East Anglia ONE North and East Anglia TWO Offshore Windfarms

Applicants' Comments on Natural England's Deadline 6 Submissions: Responses to RTD statistical analysis

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Author: Royal HaskoningDHV

Applicable to East Anglia ONE North and East Anglia TWO

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Glossary of Acronyms

AEoI	Adverse Effect on Integrity
AONB	Area of Outstanding Natural Beauty
APP	Application Document
AQMA	Air Quality Management Area
AS	Additional Submission
BLF	Beach Landing facility
CoCP	Code of Construction Practice
CRM	Collision Risk Modelling
DCO	Development Consent Order
DML	Deemed Marine Licence
EIA	Environmental Impact Assessment
EMP	Ecological Management Plan
ES	Environmental Statement
ESC	East Suffolk Council
FFC	Flamborough & Filey Coast
HRA	Habitats Regulation Assessment
IPMP	In-Principle Monitoring Plan
IPSIP	In-Principle Site Integrity Plan
kW	Kilowatt
LCA	Landscape Character Assessment
LCT	Landscape Character Type
LMP	Landscape Management Plan
LVIA	Landscape and Visual Impact Assessment
MMMP	Marine Mammal Mitigation Protocol
MMO	Marine Management Organisation
NE	Natural England
NGET	National Grid Electricity Transmission
NO2	Nitrogen dioxide
NPPF	National Planning Policy Framework
NPS	National Policy Statement
NRMM	Non-Road Mobile Machinery
OLEMS	Outline Landscape and Ecological Management Strategy
OTE	Outer Thames Estuary
OWF	Offshore Windfarm
PD	Procedural Decision
PEIR	Preliminary Environmental Information Report
PMoW	Precautionary Method Statement
PRoW	Public Right of Way
PTS	Permanent Threshold Shift / Permanent Auditory Injury
PVA	Population Viability Analysis
RSPB	Royal Society for the Protection of Birds
RTD	Red-Throated Diver
SAC	Special Area of Conservation
SCC	Suffolk County Council
SCHAONB	Suffolk Coasts and Heaths Area of Outstanding Natural Beauty
SEAS	Suffolk Energy Action Solutions
SIP	Site Integrity Plan
SNS	Southern North Sea
SPA	Special Protected Area
SuDS	Sustainable Drainage System
UXO	Unexploded Ordnance

Glossary of Terminology

Applicant	East Anglia TWO Limited / East Anglia ONE North Limited
Construction operation and maintenance platform	A fixed offshore structure required for construction, operation, and maintenance personnel and activities.
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia ONE North windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
East Anglia TWO project	The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia TWO windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas.
Generation Deemed Marine Licence (DML)	The deemed marine licence in respect of the generation assets set out within Schedule 13 of the draft DCO.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
Inter-array cables	Offshore cables which link the wind turbines to each other and the offshore electrical platforms, these cables will include fibre optic cables.
Jointing bay	Underground structures constructed at intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers within the onshore cable route housing electrical earthing links.
Meteorological mast	An offshore structure which contains metrological instruments used for wind data acquisition.
Mitigation areas	Areas captured within the onshore development area specifically for mitigating expected or anticipated impacts.
Marking buoys	Buoys to delineate spatial features / restrictions within the offshore development area.

Monitoring buoys	Buoys to monitor *in situ* condition within the windfarm, for example wave and metocean conditions.
Natura 2000 site	A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.
Offshore cable corridor	This is the area which will contain the offshore export cables between offshore electrical platforms and landfall.
Offshore development area	The East Anglia TWO / East Anglia ONE North windfarm site and offshore cable corridor (up to Mean High Water Springs).
Offshore electrical infrastructure	The transmission assets required to export generated electricity to shore. This includes inter-array cables from the wind turbines to the offshore electrical platforms, offshore electrical platforms, platform link cables and export cables from the offshore electrical platforms to the landfall.
Offshore electrical platform	A fixed structure located within the windfarm area, containing electrical equipment to aggregate the power from the wind turbines and convert it into a more suitable form for export to shore.
Offshore export cables	The cables which would bring electricity from the offshore electrical platforms to the landfall. These cables will include fibre optic cables.
Offshore infrastructure	All of the offshore infrastructure including wind turbines, platforms, and cables.
Offshore platform	A collective term for the construction, operation and maintenance platform and the offshore electrical platforms.
Platform link cable	Electrical cable which links one or more offshore platforms. These cables will include fibre optic cables.
Safety zones	A marine area declared for the purposes of safety around a renewable energy installation or works / construction area under the Energy Act 2004.
Scour protection	Protective materials to avoid sediment being eroded away from the base of the foundations as a result of the flow of water.
Transition bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.
Transmission DML	The deemed marine licence in respect of the transmission assets set out within Schedule 14 of the draft DCO.

1 Introduction

1. This document presents the Applicants' comments on Natural England's (NE) Appendix A17 (REP6-113). The Applicants previously responded to this in ***Applicants' Comments on Natural England's Deadline 6 Submissions*** (REP7-053) however a number of responses were deferred to Deadline 8 in order that their spatial modeller could provide a response. The spatial modelling was designed and undertaken by Jason Matthiopolous, Professor of Spatial and Population Ecology (Institute of Biodiversity Animal Health & Comparative Medicine) at the University of Glasgow. These are now provided in ***section 2*** below.

2. This document is applicable to both the East Anglia TWO and East Anglia ONE North DCO applications, and therefore is endorsed with the yellow and blue icon used to identify materially identical documentation in accordance with the Examining Authority's procedural decisions on document management of 23rd December 2019 (PD-004). Whilst this document has been submitted to both Examinations, if it is read for one project submission there is no need to read it for the other project submission.

2 Applicants' Comments on NE Appendix A17 (REP6-113) – NE's Comments on Displacement of Red-throated Divers in the Outer Thames Estuary SPA – Update [REP5-025]

Reference	NE Comment	Applicants' Comments
Summary of NE's Position		
1	Natural England raised a number of **fundamental** concerns on the red-throated diver (RTD) Displacement document submitted at Deadline 3 [REP3-049], these are set out in [REP4-087]. We note that the key points raised by Natural England have not been addressed, and the Applicant does not propose to re-visit the modelling to address the issue of the change in survey platform, or to carry out any further validation. **Therefore, we continue to advise that the Applicant should address these outstanding points and that our advice on displacement of SPA divers remains unchanged.**	The Applicants disagree with NE's assertion that 'the key points' have not been addressed and consider that robust responses to the points raised in REP4-087 were provided in REP5-015 and REP5-025. Regarding the modelling, we expand in our responses below on why Nature England's concerns are unjustified and therefore why further analysis is not necessary.
2 – 5	All	Response provided in Applicants' Comments on Natural England's Deadline 6 Submissions (REP7-053). No further comment
Summary of NE's Position on RTD displacement modelling		
5	All	Response provided in Applicants' Comments on Natural England's Deadline 6 Submissions (REP7-053). No further comment
Use of Novel Methodologies		
6	One issue arising within the report is that some of the displacement assessment methods, particularly those	The use of generalised additive models for quantifying spatiotemporal patterns in the abundance of species (including seabirds) is well established in the theoretical

Reference	NE Comment	Applicants' Comments
	around the buffer zone analysis and generation of the counterfactuals, are novel as far as Natural England is aware (i.e. not in the published literature). Therefore, the onus is on the Applicant to clearly demonstrate that the buffer zone and counterfactual methodologies are scientifically robust. These would require further sensitivity analyses or references to past work / precedence (as well as addressing other methodological concerns) before Natural England would accept the outputs of the modelling.	and applied literature. The literature track record includes (conservatively) 350 peer-reviewed publications on the topic. Most of these have an applied focus on conservation and management. A small selection of examples includes (Clarke et al. 2003, Olivier and Wotherspoon 2006, Meynard and Quinn 2007, Augustin et al. 2013, Renner et al. 2013, Russell et al. 2016, Fifield et al. 2017, Heinanen et al. 2017, Garcia-Baron et al. 2019, Gonzalez et al. 2020, Tepsich et al. 2020, Clavel-Henry et al. 2020). Regarding the counterfactual methodologies, there is nothing novel about removing a covariate (in this case, the windfarms) from a statistical model as a way of quantifying its impact on the predictions (Travers et al. 2019).
ANNEX 1. Detailed technical comments on [REP5-025] Displacement of Red-Throated Divers in the Outer Thames Estuary SPA - Update		
7 - 10	All	Response provided in Applicants' Comments on Natural England's Deadline 6 Submissions (REP7-053). No further comment
11 & 12	3) Counterfactual approach and potential pseudo-replication The Applicant has endeavoured to address some of Natural England's concerns regarding the counterfactual approach and the potential for pseudo-replication as set out in [REP4-087], but unfortunately these remain outstanding issues. Natural England's view continues to be that the counterfactual comparison is producing lower relative changes in abundance when compared to other studies. In all likelihood this is due to the distance to windfarm relationship (Figure 4 Appendix 1) being weak when compared to other parameters. It is therefore	The Applicant notes that NE has referred to the windfarm effect as a 'weak' one when compared with those estimated for the other covariates, and would agree that this is the case, with bathymetry and distance to coast having a much greater influence on the red-throated diver distribution than windfarms. This is to be expected for several reasons, not least the fact that these variables are present throughout the study area, while the windfarm effect is necessarily much more localised. Furthermore, if a weak predictor of the species distribution (windfarms)is removed then the differences will be comparatively small. None of this is surprising. Moreover, it all supports the Applicants' position that the effect of windfarms on this species is not as great as NE propose. Due to their nonlinear nature, generalised additive models (GAMs) are not affected by collinearity. Hence, the standard tests (such as Variance Inflation Factors) that may be implied by NE's response, are not applicable here. Arguably,

Reference	NE Comment	Applicants' Comments
	expected that by removing the weak relationship, only a weak relative change in abundance would be detected. The Applicant states that they have considered this matter further by reviewing the partial plots of the time specific spatial layers (Figure 4 in Appendix 1) and found no similarity between the fitted spatial effects and the location of windfarms, and therefore assert that pseudo-replication is not an issue. However, the results of this review have not been shown in the report and therefore we are unable to agree with the Applicant's position. Furthermore, we would have expected to see a check of collinearity of the covariates, and reporting of that process, in order to get a better understanding of the appropriateness of the variables. Provision of this information would allow the robustness of the Applicant's modelling to be better assessed, and should be submitted into the Examination.	there could be issues of concurvity, however these are often betrayed by volatile behaviour in the predictions of the model, which have not been observed here.
13	4) Limitations of the Modelling Approach Natural England has commented, on several occasions, that the results showing only ~33% of birds being displaced from the windfarms is much lower than other studies. This is related to the fact that other studies use methods like MRSea or Bayesian point process models, both of which have more sophisticated methods of dealing with the spatial structure in the data. For example, Bayesian point process models have a similar spatial component as an intrinsic stochastic process, while a Generalised Additive Modelling (GAMs) approach, as used by the Applicant, incorporates the spatial structure as a	Regarding the comparison with MRSea: The MRSea package mentioned by NE, although in our opinion technically excellent, follows a similar treatment to ours (i.e. spatial smooths as fixed effects). Arguably, CRESS, on which it is based, has a considerably shorter pedigree than MGCV (the GAM implementation used by the Applicant). Regarding the comparison with Integrated Nested Laplace Approximations (INLA): For a number of computational reasons, INLA is the method of choice for difficult spatiotemporal models. However, it is worth noting that it is still an approximate approach, in contrast to GAMs as implemented in MGCV by the Applicant. To describe any effects as a function of distance from a feature (e.g. windfarm), both

Reference	NE Comment	Applicants’ Comments
	deterministic smooth function. Paradinas et al. (2017) outlines more explicitly why a stochastic approach is better for quantifying spatial relationships. A more sophisticated approach for capturing the spatial structure in the predictions might be more appropriate.	our approach, and previous INLA-based approaches would need to use a smoothed, fixed effect of distance. It is true that INLA uses sophisticated spatially structured random effects to capture unexplained variation in the data, but these have their practical analogue in the spatiotemporal smooths we used in MGCV (in addition to a smoothed function of distance from windfarms) to capture residual variation. There are further geometric parallels between the methods. The level of flexibility in these residual terms is determined by the knot placement (in MGCV and CRESS) and the polygon placement in (SPDE and INLA). The Paradinas et al. (2017) reference cited by NE is an excellent showcase of spatial random effects in INLA, but presents no comparison between the two approaches discussed here. Due to its flexibility, long-track record in the peer reviewed literature and exact (albeit time consuming) numerical implementation, we still argue that the GAM approach is an equivalent, if not superior, practical solution here.
14	In paragraph 13 of the Applicant’s report it states that their modelling is similar to that used in the studies in the German Bight. However, this statement is not true. The only similarities are that the data were collected by aerial surveys and some of the same environmental parameters are included in the modelling. However, the GAM approach used by the Applicant and Bayesian methods used in the German Bight study are very different. It is possible that the spatial smoother that the Applicant has used is not as sophisticated as the one applied with MRSea by London Array (APEM 2020), or with Bayesian point process models used in the German Bight (Vilela et al, 2020), and so the predictions are being driven almost entirely by bathymetry and distance to coast. It seems entirely possible that GAMs are over-generalizing the	There is an evident misunderstanding of our approach, but also of previous approaches by NE in this comment. We did not merely use fixed effects of distance and bathymetry in the models, we also captured residual spatiotemporal variation in spatial smooths. As argued above, these are functionally equivalent (although not mathematically the same) to spatial random effects, as used by INLA. There are also two unsubstantiated assumptions in the comment. First, the assumed superiority of MRSea is not backed by track record (hundreds of published spatiotemporal applications of MGCV, as opposed to a handful of CRESS). Second, the assumption that a method is superior purely by virtue of being Bayesian is simplistic. The strength of Bayesian methods is in the specification of informative priors for their model parameters. Very few applications of INLA

Reference	NE Comment	Applicants' Comments
	relationship compared to other methods that were used in other studies and as such, they under-estimating the percentage decline in RTD abundance. Natural England notes that the only way to test that would be to apply the same Bayesian point process models as Vilela et al. (2020).	modify the default priors. We are certainly not aware that Vilela et al. 2020 customised the priors to expert opinion or independent data, specific to the system modelled. Furthermore, if a Bayesian methodology is considered a prerequisite for these analyses, it should be noted that uncertainty estimation in MGCV now follows the Bayesian paradigm. The NE responses give the impression that more recently introduced methods should be used in preference to more established ones, whether these are being kept current, or not.
15	The Applicant acknowledges that it is possible that if there are indirect effects of the windfarms on red-throated diver distributions which do not radiate symmetrically from the wind farms, these would not be captured by the structure of the distance-to-wind-farm layer and may instead be incorporated into the spatial term. Natural England notes that the same possibility must therefore also exist when considering direct effects of windfarms on the birds which likewise do not necessarily radiate symmetrically from them. This introduces a further source of uncertainty regarding the modelled outputs which a more sophisticated modelling approach might have addressed. This emphasises the need for validation of the model's outputs (see below).	We stand by the caveat provided in our original report. A fixed-effect term that is included in the model to capture symmetric effects of distance, will not be able to capture asymmetric effects of distance. It is not of any relevance whether these effects are direct or indirect, although we found it hard to imagine how direct effects of avoidance would be asymmetric without the intervention of another unknown variable, such as asymmetric wind fields. It is also true that any such asymmetries will be captured by the model's spatial smooth. However, this is neither a source of uncertainty (since the model captures the asymmetries), nor unique to our approach. The alternative frameworks of MRSea and INLA proposed by NE, would do exactly the same by capturing residual asymmetries in spatial smooths (MRSea) or latent spatial fields (INLA and SPDE).
16 & 17	5) Validation of model predictions It is disappointing that the Applicant has again not provided the necessary validation of the model outputs through comparisons of the model predictions with survey results recorded in and around windfarms, and through	Having clarified (above) that NE does not appear to be suggesting the use of cross-validation for model fitting, or model selection, but rather model evaluation, it is unclear to the Applicants why the bootstrapping approach already presented was deemed inadequate as a resampling evaluation of uncertainty in our results.

Reference	NE Comment	Applicants' Comments
	formal cross-validation, as advised by Natural England at deadline 4 [REP4-087]. We advise that cross-validation is defined as a method of evaluating and comparing learning algorithms by splitting data into 'training' and 'validation' datasets and is commonly applied in spatial modelling exercises. It can be used for model selection, but for it to be applied appropriately, the cross-validation 'folds' need to be independent. In this instance the Applicant has separated cross-validation and independent validation when they are the same procedure, which NE advises is inappropriate (Refaeilzadeh et al. 2009; Arlot and Celisse 2010).	
18	Natural England disagrees with the Applicant that by using their chosen statistical software, which they assert replaces impractical methods with considerably more expedient ones such as maximum likelihood (in the case of model fitting) and penalised likelihood criteria such as the Akaike Information Criterion (AIC) (for model selection), our concerns are addressed. Our concerns remain outstanding. We advise that the cross-validation methods have not been replaced and are far from impractical, particularly with new R packages being rapidly developed. For example, in Allen and Kim (2020) a spatial blocking system is used for cross validation. Another recent example from Clairbaux et al. (2020) demonstrates cross validation for a large spatial data set using 80/20 data splits. The spatial blocking technique would be particularly relevant here as it could demonstrate which areas of spatial distribution are being predicted better than	This comment mainly debates a point of confusion about whether the suggestion of cross-validation was made for model-fitting, model-selection or model evaluation. The Applicants maintain that cross validation is not practical for the first two objectives (and make this point from a position of considerable experience in such matters), and that with respect to the third point, the Applicants have presented sufficient evidence of model performance and uncertainty in terms of resampling methods. Regarding the final point, on spatially-explicit uncertainty, our GAM results have quantified that and it is unclear how further discussion on this issue would resolve this matter since NE has focused interpretation on a single-value result (the average distance of impact), with little attention on the issues of spatial heterogeneity and prediction uncertainty.

Reference	NE Comment	Applicants' Comments
	others, and clarify the performance of the model and therefore the weight that can be given to its outputs.	
19	We note that the Applicant is correct in a broad sense that there is a level of subjectivity in assessing what is a 'good' or 'bad' model, as it depends on the data. However, a blocked cross-validation could display data relatively and spatially and would allow for an assessment of the spatial areas which have the most relatively robust predictions. We recommend that the Applicant considers the use of a blocked cross-validation to increase the level of confidence in the model.	In principle, it is preferrable to quantify uncertainty for readers to see (as the Applicants have done in the bootstrapping results), rather than use an arbitrary 'good vs. bad' value judgement, which would be open to more criticism. With respect to the more nuanced points on spatial variations in uncertainty, see the response to point 18.
20 & 21	We note that the Applicant is of the view that for the current models and size of dataset the time-scale for cross validation analysis could be in the order of years. However, we request that further clarity is provided on what is meant by this e.g. does the Applicant mean it would take years to analyse or more years of data to perform? Arguably neither of those would be true, as cross-validation is a well-documented procedure with packages available in R to carry this out. Regarding data quantity, it is true that temporally there is a limited data set available; however, spatially and numerically there are sufficient data to generate a model, thus it would be possible to do a cross-validation assessment, even with the caveat that temporally there are limitations. **Therefore, for the reasons set out above we continue to advise that some form of validation be carried out by the Applicant in order to demonstrate that the**	Small-fold cross-validations for model-fitting and selection are expensive (computationally). But it is apparent to the Applicants through review of their comments that this is not what is being sought by NE. Regarding cross-validation, for model evaluation, see the responses to points 18 and 19.

Reference	NE Comment	Applicants' Comments
	modelling is robust and suitable for use in assessing displacement impacts.	
22	6) Model assumptions and model selection Whilst the Applicant's view is that there can be confidence in the selected best fit model, which is defined by the use of penalised AIC, which is appropriate for GAMs; Natural England notes that no model assumptions have been provided to ensure that GAMs have been applied appropriately. For example, this could have involved plotting the standardized residuals against fitted values to examine issues with mean-variance, or checking the residuals for violation of independence using correlograms/variograms. The output from the GAM check in R would also help to ensure that the degrees of freedom chosen by the algorithm were appropriate as well.	Residual checks would not be appropriate, given that the modelling used flexible spatial smooths to capture residual autocorrelation. The flexibility of the model means that residuals are by minimised by the process and would provide very limited inference.
23	The Applicants also do not present any sort of check of correlation between variables by way of the variable inflation factor or similar assessments. This relates to the counterfactuals as well in that an assessment of cross-correlation between variables could help identify if the signals are being confounded. <u>These matters require further consideration in order to demonstrate the model assumptions and selection are robust.</u>	Please see the responses to comments 11 & 12, above.
24 - 27	All	Response provided in Applicants' Comments on Natural England's Deadline 6 Submissions (REP7-053). No further comment

3 References

Augustin, N. H., V. M. Trenkel, S. N. Wood, and P. Lorance. 2013. Space-time modelling of blue ling for fisheries stock management. Environmetrics 24:109–119.

Clarke, E. D., L. B. Spear, M. L. McCracken, F. F. C. Marques, D. L. Borchers, S. T. Buckland, and D. G. Ainley. 2003. Validating the use of generalized additive models and at-sea surveys to estimate size and temporal trends of seabird populations. Journal of Applied Ecology 40:278–292.

Clavel-Henry, M., C. Piroddi, F. Quattrocchi, D. Macias, and V. Christensen. 2020. Spatial Distribution and Abundance of Mesopelagic Fish Biomass in the Mediterranean Sea. FRONTIERS IN MARINE SCIENCE 7.

Fifield, D. A., A. Hedd, S. Avery-Gomm, G. J. Robertson, C. Gjerdrum, and L. M. Tranquilla. 2017. Employing Predictive Spatial Models to Inform Conservation Planning for Seabirds in the Labrador Sea. FRONTIERS IN MARINE SCIENCE 4.

Garcia-Baron, I., M. Authier, A. Caballero, J. A. Vazquez, M. Begona Santos, J. Luis Murcia, and M. Louzao. 2019. Modelling the spatial abundance of a migratory predator: A call for transboundary marine protected areas. DIVERSITY AND DISTRIBUTIONS 25:346–360.

Gonzalez, C. E., J. Medellin-Mora, and R. Escribano. 2020. Environmental Gradients and Spatial Patterns of Calanoid Copepods in the Southeast Pacific. FRONTIERS IN ECOLOGY AND EVOLUTION 8.

Heinanen, S., R. Zydelis, M. Dorsch, G. Nehls, and H. Skov. 2017. High-resolution sea duck distribution modeling: Relating aerial and ship survey data to food resources, anthropogenic pressures, and topographic variables. CONDOR 119:175–190.

Meynard, C. N., and J. F. Quinn. 2007. Predicting species distributions: a critical comparison of the most common statistical models using artificial species. JOURNAL OF BIOGEOGRAPHY 34:1455–1469.

Olivier, F., and S. J. Wotherspoon. 2006. Distribution and abundance of Wilson's storm petrels Oceanites oceanicus at two locations in East Antarctica: testing habitat selection models. POLAR BIOLOGY 29:878–892.

Renner, M., J. K. Parrish, J. F. Piatt, K. J. Kuletz, A. E. Edwards, and G. L. Hunt Jr. 2013. Modeled distribution and abundance of a pelagic seabird reveal trends in relation to fisheries. MARINE ECOLOGY PROGRESS SERIES 484:259–277.

Russell, D. J. F. J. F., G. D. D. Hastie, D. Thompson, V. M. M. Janik, P. S. S. Hammond, L. A. S. A. S. Scott-Hayward, J. Matthiopoulos, E. L. L. Jones, and B. J. J. McConnell. 2016. Avoidance of wind farms by harbour seals is limited to pile driving activities. Journal of Applied Ecology 53.

Tepsich, P., I. Schettino, F. Atzori, M. Azzolin, I. Campana, L. Carosso, S. Cominelli, R. Crosti, L. David, N. Di-Meglio, F. Frau, M. Gregorietti, V. Mazzucato, C. Monaco, A. Moulins, M. Paraboschi, G. Pellegrino, M. Rosso, M. Roul, S. Saintignan, and A. Arcangeli. 2020. Trends in summer presence of fin whales in the Western Mediterranean Sea Region: new insights from along-term monitoring program. PEERJ 8.

Travers, H., M. Selinske, A. Nuno, A. Serban, F. Mancini, T. Barychka, E. Bush, R. A. Rasolofoson, J. E. M. Watson, and E. J. Milner-Gulland. 2019. A manifesto for predictive conservation. Biological Conservation 237:12–18.