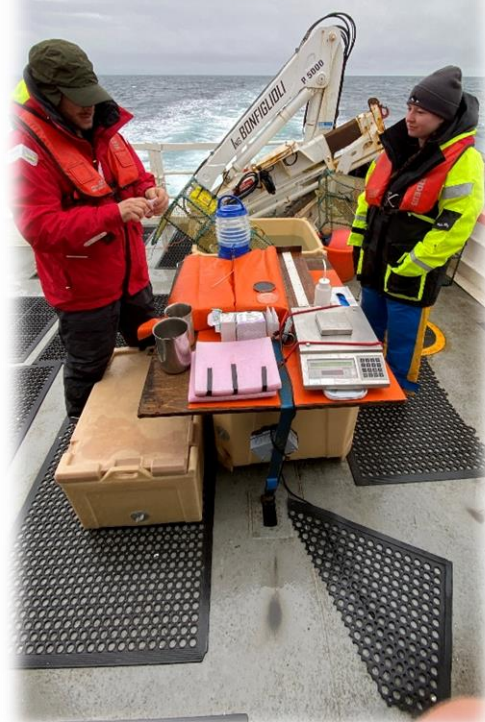
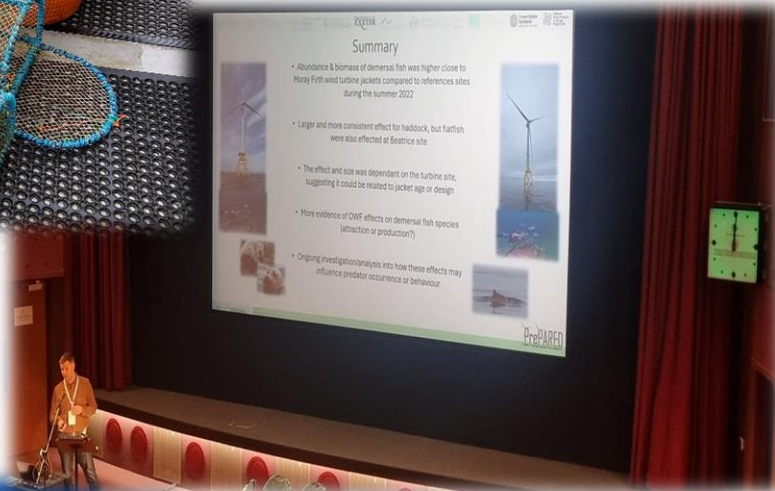
PrePARED
Predators + Prey Around Renewable Energy Developments

Quarterly Report: Q2 2024

Date: 26/06/2024

Project Overview

This quarter has focussed on fieldwork in the Firth of Forth and Moray Firth areas, data processing and analyses, and modelling. Several reports are also being drafted for delivery in Q3.



Summary of activities undertaken in Q2 2024

Task 1.1 Broadscale fish response to OWF in Firth of Forth: Fisheries acoustic/demersal fish survey with seabird at sea survey was planned, discussed, and agreed with developers and currently underway (13 June – 1 July). All RoxAnn data from 2023 surveys have been included in the database and models and predictions were updated (maps produced) and the habitat characteristics (hardness/roughness) were used in the Species Distributions Models.

Task 1.2 Finescale fish response to OWF in Forth: Production of fine scale distributions for NnG and Seagreen OWFs are underway. 2023 laboratory analyses have been completed and broad scale fish surfaces produced.

Task 2.1 Seabird spatial distribution models in Forth: BioSS Senior Spatial Statistician recently joined the team and is working on seabird spatial modelling in the Forth & Tay, environmental and prey data, and transferability. The team are currently conducting a handover. BioSS have continued drafting a paper on how spatial modelling frameworks can be used efficiently with (simulated) tracking and prey data.

Task 2.2 Seabird movement models in Forth: BioSS continuing work on seabird movement models on different scales. The team have also contributed to Task 4.1 by reviewing R code and the draft report on harbour seal foraging in relation to sandeel habitat.

Task 3.1 Large-scale fish distribution in Moray: Fisheries acoustic transect and trawl survey completed in June 2024

Task 3.2: Fine scale fish distribution in Moray – UoE colleagues presented 2022 BRUV results at the EIMR conference, Orkney. A BRUV survey was designed to assess the effects of distance from

turbines and turbine density on fish and this was agreed with OWF, and the BRUV lander tested.

Task 3.3 Fish acoustic telemetry in Moray: Annual fish tagging and array servicing completed in May/June with ~193 fish tagged and 66 out of 80 receivers serviced (4 did not respond and 10 failed to surface meaning they will be retrieved by ROV at a later date).

Task 4.1 Drivers of broadscale marine mammal distribution in Moray: University of Aberdeen (UoA) have shared data and code with BioSS and met to discuss analysis to be undertaken to finalise report in Q3.

Task 4.2 Finescale marine mammal distribution in response to OWF and prey fields in Moray: UoA shared preliminary results combining haddock and flatfish abundances (derived from UoE BRUV data) with harbour porpoise occurrence and foraging activity with University of Exeter (UoE). Additional cross-institution meetings will be organised to discuss further the BRUV-PAM analyses and present the results at the ICES Annual meeting. Further stakeholder engagement is planned for Q3 2024 during this conference. Results were presented at the EIMR conference in Orkney, meeting the target to 'present preliminary results to key stakeholders'.

Task 4.3 Dose response curves in Moray: PAM data has been processed and deterrence functions estimated. Two online stakeholder meetings took place to allow engagement with DEFRA, MMO, MOD and SNCBs.

Task 4.4 Fish nutritional value: Analysis of the Moray Firth and Firth of Forth surveys continued with analyses now largely complete for the PrePARED 2022 samples. The following species having been processed: Mackerel, Viviparous eelpout, Bullrout, Lemon sole, Long rough dab, Flounder, Whiting, Sprat, Common dab, Grey gurnard. Additionally, SMRUc are developing resourcing solutions to support

analysis through 2024-2026 and engaging with PrePARED partners on sampling. Haddock collected around Moray East OWF was recently received and samples from the sandeel surveys are expected to help estimate changes in foodscapes between pre-construction (2019) and post-construction (2024).

Task 5.2 Generalities in marine mammal response to OWF: SMRUc have continued refining the analyses of the effects of array designs on porpoise dose response studies to pile driving using acoustic loggers. They had meetings with the University of St Andrews and UoA teams to present the results and discuss their implications for future studies. SMRUc are delaying the manuscript fractionally to integrate the latest findings from Task 4.3 and supporting those tasks by coming up with transferable rules for analysis in support of dose response functions being generated from PAM data. Preparation of a draft manuscript should be completed in Q4 2024. This work highlights the importance of survey design in using PAM stations for dose-response estimation (and the benefits and challenges of PAM stations at large distances from the source) and ties into Task 6.4.

Task 6.1 Minimum data requirements for seabird distribution and movement models: BioSS are investigating whether the sandeel map (Langton et al) in a way that allows it to be temporally dynamic. BioSS and Wageningen University met to discuss whether BioSS can use ICES yearly stock assessment data (that has uncertainty), combined with uncertainty estimates from the sandeel map, to create maps with some variation/uncertainty with space and time incorporated.

Task 6.3 UK EEZ marine habitats similarity assessment for OWF sites: UoE colleagues have completed ArcGIS modelling and are preparing a final report, which will be delivered in Q3 2024.

Task 7.1 IPcoD and DEPONS integration of new data and testing: Updates to the DEPONS model are being made and work from Tasks

4.3 and 5.1 will feed into this analysis. The updated version of iPCoD (called iPCoD+DEB v1.0) is being finalised currently.

Task 7.2 Adding biological realism to SeabORD and testing: UKCEH have done initial work to re-parameterise the intake rate functions of SeabORD to accommodate alternative prey ranges, such as those estimated in the sandeel suitability maps for the North Sea and those arising from the new empirical sandeel density maps in the Forth-Tay region. The final developments in relation to the incorporation of prey in the model will be delivered under later tasks in 7.2 to be delivered in 2025.

Task 7.4 Integration of PrePARED findings for harbour porpoise CIA: Data collation of wind farm data for UK OWF has continued to support CIA assessments.

Task 8.2: Communications Plan – The Management Group (MG) met to discuss the communications plan and a working document is in place providing guidelines to project management colleagues.

Task 9.2 Dissemination of project findings: Dissemination of PrePARED reports through project website, blog, social media, and email distribution. The Management Group (MG) met to discuss dissemination to ensure a plan is in place for successful uptake of PrePARED outputs. Initial steps are in place to begin targeted engagement with key stakeholders and the MG will meet again to discuss next steps.

Task 9.4 Website and social media: Webpages have been updated to improve accessibility, readability and aesthetics. Webpage analytics in June showed significantly less traffic than in previous months. It is believed that this is due to the SGMD communications team being unable to post on the central social media channels due to general election. Social media postings will return to normal when the election ends.

Summary of activities to be undertaken in Q3 2024

Task 1.1 Broad scale fish response to OWF in Forth - 1) Conduct fisheries acoustic survey/ seabird at sea survey: (June-July); 2) Initiate laboratory work (otolith analyses, RoxAnn analyses); 3) Initiate post processing of acoustic signal and trawl data analyses.

Task 1.2 Fine scale fish response to OWF in Forth - 1) Conduct BRUV/Fish trap surveys in the Firth of Forth; 2) Completion of surveys; 3) Initiate analyses of SBRUV data; 4) Initiate RoxAnn analyses.

Task 2.1 Seabird spatial distribution models in Forth: Applying spatial framework to Forth-Tay prey data with contemporaneous seabird tracking data

Task 2.2 Seabird movement models in Forth: Applying movement models to Forth and Tay prey data collected within project

Task 2.3 Simulating realistic foraging tracks in IBMs: 1) Identify and develop framework for movement model structure and outputs to use in IBMs. 2) Producing behavioural classifications from movement models

Task 3.1 Large-scale fish distribution in Moray: Conduct BRUV and AI camera surveys in Moray Firth

Task 3.2 Fine-scale fish distribution in Moray (reef effects): Conduct BRUV and AI camera surveys in Moray Firth

Task 3.3 Fish acoustic telemetry in Moray: Process acoustic ping data

Task 4.2 Finescale marine mammal distribution in response to OWF and prey fields in Moray: Present preliminary results to key stakeholders at EIMR 2024 conference.

Task 4.1 Drivers of broadscale marine mammal distribution in Moray: Finalise harbour seal report and explore transferability through Task 6.2

Task 4.3 Dose response curves in Moray: Extract data on porpoise occurrence and foraging buzzes and liaise with industry to estimate received noise levels at each PAM location.

Task 4.4 Fish nutritional value: Analysis of PrePARED and Moray East fish samples

Task 5.2 Generalities in marine mammal response to OWF: Final collation of PAM data and covariates

Task 6.1 Minimum data requirements for seabird distribution and movement models: Develop revised version of spatial distribution model that uses only variables that are available throughout North Sea region

Task 6.3 UK EEZ marine habitats similarity assessment for OWF sites: Write and produce final report

Task 7.1 IPCoD and DEPONS integration of new data and testing: Assessment of how integration of PrePARED project outputs into populations models, helps improve models

Task 7.2 Adding biological realism to SeabORD and testing: Initial development of simulated foraging tracks for exemplar species

Task 7.4 Integration of PrePARED findings for harbour porpoise CIA: Engage with Pathways to Growth to ensure further access to CIA parameters from as built windfarms. Due to the re-development of the iPCoD model (Scottish Government funded) which will allow for closer comparison of cumulative impact assessment tools (as the redevelopment involves an energetic engine, as in the DEPONS model), we intend to carry out this work in Q3-Q4 2024 to capitalise on the new version of iPCoD being available. By delaying this work, it also ensures the CIA undertaken is as realistic as possible.

Task 9.1 Annual knowledge exchange workshops: Begin planning for AKEM 2025

Task 9.2 Dissemination of project findings: Support for technical and non-technical dissemination of project findings

Task 9.4 website and social media: Maintain project website and social media comms