nature's voice

RSPB SCOTLAND

David O'Sullivan
Marine Scotland – Renewables Licensing Operations Team
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14th November 2012

Dear Mr O'Sullivan,

Moray Offshore Renewables Limited application for Marine Licenses & Section 36 Consent

RSPB Scotland welcomes the opportunity to comment on the proposed construction and operation of the Telford, Stevenson and McColl offshore wind farms and associated transmission infrastructure to be located in the Outer Moray Firth, some 22km east of the Caithness coastline.

MORL has sought to engage with and respond to statutory and non-statutory stakeholders throughout the process of environmental assessment and RSPB Scotland take this opportunity to support this positive and constructive approach. The Society believes that as a direct result, the supporting environmental assessment is comprehensive, detailed and well presented.

Notwithstanding the comments above, RSPB Scotland has identified technical issues in the environmental assessment that require further consideration. RSPB Scotland **objects** to the proposals, as currently presented within the application, on the basis that the environmental assessment underestimates risk and potential environmental impacts as:

1. Recent demographic trends of at-risk bird species are not adequately considered.
2. The cumulative impact assessment is incomplete and does not follow best practice.

Our objection is precautionary and in this regard we would welcome further engagement with MORL and statutory authorities to provide advice and input to the assessment of ornithological interests. Further detail to our objection is presented in Annex 1.

Yours sincerely,

[redacted]

Charles Nathan
Conservation Planner (Marine)

Cc'd Catarina Rei – Moray Offshore Renewables Ltd
Sophie Allen – Joint Nature Conservation Committee
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BirdLife INTERNATIONAL

ANNEX 1 – MORL Offshore Wind Farm Applications: RSPB Scotland Consultation Response (November 2012)

Background

MORL were awarded a Zone Development Agreement by The Crown Estate in January 2010. The Zone lies on the Smith Bank in the outer Moray Firth approximately 22km from the Caithness coastline and covering some 520km^2. MORL has made an application for construction and operation of three offshore wind farms named Telford, Stevenson and McColl to be located within the eastern development area of this Zone.

All three wind farms combined equate to an energy capacity of 1,500MW and up to 339 wind turbines (i.e. 139 turbines in the first site to be developed and 100 turbines in the subsequent two sites). The transmission infrastructure proposes to connect the turbines to the National Grid via an onshore connection at Peterhead Power Station. The export cable route extends to some 135km. The proposed projects lie adjacent to the Beatrice offshore wind farm for which an application was submitted to Marine Scotland in spring 2012.

Key Concerns

RSPB Scotland considers that the environmental assessment underestimates risk and potential environmental impacts of the proposed developments - Telford, Stevenson and MacColl offshore wind farms and associated infrastructure.

1. Recent demographic trends of at-risk bird species are not adequately considered. This is particularly significant given marked changes in bird species over the past decade. Without consideration and factoring in of these changes in the population viability analyses, the assessment may not identify potentially significant environmental impacts to a number of at-risk bird species.
2. The cumulative impact assessment is incomplete and does not follow best practice. The assessment uses inappropriate avoidance rates for species considered within the collision risk model. Less precautionary avoidance rates are used than are advised in SNH and JNCC guidance and we are not reassured by the justification provided for use of these alternative rates. In addition the CIA does not assess other commercial scale offshore renewable developments, including those in the Pentland Firth and Orkney Waters. It is cited that this is due to a lack of data, however, some of these significant developments are already lodged in the planning system and both regional and site specific data is available for inclusion in a CIA.

Population Viability Analysis

- The Population Viability Analyses (PVA) carried out for gannet, fulmar, kittiwake, herring gull, great black-backed gull, guillemot, razorbill and puffin have been carried out in a thorough manner. However the demographic parameters used as inputs, while derived from the most recent scientific papers, do not take into account recent demographic changes. In some cases these changes relate not to current population figures but to the level of productivity. As a consequence the PVAs underestimate risk and if re-run using recent trend data, conclusions of both the EIA and HRA may be different and potentially of greater environmental significance and/ or impact.

- Data are available on such recent changes, for example via the JNCC Seabird Monitoring Program, or from RSPB reserve monitoring. RSPB Scotland is open to providing publically available data that could be used to update the parameters of the PVA to better incorporate recent demographic trends.

Displacement & Barrier Effects

- Some high displacement percentages are given but are concluded to be of no environmental significance. For instance the study concludes that 13.5% of razorbill North Caithness Cliffs SPA population will be displaced and that this is not significant.
- The ES does not seem to take full account of the assessment of barrier effects on auks.
- In both cases we consider that increased foraging effort in combination with other ecological pressures (including lower sandeel abundance) would result in these effects being of greater significance. As already noted, the PVA must take account of recent demographic changes in this instance.

Collision Risk Assessment

- The collision risk assessments are based on 72 x 7MW turbines in each of sites 2 and 3. In Chapter 7, Section 7.4.3 this is described as the worst-case scenario but without justification. In the cumulative impact assessment, the worst-case scenario for the Western Development Area is the alternative, 100 x 5MW combination. We seek fuller explanation on how worst-case turbine combinations have been determined.

Cumulative Impact Assessment

- Collision mortality rate estimates are input into the cumulative impact assessment, which considers the MORL and neighbouring BOWL wind farm proposals. The mortality estimates are based upon higher avoidance rates than those recommended in statutory guidance. In calculating the potential number of collisions, SNH and JNCC guidance stipulates the use of 98% avoidance rates for those species considered in the CIA. In this case, the use of higher rates greatly reduces the number of predicted collisions and subsequently underestimates potential risks.
- Furthermore, assessment of collision risk for the project in isolation (Chapter 7, Section 7.4.7.7) presents estimates using the 98% avoidance rate. For consistency, the 98% rate should be presented both for the project in isolation and for the CIA.
- Within the ES, justification is given for using less precautionary avoidance rates for species such as gannet. However, behavioural data taken from studies of species located in distinctly different geographic locations and environmental or ecological contexts may not be applicable to the Outer Moray Firth. We are aware that, with time, regionally specific empirical data on the behaviour of seabirds and their interactions with offshore wind farms will become available through extensive monitoring and research studies. However, in this case, we do not consider the use of less precautionary avoidance rates is warranted by the justification and data provided.

- The use of different rates also raises a strategic issue, whereby MORL's CIA inputs and conclusions do not align with BOWL's assessment. Marine Scotland, as the licensing authority, must be presented with the best available information to inform their decisions and these clear discrepancies need resolving, ideally through collaboration and agreement between all parties.
- We welcome the approach taken to consider the Western Development Area (WDA) in the assessment. However, again, incorrect avoidance rates have been used and given they are less precautionary, there is an underestimation of risk.
- Tidal and wave projects coming forward and located within the Pentland Firth & Orkney Waters are not included in CIA. Given the proximity of these foreseeable commercial scale developments (with MeyGen's application submitted in summer 2012) and the connectivity of species between and beyond the Moray Firth and PFOW, it is considered imperative that, where suitable data exists, these marine renewable proposals are taken into account in this CIA. The species likely to be affected by both Moray Firth and PFOW developments are fulmar, gannet, guillemot, razorbill & puffin.
- RSPB Scotland requests to be consulted on a suitably precautionary re assessment using the recommended avoidance rate of 98% and inclusion of foreseeable developments located within the PFOW.
- We think it is likely that in combination, the proposals will have significant potential cumulative effects under the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000 (as amended) and could adversely affect the integrity of sites designated as part of the Natura network under the Conservation (Natural Habitats & c) Regulations 1994 (as amended). Marine Scotland, if minded to grant an application, has a duty to identify a route forward that achieves avoidance and/ or a reduction in environmental impacts in order that future consents may comply with national and international environmental legislation.
- RSPB Scotland recommends that MORL and BOWL proposals are determined in unison. Each proposal should be assessed for its acceptability, both alone and in terms of cumulative impacts, based on the most complete information available at the time of determination. Joint determination would enable a coordinated cumulative impact assessment by Marine Scotland of both proposals using appropriate and agreed inputs. In addition, this approach supports national renewable policy by enabling projects that deliver greatest energy output for least environmental impact.

Population Estimates

- Recent population trends have been acknowledged in the baseline information. However, as discussed above, these trends are not factored into the PVA. This underestimates the assessment of potential environmental impacts and has consequential influences on the conclusions made on individual species impacts, the CIA and the HRA.

Information to Inform the Habitats Risk Appraisal

- The assessment, through flight direction analysis, attempts to apportion birds present on site to each SPA (Section 3.1.5). We acknowledge the aims and efficacy of this approach for apportioning certain species, but do not consider that it should be applied as a method of apportioning all species. We would recommend this approach is revised following further consultation with ourselves and statutory authorities SNH and JNCC.

- We have requested amendments and a subsequent update to the PVAs. Given that these analyses provide the basis for the HRA, we must await the updated findings before providing detailed comment on the HRA elements of the assessment.

Species Accounts

- **Gannets:** noted as of moderate risk to windfarms in Langston 2010 but in the ES conclusion it is stated that they are of low risk. Table 7.4.11 presents collision risk estimates using a 99.5% avoidance rate which equates to 57 collision mortalities per annum. The justification for this, in the technical appendix, is based on studies at Egmond aan Zee in the Netherlands. In terms of both timing of observations and the location of this development it is unlikely that the records were of breeding gannets, and therefore their behaviour and consequent collision risk is likely to be quite different to those in the Moray Firth. All other species in this table are presented with a 98% avoidance rate, as recommended in statutory guidance from SNH and JNCC. 98% avoidance rate estimates should be presented in the assessment for gannet, which equates to 227 collision mortalities per annum. Not including this in the assessment underestimates the potential risks to this species. See also comments under CIA for our view on the use of less precautionary avoidance rates.

Other Issues

- The cabling route from the offshore sites to the landing at Peterhead crosses through the proposed southern Moray Firth search area for a Marine Protected Area. The proposed MPA search features include minke whale, white beaked dolphin and seabed habitats and this area is also important foraging habitat for other mobile marine species. The assessment should consider the relevance of potential impacts to this proposed MPA at the project design, pre-construction and construction phases to ensure adequate mitigation and management.
- We note the justification presented for the limited consideration of migratory species including geese and passerines flying across the site, however, we consider there to be too few data to make firm conclusions of no significant impacts. In this regard, suitable monitoring of any consented development must include monitoring during night time and adverse weather conditions.
- Should the proposed developments be consented, RSPB Scotland request to be consulted on the preparation of the Site Environmental Management Plan and the Construction Management Plans.
- Similarly, we wish to be consulted on the preparation of the Monitoring Plan. This is of particular importance given the need to evidence the accuracy of model outputs used in the environmental assessment; to elucidate existing knowledge gaps; and to inform future development. In this regard the monitoring plan must be rigorous and robust. Suitable methods should include the use of remote sensing technologies such as radar, cameras, device- or bird- mounted cameras, telemetry, satellite/ GPS and data loggers.
- It is acknowledged that there could be potential significant impacts on marine mammals and that further information will be required to establish acceptability of the development in this regard.

RSPB Scotland

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23rd July 2013

Dear Mr O'Sullivan,

Moray Offshore Renewables Limited application for Marine Licenses & Section 36 Consent – Additional Information

RSPB Scotland welcomes the opportunity to provide further comment on the application for the Telford, Stevenson and MacColl Offshore Wind Farms, situated in the outer Moray Firth. The applicant, Moray Offshore Renewables Ltd (MORL), has provided further information in support of their proposals. Ahead of this submission, MORL met with RSPB Scotland to give a project update and we appreciate these efforts to keep stakeholders informed of the project's progress.

The submission presents additional information in response to requests made by the statutory agencies (including SNH, JNCC and MSS) and relates to the environmental assessment of impacts on ornithology. Ornithological interests, in particular, have been the focus of intense study and consultation, with input from all stakeholders at the project level and progress has been made. However, consideration of offshore wind impacts on birds is set within a wider Scottish and UK context, with some issues still to be addressed by the Scottish Government and its statutory advisors and which are beyond the control of MORL. Despite progress, RSPB Scotland is not yet satisfied or confident in the advanced methods of assessment, nor do we believe it wise to make our appraisal ahead of the publication of seabird population data and research packages that are of direct relevance to the application. These include:

- **Displacement:** publication of Marine Scotland commissioned research into the effects of displacement on seabirds is forthcoming, which will better inform the accuracy of the assessment and its conclusions.

- **Colony counts:** results of an SNH-led colony count of East Caithness Cliffs SPA for summer 2013 are forthcoming, which will add greater certainty and robustness to the assessment and its conclusions.

RSPB Scotland **maintains its objection** to MORL's applications pending publication of the above mentioned items, which we expect to provide new important and contextual information within which we can reassess our current position.

Furthermore, we are also concerned with the following topics that we consider critical to our ability to make a full appraisal of the application.

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- **Collision Risk Modelling:** RSPB remain concerned over the suggested use of the extended version of the model (also known as Option 3).

- **Cumulative impacts:** We reserve judgement on the cumulative impacts of the proposal in combination with those of the proposed Beatrice wind farm, until such time as the key issues noted above have been concluded.

We provide, in the attached Annex, an account of our current understanding of all four issues and we propose next steps. Whilst we appreciate that the delays associated with waiting for these clarifications will be frustrating for the applicant, we feel that the relative brevity of the timescales, and the novel nature and scale of the development merits these more detailed considerations.

Aside from the resolution of these issues, it remains apparent that a number of seabird species will be significantly impacted by the proposed wind farms either in isolation or in combination with the Beatrice proposal, even under the 'most likely' scenarios and least precautionary assessment methods. It is also clear that there is the potential for adverse impacts on the integrity of Special Protection Areas in the region. There will, therefore, be a need for detailed consideration of further mitigation measures to avoid impacts to internationally important species and habitats.

RSPB Scotland recommends further dialogue with all stakeholders to seek resolution of the issues highlighted above and to initiate detailed discussions on appropriate methods of mitigation.

Yours sincerely,

[redacted]

Charles Nathan
Conservation Planner (Marine)

Cc'd Catarina Rei – Moray Offshore Renewables Ltd
Sophie Allen – Joint Nature Conservation Committee
Catriona Gall – Scottish Natural Heritage

Annex 1 - RSPB Scotland Response: MORL Applications (July 2013)

As referred to above there has been discussion and progression in the methods of assessment since the original application and RSPB's original response of November 2012. For the avoidance of doubt the following key topics represent our priority concerns in regard to MORL's applications, and they are a progression of comments made in our original response.

- **Displacement:** a Marine Scotland commissioned research package into the effects of displacement on seabirds is forthcoming. RSPB Scotland sits on the steering group of this project and will make use of the outputs when making our consideration of the project in isolation and cumulatively. We recommend Marine Scotland utilise this resource when preparing their recommendations to Scottish Ministers.

- **Colony counts:** results of an SNH-led colony count of East Caithness Cliffs (ECC) SPA for summer 2013 are forthcoming. Our original letter of November 2012 stated the need to factor recent population trend data into the assessment. Given the timing of the application and reporting of colony counts at ECC SPA, there is an opportunity to refine the impact assessment using up-to-date information for one of the key receptor sites and several species affected by the MORL and Beatrice proposals. We consider these new, up-to-date counts to be critical in any further assessment of offshore windfarm proposals in the Moray Firth, and that it is essential for them to be incorporated into any recommendations made to Scottish Ministers.

- **Collision Risk Modelling:** RSPB remain concerned over the use of the extended version of the model (also known as Option 3). This extended version attempts to incorporate empirical data into the model to increase confidence in the outputs and provide estimates that reflect more realistic seabird behaviour. However, the accuracy of the data on species flight heights and the degree of error and uncertainty in the calculations for this version remain unresolved. RSPB will continue to undertake our own review of this element of the model and we are aware that the Renewables Scientific Appraisal Group is also looking at this issue. Until such time as these issues are resolved, the conclusions made in MORL's assessment, based on Option 3, do not give us the certainty we require to inform our appraisal of the application.

    - **Avoidance rates:** MORL has used less precautionary avoidance rates in their assessment of collision risk than the 98% rate recommended in statutory guidance. As referred to in our original response, we do not believe there is currently a sufficiently robust case for changing the current 98% default collision avoidance rate. This is particularly true since there may be increased uncertainty in using Option 3 of the model, and avoidance rate is in part a correction factor for this uncertainty. Marine Scotland has commissioned a review of avoidance rates applied to CRM. This review is ongoing and there has been no change to the statutory guidance of using a 98% avoidance rate for all seabird species. RSPB Scotland support this guidance as it stands.

      To avoid the risk of development going ahead which harms seabirds, and by consequence the reputation of the offshore wind industry, it is critical that the current, and in our view suitably precautionary approach, is adopted.

- **Cumulative impacts:** We reserve judgement on the cumulative impacts of the proposal with that of the proposed Beatrice wind farm, until such time as the key issues noted above have been concluded.

  We intend to utilise and apply the findings of up-to-date research on cumulative impacts in making our appraisal of the Beatrice and MORL wind farm proposals, which affect the same features of conservation importance in the region.

RSPB Scotland

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7th January 2014

Dear Mr O'Sullivan,

Moray Offshore Renewables Limited and Beatrice Offshore Wind Limited applications for Marine Licenses & Section 36 Consent – RSPB Scotland consultation response

RSPB Scotland is a strong supporter of renewable energy. Renewables make an important contribution to reducing greenhouse gas emissions that are causing climate change and affecting wildlife in Scotland and around the world. However, developments must avoid harm to our most important wildlife and wildlife sites. To help ensure developments are of an appropriate scale and in suitable locations, RSPB Scotland has been involved in almost every major wind farm development in Scotland, including all the offshore wind proposals.

Four separate applications for Section 36 Consents and associated Marine Licences have been submitted by Moray Offshore Renewables Limited (MORL) and Beatrice Offshore Wind Limited (BOWL). MORL proposes three offshore wind farms including Telford, Stevenson and MacColl, each amounting to a maximum 500MW capacity and BOWL proposes a single 1000MW wind farm. The four contiguous sites are all located in the outer Moray Firth.

The applications in isolation and in combination were appraised by statutory authorities JNCC and SNH in July 2013, which concluded that there were potential adverse impacts on site integrity at the East Caithness Cliffs SPA. Since July, the statutory authorities and Marine Scotland (MS) in discussion with the applicants, have sought to address these matters affecting natural heritage. RSPB Scotland's recent discussions on the proposals with the applicants and with MS, JNCC and SNH have informed our final appraisal of MORL and BOWL's applications.

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RSPB Scotland **objects** to the MORL & BOWL applications for the following reasons:

- **the environmental impacts, in isolation and in-combination, of the proposed developments would be likely to adversely affect the integrity of the East Caithness Cliffs Special Protection Area (SPA).**
- **the environmental impacts, in isolation and in-combination, of the proposed developments would be likely to result in unacceptable harm to a range of seabird species, most notably great black-backed gull, herring gull, gannet, kittiwake and puffin. Furthermore, the national population trends of some of these species are deteriorating, which exacerbates these concerns.**
- **a high degree of precision in the process of assessment, interpretation and the setting of predicted impacts and thresholds has been applied. We consider this level of precision is unjustified, particularly given the inherent uncertainty of the assessment process that is compounded by a lack of understanding and empirical data on the biological and behavioural ecology of seabirds and seabird populations. As a result, the robustness of the conclusions of the assessments is questionable and this requires that adequate precaution is taken.**

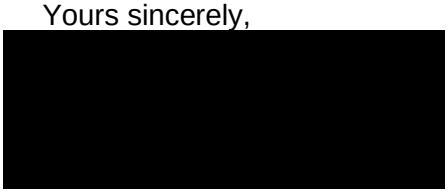
There is a likelihood of the developments, in isolation and in-combination, having a significant effect on the nearby East Caithness Cliffs SPA. The Scottish Ministers, as competent authority, must therefore carry out Appropriate Assessments under the Conservation (Natural Habitats & c.) Regulations 1994 (as amended) and the Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007 (as amended), before considering the possibility of granting consents. Whilst the applicants have provided a very great deal of supporting material to help inform the Appropriate Assessment, we do not consider that the information available, either in the Environmental Statements (ES) or in any subsequent reporting and advice provided by the statutory nature conservation bodies or Marine Scotland Science (MSS), would enable Scottish Ministers to conclude with the necessary degree of certainty that the developments, either in isolation or in-combination, would not adversely affect SPA site integrity.

In addition to the tests of the 1994 and 2007 Regulations, there are additional obligations on Scottish Ministers to conserve biodiversity set out in a variety of forms in, for example, the Electricity Act 1989, the Nature Conservation (Scotland) Act 2004 and the Marine (Scotland) Act 2010. Although Government policy is supportive of offshore wind (as set out in the Electricity Generation Policy Statement 2013 and in the 2013 consultation draft of the Sectoral Marine Plans for offshore wind, wave and tidal/ Blue Seas Green Energy (2011)), this is conditional on projects being of an appropriate scale where environmental and cumulative impacts can be satisfactorily addressed.

Having acknowledged our concerns the applicants have stated their willingness to develop a reduced overall capacity to that applied for, in an effort to reduce the likely impacts of their projects. We welcome this proposed reduction in overall capacity from 2,500MW to approximately 1900MW and, combined with changes to turbine size and number, recognise the consequent significant likely reduction in environmental risk. This reduction in impacts would make it more likely that the development could be consented in accordance with the requirements of the Habitats Regulations. However, given the wide range of uncertainties we consider that development with a capacity totalling around 1000MW would be more likely to be acceptable, although even at this much reduced scale we are unable to have complete confidence that this would not lead to adverse effects on site integrity.

Should the Scottish Ministers be minded to consent these applications, despite the significant adverse environmental impacts likely to result, we suggest (without prejudice to our objection) a number of measures that might help mitigate, compensate or offset some of the adverse impacts of the developments, provided they are secured as conditions of consents or other robust and enforceable mechanisms to ensure their delivery. Details of these and a fuller account of our reasons for objection can be found in the attached Annex.

Yours sincerely,



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Colin Palmer – SSE Renewables

ANNEX: DETAILED RSPB SCOTLAND COMMENTS – DECEMBER 2013

1.0 Environmental Assessment

1.1 Collision Risk Models (CRM)

Variants of a collision risk model are used to predict bird collisions with turbine blades at offshore wind farms. For the Moray Firth applications an extended version of the Band 2012 model has been used. However, the appropriateness of using this extended model and particularly the associated source data and avoidance rates, is still in question and the subject of wide debate and on-going work across the Statutory Nature Conservation Bodies (SNCBs) and offshore wind stakeholders. Concerns are largely focused on the applicability of a correction factor, "Avoidance Rate", to the output from this model. The theoretical derivation of this factor has been based entirely on the original, basic version of the model, and includes modeling error and uncertainty specific to that version. Therefore, as explicitly acknowledged by the model's author[1], the avoidance rate for the basic model should not be directly applied to the extended model, as has been done for the Moray Firth advice. There is a review contract on avoidance rates underway, via Marine Scotland Science, which will examine these issues and is due to report in March 2014. Consequently, decisions to adopt a less precautionary methodology at this stage may be unfounded. We note that both JNCC and Natural England support the use of the basic model with a 98% avoidance rate for all seabirds, at the present time. As there is no community consensus on the use of extended model at the 98% avoidance rate, it is unreasonable to base the determinations of the Moray Firth applications on these assessments alone.

The extended model relies on flight height distribution curves presented in Johnston *et al*, (2013). While we acknowledge that the mathematical procedures used to generate these curves are robust, we have concerns over the assumptions implicit in the models, and which are largely acknowledged in the paper. In particular, the model assumes that birds are correctly assigned to the correct height category. This assumption is not validated, and initial indications, e.g. from terrestrial trials and offshore post-construction monitoring, are that it may not be valid. Given that the CRM outputs can be strongly influenced by an upward shift of the rotor hub of a few metres, these inaccuracies in raw data may have important implications to the output of collision risk estimated. Also the input data are heavily biased toward boat survey and birds will alter their behavior, including flight height, in the presence of boats[2] (Camphuysen *et al.* 2004) often flying lower[3] (Furness *at al* 2013). Such behavioural change is implicit in the inclusion of a "boat bias" in the revised calculations carried

[1] Band, W. (2012) Using a Collision Risk Model to assess bird collision risks for offshore wind farms, Final report, March 2012*SOSS Report, The Crown Estate*

[2] Camphuysen, C. J., A. D. Fox, M. F. Leopold, and Ib Krag Petersen (2004). Towards standardised seabirds at sea census techniques in connection with environmental impact assessments for offshore wind farms in the UK A comparison of ship and aerial sampling methods for marine birds, and their applicability to offshore wind farm assessments. *Koninklijk Nederlands Instituut voor Onderzoek der Zee Report commissioned by COWRIE*

[3] Furness, R. W., Wade, H. M., & Masden, E. A. (2013). Assessing vulnerability of marine bird populations to offshore wind farms. *Journal of environmental management*, *119*, 56-66.

out by SNH, although this does not account for variations in flight height. As such the results may overestimate the proportion of bird flights under normal conditions that are below rotor-swept height.

The statutory advice and guidance on CRM[1] recommends the use and presentation of a range of avoidance rates and also the presentation of all three (or four) options. We would also expect a justification or discussion to be provided as to which of the options is most likely to characterise the collision risks at the site. An attempt should also be made to convey the uncertainty in the estimate, aiming to express this at around 95% confidence limits as set out in guidance. None of this guidance has been followed in the preparation of the SNCB and MSS advice for the MORL and BOWL projects, and there is no explanation of whether the SNCBs addressed the uncertainties and appropriateness surrounding the extended model at 98% that are noted in their original advice of the 8th July 2013.

Having stated our preferred approach, given the current circumstances, we want to acknowledge that the internal mathematics of the extended model are robust. However, there remains the need for clarity on the suitability of the flight height data and the need for defining their confidence limits **AND** for the issue of an appropriate avoidance rate to be defined. Therefore, scope exists for the extended model to be used, but with a more precautionary avoidance rate (i.e. 95%) to ensure adequate precaution is taken in the assessment.

Furthermore:

- Common currency uses short breeding seasons (May – Aug for gulls). This reduces the overall number of breeding birds input into the CRMs, thus minimising predicted impacts.

- The correction factors applied to herring and great black-backed gulls relating to boat attraction bias and apportioning to SPAs, which also reduce the input numbers into CRMs, while having some theoretical justification, lack numerical verification by empirical evidence. As such there is a high level of uncertainty around the correction factors, and this uncertainty is completely unacknowledged. Elaborating upon this point, recent studies indicate sexual segregation in foraging behaviour at sea by breeding adult gannets. There are observed consistent differences in their isotopic signatures indicating dietary segregation, including a likely higher proportion of fishery discards (thus boat following) in the diets of breeding males, which also foraged closer inshore than females[4]. If this similarly applies to gulls, there are different implications of accounting for boat following than an assumption of equivalent effect across all birds irrespective of sex (or age etc). No such sexual segregation was apparent during the non-breeding season, nor among non-breeding, immature (2-4yrs) gannets.

[4] Stauss, C., S. Bearhop, T. W. Bodey, S. Garthe, C. Gunn, W. J. Grecian, R. Inger, M. E. Knight, J. Newton, S. C. Patrick, R. A. Phillips, J. J. Waggitt, & S. C. Votier. 2012. Sex-specific foraging behavior in northern gannets Morus bassanus: incidence and implications. *Mar Ecol Prog Ser* 457: 151-162.

RSPB Scotland is fully engaged in the CRM discussions amongst the ornithological community and it is apparent that the use of 98% avoidance rate for the extended model is currently inappropriate and that a more suitable rate is likely to be nearer 95%.

These considerations indicate that the thresholds set by SNCBs and MSS (which are in any case not robust, as explained below) are exceeded for great black-backed gull.

Furthermore, the Band (2012) guidance recommends that an assessment should be made of whether site specific data are compatible with the generic data. A comparison of the Beatrice survey data with the generic data shows that the proportion of gannets and kittiwakes at risk height not only differs from the generic data, but lies outwith its 95% confidence limits. No explanation or account is given for this discrepancy.

RSPB's Conclusion on CRM: To conclude, there exists a significant level of uncertainty with the final 'common currency'-based CRM assessment, not adequately acknowledged by the SNCBs or MSS. The uncertainty lies within:

- The lack of consideration over the cross-applicability of 98% avoidance rate between the basic and extended models.
- The potential limitations and confidence of the generic species flight height data.

1.2 Displacement

The SNCBs acknowledged, in their advice of 8th July 2013, that understanding of the effects of displacement are limited. The advice suggested that this issue could be revisited following the MS commissioned research on displacement by CEH. However, this issue has not been addressed in the final advice of the SNCBs nor by MSS. This is despite the fact that the most recent drafts of the commissioned research suggest that there is potential for significant barrier effects, in particular, on seabird species, acting on breeding productivity, as well as both chick and adult survival rates. While we acknowledge that this research remains incomplete, these preliminary conclusions are pertinent to these developments, particularly given their scale and the level of environmental risk of causing significant displacement impacts.

Further to this uncertainty, there remains a lack of understanding of both the effects of displacement on puffins and their population status at the Caithness Cliffs (North and East) SPAs. Furness et al 2012[5] assessed displacement effects upon puffin as moderate, and while empirical data remain sparse this should be an indication of the need for precaution. While current information (cf July 2013 SNCB advice) suggests that the Caithness Cliffs population is in unfavourable status, this further reinforces the need for precaution. Counts carried out in 2013 should clarify this, though the results are not yet in the public sphere. It is remiss that this census information has not

[5] Furness, Robert W., Helen M. Wade, and Elizabeth A. Masden. "Assessing vulnerability of marine bird populations to offshore wind farms." *Journal of Environmental Management* 119 (2013): 56-66.

informed the decision making process. Therefore given this uncertainty, the potential of an additional adverse impact on an unfavourable population must be assessed more thoroughly in light of the scale of proposed development in the Moray Firth.

2.0 Interpretation & Advice

Both Acceptable Biological Change (ABC) and Potential Biological Removal (PBR) approaches are used within the recent SNCB and MSS advice for the Moray Firth Offshore Wind applications. **Our headline concern with the use of PBR and ABC is that neither tool is suitable for the purpose to which it has been applied here.** Their application in this instance appears to be an attempt to navigate around the requirements of the Habitats and Birds Directives and justify an additional likelihood of population decline.

Our concerns with the use of PBR and ABC can be summarised by the following points:

- **ABC** - No peer-reviewed scientific literature has been found on ABC. It originated in the USA as a management tool for recreational access to wilderness areas, and is only described in several "grey literature" reports. ABC uses probabilistic forecasts from population models, such as those produced by CEH, to address uncertainty. The Intergovernmental Panel on Climate Change (IPCC) produced an interpretation scale for probability scores which has been applied here to determine ABC, for example a probability greater than 0.667 is a scenario considered 'increasingly likely', but anything between 0.333 and 0.667 is classified "as likely as not" which represents a wide margin around the 50:50 equal likelihood. The IPCC scales were developed to help lay-interpretation of climate change models of often substantial uncertainty.

- As per MS's draft paper on PBR/ABC, "...*The risk of not meeting the conservation management objective would be considered significant if the likelihood changed beyond a level considered acceptable as defined by the ABC method*". Thus, in light of the IPCC probability scale, any change in the probability of a population decline "*up to 0.667 would be considered acceptable*". Furthermore, the paper indicates that "*the modelled population trajectory in the absence of the additional impact* (eg wind farm) *can be used to set the 'about as likely as not' management objective for the population"*. The approach then assumes no adverse effect if the combined effects of the projected change in baseline population together with the additive change attributable to the impact (wind farm) "*remain within the range of 0.333-0.667 of the mean value of the forecast unaffected population*". It is difficult to reconcile this with a population predicted to continue declining even without addition of the impact.

- We are particularly concerned by the content of MS's draft paper that has informed the SNCB and MSS advice for Moray Firth applications, which states: "*If an objective is set to maintain a population at a fixed size, when it is known to be*

declining, then the modelled probability of any decline below the fixed threshold can be expected to be at least likely. Consideration should be given to whether such a target is appropriate and achievable." This statement is of considerable concern to us. **If populations are declining in spite of objectives to maintain or stabilise them, action needs to be taken to identify and address the underlying causes. It is not acceptable to simply ignore these underlying problems when considering the acceptability of granting consent for projects which would put additional pressure on the populations.** We note that the recent judgement of the Court of Session in relation to the judicial review of the Scottish Ministers' decision to grant consent for the Viking wind farm on Shetland is highly relevant here, albeit that decision is currently subject to an appeal.

- There is a lack of clarity in the more detailed application of ABC, suffice to say that an increase in the probability of decline of 0.75 to 0.83, arising from offshore wind farms, is considered acceptable in anticipation of greater abundance in response to increasing environmental carrying capacity owing to reduced effects of climate change. We accept that the beneficial impacts of development toward reducing the causes of climate change could be a valid consideration. However, this anticipated greater species abundance as a result of reduced impacts of climate change does not appear to be founded upon any scientific evidence. This issue requires a far more comprehensive and robust consideration if it is to be material in decision making.

- **PBR** - In contrast to ABC, PBR has a peer-reviewed publication track record as a recognised management tool, albeit still open to misapplication. PBR appears increasingly in offshore wind energy environmental impact assessments in the UK, almost certainly because it has few data input requirements and is quick and simple to perform – not necessarily always positive attributes. In its original application, for setting marine mammal by-catch limits in the USA, PBR relies on monitoring feedback to permit recalculation of "harvesting" rates, as an iterative process. This at least offers the opportunity for modification of harvesting rates where these are found to be excessive; it is far from clear how this approach would translate to offshore wind farms, something recognised in the MSS paper.

- PBR is appropriate for identifying levels of take which almost certainly cannot be sustained by the population. It should not be used to propose levels of take which can be sustained. Validation of PBR has not been done yet for birds or mammals.

- Overall, the ABC and PBR tools are only of very limited usefulness . They seem to be employed as mechanisms for accepting additional likelihood of population decline without seeking to identify and address the underlying problems. Although this may be a useful step, it does not represent an acceptable end point for the decision-making process, particularly in view of Ministers' obligations under Article 6(2) of the Habitats Directive and Article 2 of the Birds Directive.

3.0 Comments on SNH/JNCC and MSS Advice to Moray Firth Applications

- SNH/JNCC advice dated 29th October 2013 - Clarity is sought on the second bullet point of the first page of the SNCB advice. The sentence suggests that predicted cumulative impacts can exceed acceptable limits, while at the same time not having an adverse effect on site integrity. No definition is provided in this advice or previous advice for what constitutes an 'acceptable limit'.

- Use of PBR is made to establish thresholds for species mortality. As set out in 3.0 above, we do not support the use of PBR as a management tool for seabird populations, in particular for species whose populations are in decline and for which any additional mortality may represent an unacceptable risk in the context of the level of precaution generally required for Natura features. Furthermore it is clear the level of uncertainty in the application of PBR thresholds is high.

- Thresholds of mortality provided in the SNCB advice in July 2013 have changed from the most recent October 2013 advice, and MSS suggest a further change (MSS advice dated 31st October 2013). For example, a mortality threshold for great black-backed gull has changed from the original 2 birds per annum, to 6 birds in the revised advice and MSS now propose this be changed to 10 birds. While these changes seem small, they alter significance of impact the developments would have. Moreover, insufficient scientific reasoning is provided in the advice to justify these changes, which serves to reinforce our main concern that the levels of uncertainty are so great that a consensus has not been achieved as to the suitability of the current approaches.

- Given our concerns regarding the use of the extended CRM at 98% avoidance rate, we advocate the use of a more precautionary yet widely accepted methodology: basic model (Option 1) at 98%, particularly when comparing outputs of the basic model against the established thresholds in the SNCB & MSS advice. The SNCB & MSS advice and appraisal should acknowledge the higher degree of uncertainty presented by the extended model at 98% and the need to consider wider contextual data in the form of a range of options and avoidance rates. We have applied this approach, carrying out separate calculations for breeding and non-breeding birds, in establishing our own position.

- We are concerned that the work undertaken since the SNCB advice of 8th July by the developers, SNCBs and MSS (including: establishment of common currency; re-assessment of collision risk using revised model parameters and CRM options; and any further developments in assessing the effects of displacement/ barrier effects) could be considered to comprise additional environmental information, and as such may require statutory public consultation under the EIA regulations (Electricity Works (EIA) (Scotland) Regulations 2000 and the EIA (Scotland) Regulations 1999 - both as amended). The lack of communication from Marine Scotland during this period was frustrating, particularly as we have been unable to keep abreast of advice and the changes in assessment methods and parameters to allow us to fully appraise the applications. We feel this is primarily a consequence of what in our view has proved to be an overly compressed process for assessing these novel and complex projects in a very sensitive natural environment.

- The SNCB July advice made reference to the initial outputs of the East Caithness Cliffs SPA plot counts for 2013. It is disappointing to note that these data have not yet been published, particularly given the context they could provide on the population trends for the species of concern.

- Adverse impacts are also predicted for other seabird species including Atlantic puffin (see section 1.2), Northern gannet and black-legged kittiwake. The predicted collision mortalities for gannet, using the basic Band model at 98% lie near the upper limit of the stated SNCB thresholds (July 2013 advice), with (Band 2012) Option 3 at 98% avoidance rate providing an estimate below the given threshold range. Given the uncertainty and lack of confidence in extended versions of the CRM and the range of predicted impacts, this example highlights the requirement to take a precautionary approach that would minimise environmental risk and avoid the risks of being associated with projects that could cause seabird mortality at significant scales.

Cumulative impacts

The annual collision mortalities predicted by the CRMs, both for basic and extended versions at a range of avoidance rates, give cause for concern for species including great black-backed gull and herring gull, but also for gannet and kittiwake. In particular, we are concerned that the scale of predicted mortalities, including wintering mortalities and their effects, or cumulative effects, do not appear to have been full considered. This applies particularly to species that are SPA qualifying features and those species already experiencing national declines in population. A precautionary approach should be applied in this case as supported by legislation.

There is a need to distinguish breeding season versus non-breeding/ winter season and the potential cumulative effects that occur across wider ranges and offshore wind farms in other UK waters. This is particularly relevant for gannet. Tracking studies of gannets at multiple breeding colonies around the UK in 2010-2011 indicate strong segregation of foraging areas with little if any overlap between areas used by adjacent colonies[6]. However, some tracks for Gannets from the Bass Rock do extend into the offshore wind sites in the Moray Firth. Whilst most foraging activity by Bass Rock gannets is within the Firth of Forth area, it does also extend into the Dogger Bank round 3 windfarm site. There is, therefore, the potential for cumulative effects arising for Bass Rock birds as a consequence of proposed Moray Firth, Firths of Forth & Tay, and Dogger Bank offshore wind farm proposals and assessment of potential cumulative impacts of all these offshore wind sites will certainly be required as part of the consideration of the Moray Firth proposals.

From October especially, there is considerable overlap of gannets from different breeding colonies – even birds from Alderney seem to turn up in the Moray Firth[7]. Post-breeding, dispersal of gannets from the Bass Rock (Forth Islands SPA), was recorded to the north and south, from gannets fitted with geolocation data loggers in 2002 and 2003[7]. Of 20 tracked birds that wintered south of the UK, eight travelled north from the Bass Rock, around the north of Scotland and south down the west coast of Britain and Ireland, whilst 12 headed south and through the English Channel[8] (Kubetzki et al 2009). A further geolocation study in 2008 resulted in seven of the 21 recovered loggers indicating this northward migration route and 14 took the southward route[9,9] (Garthe et al 2010, cited in WWT Consulting et al 2012) along the east coast of the UK. Just one of the 13 satellite tracked post-dispersal gannets from Bempton (Flamborough Head & Bempton Cliffs SPA) was recorded taking the northerly route via the north of Scotland before heading south via the west of Britain[10] (Langston & Teuten 2012). This diverse pattern of migration increases the potential for interaction with multiple wind farms.

On the northward migration in spring, results from the same Bass Rock studies[7,8,10], indicated that three of the 20 geolocators fitted in 2002 and 2003 returned via the English Channel and six via the west coast and around the north of Scotland[7], compared with five and 16 of the 21 geolocation loggers fitted in 2008[8,10], respectively.

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[6] Wakefield, E. D., Bodey, T. W., Bearhop, S., Blackburn, J., Colhoun, K., Davies, R., Dwyer, R. G., Green, J., Grémillet, D., Jackson, A. L., Jessopp, M. J., Kane, A., Langston, R. H. W., Lescroël, A., Murray, S., Le Nuz, M., Patrick, S. C., Péron, C., Soanes, L., Wanless, S., Votier, S. C., Hamer K. C. 2013. Space Partitioning Without Territoriality in Gannets. *Science* 341: 68-70.

[7] Fort, J., Pettex, E., Tremblay, Y., Lorentsen, S.-H., Garthe, S., Votier, S., Baptiste Pons, J., Siorat, F., Furness, R. W., Grecian, W. J., Bearhop, S., Montevecchi, W. A. & Grémillet, D. 2012. Meta-population evidence of oriented chain migration in northern gannets (*Morus bassanus). Frontiers in Ecology and the Environment* 10:237-242.

[8] Kubetzki, U., Garthe, S., Fifield, D., Mendel, B., & Furness, R. W. 2009. Individual migratory schedules and wintering areas of northern gannets. *Mar Ecol Prog Ser* 391: 257-265.

[9] Garthe, S., Kubetzki, U., Furness, R.W., Hüppop, O., Fifield, D., Montevecchi, W.A. & Votier, S.C. 2010. Zugstrategien und Winterökologie von Basstölpeln im Nord-Atlantik. Vogelwarte 48:367. Cited by WWT Consulting et al. 2012

[10] Langston, R. H. W. & Teuten, E. 2012. Foraging ranges of northern gannets *Morus bassanus* in relation to proposed offshore wind farms in the North Sea: 2011. RSPB report to DECC, DECC URN: 12D/315, London.

Arguably, potential impacts on migratory gannets may be of lesser concern than risk to breeding gannets because the birds are no longer constrained by central place foraging, and so generally more widely dispersed at lower density. There are also indications of a high degree of flight avoidance by migratory gannets around the Egmond aan Zee offshore wind farm[11]. However, this is a single, albeit well designed and executed, study at a small, inshore wind farm and may not present evidence that is more widely applicable geographically or to other stages of the annual cycle.

There is certainly theoretical potential for migratory gannet interaction with the Moray Firth proposal sites, albeit none of the records from these cited studies, at Bass Rock and Bempton[7,8,11] were from within the Moray Firth. However, these tracking studies were based on coarser resolution satellite and geolocation methods, compared with the more recent studies at Bass Rock, in 2010-2011, which used GPS data loggers and recorded some tracks within the Moray Firth[5]

With regard to Kittiwake, (Figure 1), there is a possibility that kittiwakes from Fair Isle, and perhaps mainland cliff colonies south of Moray, might use the area including the proposed offshore wind farm sites. Although none of our records coincide exactly with the windfarm sites, one Fair Isle record comes relatively close. These tracking data cannot be used to prove a negative, ie that birds do not use certain locations, but they do provide an indication of areas they definitely do use. It is therefore not possible to completely rule out potential effects on colonies other than the East Caithness Cliffs.

[11] Krijgsveld, K. L., Fijn, R. C., Japink, M., van Horssen, P. W., Heunks, C., Collier, M., Poot, M. J. M., Beuker, D. & Dirksen, S. 2011. Effect studies offshore wind farm Egmond aan Zee: Final report on fluxes, flight altitudes, and behaviour of flying birds. NoordzeeWind report nr WEZ_R_231_T1_20111114_flux&flight. Bureau Waardenburg report nr 10-219 to Nordzeewind, Culemborg, The Netherlands. Final report November 2011. http://www.noordzeewind.nl/wp-content/uploads/2012/03/OWEZ_R_231_T1_20111114_2_fluxflight.pdf, last accessed 25 June 2012.

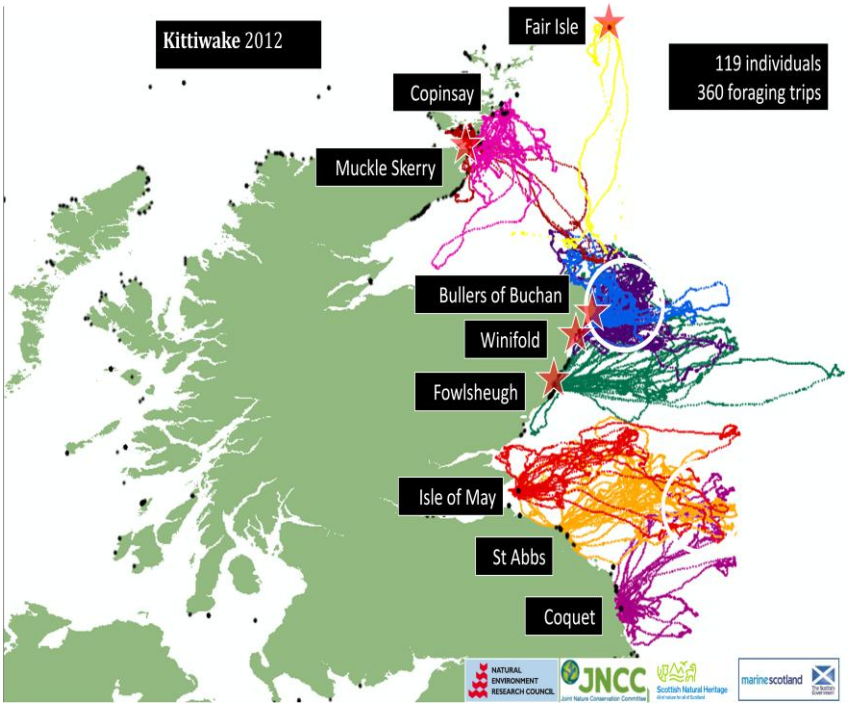

Figure 1. Kittiwake tracking data (RSPB confidential unpublished data)

5.0 Scottish Seabirds & Wider Measures to Achieve Favourable Conservation Status

Consideration of these offshore wind proposals takes place in a context where the populations of many of Scotland's seabird species are declining. The Scottish Government has a duty under the nature Directives (as transposed by regulation 3 of the 1994 regulations) to maintain favourable conservation status of their populations. The recent opinion of Lady Clark of Calton in the Petition of Sustainable Shetland for the Judicial Review of Scottish Ministers' consent for the construction and operation of the Viking Wind Farm on Shetland has highlighted the importance of taking a more holistic approach to the management of our environment. We believe this interpretation of the Directives and the Habitats Regulations is broadly correct and of particular relevance to the offshore environment and the current offshore wind proposals. One likely consequence of this interpretation is that, before granting consent for any of the currently propose offshore windfarms, Ministers will have to be able to demonstrate what action they have taken to try to ensure the conservation status of species reaches favourable condition, including how the requirement to identify marine protected areas has been progressed.

6.0 Mitigation

Despite our objection, RSPB Scotland is supportive of renewable development and we have aspirations for the delivery of a long term and sustainable offshore wind industry in Scotland. The scale of the current proposals and the lack of certainty in their potential environmental impacts present a significant challenge. However we do consider a reduced, but still significant, level of development could be accommodated within the Moray Firth. This level would enable progression of the industry and act as a test bed that delivers answers to various and important questions that remain with regard potential impacts to seabirds from offshore wind development.

We estimate that there may be potential for up to **1000MW** of development within the Moray Firth, using larger turbines **(6 - 7 MW or greater)**. With a reduced scale of development there will be further potential for mitigation through avoidance of areas that demonstrate more sensitivity within the site boundaries (i.e. areas supporting higher incidents of foraging, moulting or commuting birds or other factors). There is variation in habitat and bird presence across the sites including, for example, sandeel populations in the Smith Bank. Improved understanding and knowledge of this and other variations is likely to develop through pre-construction survey and monitoring and should be used to assist detailed site layout.

7.0 Suggested Conditions & Recommendations

If, despite RSPB Scotland's objection, Ministers are minded to consent these proposals or a part thereof, the following measures must be delivered through conditions of consent or other robust and enforceable mechanisms:

- In order to ensure that the results of monitoring can be used to not only assess the impacts of these developments on wildlife but also to inform the wider industry, all monitoring of new offshore windfarms should be overseen by a cross-community steering group (along similar lines to the terrestrial Scottish Windfarm Bird Steering Group). In our view this model offers the best prospect of delivering the necessary monitoring, research and publication that would inform future decision-making both in the Moray Firth and across the Scottish Offshore wind sector.

- Offshore wind will be exploiting the marine environment and causing additional adverse effects. A necessity exists for re-investment or a feed back loop back into the marine natural environment that ensures the protection and enhancement of the marine natural environment for the long term. A **marine natural environment/ ecological benefit fund** should be established to fund and coordinate this re-investment. Suggested measures include the pro-active and physical protection and enhancement of marine ecosystems, the feasibility of which should be explored. The details of the recent MacArthur Green paper[12] could be a first port of call for considering ideas that could be taken forward as suitable measures that could protect and enhance seabird populations and their associated ecosystems.

- Development should avoid the more environmentally sensitive areas within the application boundaries. Variation of site habitat and seabird density is described in Section 6.0 above and exists across the proposed sites. A condition requiring pre-construction survey and monitoring should be applied to assist in assessing the construction and operational effects of the windfarm but also to inform appropriate site layout.

- Lighting of structures must be undertaken in a manner that mitigates the potential impacts to species engaged in nocturnal flight, including passerines and other migratory species. Suitable lighting options should be explored, including that recommended by Poot et *al*. 2008[13].

[12] Furness, B., MacArthur, D., Trinder, M., MacArthur, K. 2013. Evidence review to support the identification of measures that could be used to compensate or mitigate offshore wind farm impacts on selected species of seabirds. Macarthur Green.

[13] Poot, H., B. J. Ens, H. de Vries, M. A. H. Donners, M. R. Wernand, and J. M. Marquenie. 2008. Green light for nocturnally migrating birds. *Ecology and Society* **13**(2): 47.