

APPENDIX C1

SAC MARINE MAMMAL INTERESTS SNH and JNCC ADVICE for HABITATS REGULATIONS APPRAISAL

Introduction

Any plan or project with the potential to affect the qualifying interests of a Natura site should be subject to Habitats Regulations Appraisal (HRA). The three wind farms currently proposed in the Forth & Tay – Neart na Gaoithe, Seagreen phase 1 and Inch Cape – each have the potential, individually and in combination, to affect the marine mammal interests of the following Special Areas of Conservation (SACs):

- **Moray Firth SAC** - designated for bottlenose dolphin (*Tursiops truncatus*).
- **Firth of Tay & Eden Estuary SAC** - designated for harbour seal (*Phoca vitulina*).
- **Isle of May SAC** - designated for grey seal (*Halichoerus grypus*).
- **Berwickshire & North Northumberland Coast SAC** - designated for grey seal.

Possible effects on these marine mammal interests will therefore need to be considered through HRA. For bottlenose dolphin, which is also a European Protected Species, please also refer to our advice on EPS licensing arrangements.

SNH & JNCC advice for Habitats Regulations Appraisal

In respect of the Forth & Tay offshore wind proposals: Neart na Gaoithe, Seagreen phase 1 and Inch Cape, we provide the following advice to Marine Scotland to inform the HRA for each of these proposals individually and in combination:

1. Are any of the Forth & Tay offshore wind development proposals connected with, or necessary for, SAC conservation management?

None of these proposals are directly connected with or necessary for conservation management of any of the SACs above.

2. Are any of the Forth & Tay offshore wind proposals likely to have a significant effect on the qualifying interests of the SACs either alone, or in combination with each other, or in combination with other plans or projects?

- **Bottlenose dolphins** of the Moray Firth SAC.

The dolphins range widely beyond the SAC along the east coast of Scotland. Modelling indicates that the noise emitted from pile-driving turbine and substation foundations could extend beyond the wind farm footprints and reach the coastal waters used by dolphins. It is unlikely that noise from other construction activity (which isn't predicted to extend beyond the wind farm sites), could give rise to significant disturbance of bottlenose dolphin. Nor is the noise emitted from operational turbines a significant concern¹. There may be impacts on the prey species of dolphin, either from placement of infrastructure or due to noise.

We therefore advise that **likely significant effects** arise from each of the Forth & Tay wind farm proposals, alone and in combination, on the bottlenose dolphins of the Moray Firth SAC.

As previously advised, the impacts of each of the Forth & Tay proposals need to be considered individually and in combination, and together with the two Moray Firth wind farm proposals: Beatrice and MORL Round 3.

¹ Marmo, B., Roberts, I., Buckingham, M.P., King, S., Booth, C. 2013. Modelling of noise effects of operational offshore Wind turbines including noise transmission through various foundation types. Edinburgh: Scottish Government. Available at: www.scotland.gov.uk/Resource/0043/00433718.pdf

- **Harbour seals** of the Firth of Tay & Eden Estuary SAC.

Harbour seals range beyond the SAC and may forage in, or transit through, the areas where the wind farms are proposed. Seals could be disturbed by pile-driving noise in particular, but boat movements, cable-laying, rock-dumping and other activities associated with wind farm construction may also affect them. The noise emitted from operational turbines is not a significant concern in respect of harbour seal (see footnote 1). There may be impacts on the prey species of seals, either from placement of infrastructure or due to noise.

We therefore advise that **likely significant effects** arise from each of the Forth & Tay wind farm proposals, alone and in combination, on the harbour seals of the Firth of Tay & Eden Estuary SAC.

- **Grey seals** of the Isle of May SAC and the Berwickshire & North Northumberland Coast SAC.

Grey seals range beyond these SACs and may forage in, or transit through, the areas where the wind farms are proposed. Seals could be disturbed by pile-driving noise in particular, but boat movements, cable-laying, rock-dumping and other activities associated with wind farm construction may also affect them. The noise emitted from operational turbines is not a significant concern in respect of grey seal (see footnote 1). There may be impacts on the prey species of seals, either from placement of infrastructure or due to noise.

We therefore advise that **likely significant effects** arise from each of the Forth & Tay wind farm proposals, alone and in combination, on the grey seals of these two SACs. Only the Fast Castle population of the Berwickshire & North Northumberland Coast SAC needs consideration; there is no connectivity between any of the Forth & Tay wind farms and the grey seals of the Farne Islands.

3. **Can it be ascertained that the Forth & Tay offshore wind proposals will not adversely affect SAC site integrity, either alone, or in combination with each other, or in combination with other plans or projects?**

This step is termed **appropriate assessment**, to be undertaken by Marine Scotland, based on available information and with advice from SNH & JNCC. It considers the implications of the proposed wind farms for the following **conservation objectives**² relating to marine mammals as an SAC qualifying interest:

To ensure that site integrity is maintained by:

- (i) Avoiding deterioration of the habitats of the qualifying species.
- (ii) Avoiding significant disturbance to the qualifying species.

To ensure for the qualifying species that the following are maintained in the long term:

- (iii) Population of the species as a viable component of the SAC.
- (iv) Distribution of the species within the SAC.
- (v) Distribution and extent of habitats supporting the species.
- (vi) Structure, function and supporting processes of habitats supporting the species.
- (vii) No significant disturbance of the species. (Repeat of (ii))

The key conservation objective to consider is to ensure the **long-term maintenance of marine mammal populations as viable components of the SACs**. This is because an assessment on this objective can take account of direct and indirect impacts to marine mammals when they range beyond the SACs.

We confirm that none of the other conservation objectives requires consideration at this time as most relate to maintenance of favourable conditions at each of the SACs.

We provide the following species-specific advice for HRA in respect of SAC marine mammals:

² Further information on SAC conservation objectives is available from: <http://www.snh.org.uk/snhi/>

- **Bottlenose dolphins** of the Moray Firth SAC.

During early discussions with Marine Scotland and the developers, we advised that for the purposes of HRA the east coast bottlenose dolphin population is synonymous with the SAC population. The current estimate is 195 animals, with 95% highest posterior density intervals (Bayesian equivalent to confidence intervals) ranging from 162 to 253 (Cheney et al 2013)³.

The Forth & Tay developers have each modelled potential impacts to bottlenose dolphin arising from pile-driving at the three proposed wind farm sites during construction. They have modelled a range of scenarios for these sites, individually and in combination. The model outputs – the zones of predicted impacts – are highly dependent on factors such as pile size, blow energy, location of piles and number of piles driven simultaneously. None of these parameters can currently be confirmed as submitted applications are based on use of a design envelope. For the ‘worst case’ scenarios, the predicted zones of noise disturbance / displacement could reach the coastal waters used by bottlenose dolphins. The temporary disturbance / displacement of individual animals has the potential to affect their energy budgets with potential consequences on their health and vital rates.

We welcome the population modelling for bottlenose dolphin undertaken by Inch Cape to explore the consequences of disturbance from the range of modelled piling scenarios for this site alone and together with Neart na Gaoithe and Seagreen (Inch Cape ES Appendix 14B). The results indicate that there should be no long-term population level effects on bottlenose dolphin from piling activity at these three proposed wind farms. (The overall construction period is assumed to be five years and the modelling is run for a period of 25 years, considered appropriate to the life-history of this species and equal to the proposed period of consent.)

Inch Cape also modelled an ‘extreme’ scenario which assumed a complete breeding failure of the bottlenose dolphin population in each year of construction (over a five year period). The outputs indicated that there could be population level effects over the long-term (the modelled period of 25 years).

In discussions with Marine Scotland Science (MSS), we concluded that the following aspects of this ‘extreme’ scenario can be considered unrealistic:

- (i) Complete breeding failure is extremely unlikely as it is unrealistic to assume that all females in the population will experience disturbance. Although the predicted zones of disturbance / displacement may seem large, they form only a small proportion of the overall population range of bottlenose dolphin along the east coast.
- (ii) A number of dolphin were predicted to suffer auditory injury (permanent threshold shift) so that a lowered survival rate was incorporated into the modelling. This is unrealistic and results from the application of SAFESIMM to dolphin densities that are over-estimated for offshore waters where they seldom occur.

Following discussion of these issues with MSS (meeting held 13 January 2014), a revised cumulative assessment was commissioned.⁴ As in the ES for MORL, Beatrice and Inch Cape, the revised assessment uses the population viability analysis model previously published in Thompson et al. (2000)⁵, with all necessary assumptions informed by expert opinion.

³ Cheney, B., Thompson, P.M., Ingram, S.N., Hammond, P.S., Stevick, P.T., Durban, J.W., Culloch, R.M., Elwen, S.H., Mandleberg, L., Janik, V.M., Quick, N.J., Islas-Villanueva, V., Robinson, K.P., Costa, M., Einfeld, S.M., Walters, A., Phillips, C., Weir, C.R., Evans, P.G.H., Anderwald, P., Reid, R.J., Reid, J.B., Wilson, B. (2013). Integrating multiple data sources to assess the distribution and abundance of bottlenose dolphins *Tursiops truncatus* in Scottish water. *Mammal Review*, 43, pp.71-88.

⁴ Thompson P.M. & Brookes K.L. January 2014. Cumulative bottlenose dolphin modelling for east coast of Scotland renewable developments (available from Marine Scotland Science).

⁵ Thompson, P.M., Wilson, B., Grellier, K., Hammond, P.S. (2000). Combining power analysis and population viability analysis to compare traditional and precautionary approaches to conservation of coastal cetaceans. *Conservation Biology*, 14(5), pp. 1253-1263.

The cumulative assessment focuses on the population consequences of dolphin disturbance resulting from the cumulative effects of wind farm piling in the Forth & Tay and the Moray Firth together – using the scenarios ‘Inch Cape Cumulative I’ in combination with ‘MORL Cumulative E’. The unrealistic predictions of PTS and assumption of complete breeding failure are removed from this modelling.

The results indicate that there could be short to medium term impacts on bottlenose dolphin during the estimated five years of construction, however, there should be no significant long-term effect on the population over the modelled period of 25 years. The predicted population outcomes for the impacted scenario (median of 193 individuals) are similar to those predicted for the baseline with no piling (median of 202). The effects shown are considerably smaller than those in the Inch Cape assessment and indicate that the long-term viability of the population is unlikely to be adversely affected by the Forth & Tay proposals in combination with Beatrice and MORL in the Moray Firth.

While the MSS modelling uses best available information, knowledge about bottlenose dolphin distribution and abundance on the east coast outwith the Moray Firth is still limited. SCANS II⁶ underestimates densities along the Scottish east coast because it doesn’t adequately cover the coastal zone where bottlenose dolphins spend most of their time.⁷ The Forth & Tay developers suggest some alternatives to derive spatially explicit densities for coastal waters in this area, but their accuracy is unknown.

The only available abundance estimate for the area estimated that between 81 and 142 dolphins were using the Tay estuary during the summer months of 2003 and 2004. This is a considerable proportion of the east coast population and indicates that this area is an important habitat for this population⁸. However, we do not know if, like for the Moray Firth, there are particular areas in the Forth & Tay region that are used more frequently, so that any estimate of the number of individuals exposed to disturbance is uncertain. MSS have established a network of acoustic monitoring devices down the east coast of Scotland, and combined with other research and monitoring, this initiative should help to address some of the current gaps in our knowledge of dolphin occurrence in this area.

Conclusion: SNH and JNCC advise that the construction and operation of these proposed offshore wind farms in the Forth & Tay, in combination with MORL and Beatrice in the Moray Firth, will not have an adverse impact on site integrity of the Moray Firth SAC, subject to conditions.

- **Harbour seals** of the Firth of Tay & Eden Estuary SAC.

During early discussions with Marine Scotland and developers, we advised that for the purposes of HRA the reference population for harbour seal should be the east coast management unit, which includes the population at the Firth of Tay & Eden Estuary SAC. This population is in severe decline, as modelled by SMRU (using data from 2011) on behalf of SNH and MSS. The counts from 2012 and 2013 indicate that the actual rate of decline may be faster than that predicted through the modelling. The population is in such decline that the current PBR set by Marine Scotland is only two.⁹ We do not yet understand the drivers of this decline and cannot identify or undertake any measures to reverse it.

⁶ Further information on SCANS – ‘Small Cetacean Abundance in the North Sea’ – available from: <http://biology.st-andrews.ac.uk/scans2/inner-background.html>

⁷ For further information on bottlenose dolphin distributions, please see Cheney et al 2013.

⁸ Quick N., Cheney B. 2011. Cetacean Baseline Characterisation for the Firth of Tay based on existing data: Bottlenose dolphins. Report to the Forth and Tay Offshore Wind Developers Group.

⁹ Further information on Potential Biological Removal (PBR) as used in seal licensing available from: <http://www.scotland.gov.uk/Topics/marine/Licensing/SealLicensing>

An impact assessment framework has been developed – initially for the Moray Firth wind farms and now in press for wider use¹⁰ – to consider underwater noise disturbance to harbour seals. This considers whether any noise (or other) impacts to individuals could result in population level effects through effects on animals' vital rates. The Forth & Tay developers have modelled the zones of predicted impacts in relation to noise injury and disturbance for harbour seal. This modelling is based on a spatial 'worst case' for pile-driving activity across the proposed wind farm sites. The zones of predicted impacts overlap with areas that seals may use.

The number of seals that could potentially suffer auditory injury (PTS onset) or that could be disturbed/displaced is calculated by overlaying the 'worst case' zones of each predicted impact with estimates of seal density derived from the Sea Mammal Research Unit (SMRU) 'at sea' usage maps. Each of the Forth & Tay developers has considered the population consequences of these impacts, with Inch Cape and Seagreen providing population models to help inform assessment (ES Appendix 14D and HRA Addendum Appendix 6, respectively). This work concluded that potential noise impacts to harbour seals arising from the Forth & Tay offshore wind farm proposals will make no material difference to the predicted decline of this species in the east coast management unit. Pile-driving, as modelled, is the noisiest and most disturbing activity during construction, and we confirm that other impacts such as indirect effects on prey, or disturbance to seals from boat movements, cable-laying or rock-dumping are unlikely to result in population-level effects.

The population modelling undertaken by Inch Cape (which included a cumulative assessment of each of the 3 Forth and Tay wind farms) used historic population data from 2008, because the current estimated number of animals in the management unit is now too low to use in the model. We agree this was the best available approach but it does raise enough doubts about the robustness of the outputs to warrant a precautionary approach. This is reinforced by the unfavourable status of the management unit population and we advise that measures should be taken to reduce the short and medium-term impacts from wind farm construction on harbour seal. We therefore require conditions on any consent to allow us to contribute to post-consent agreement of construction methods, programming and any required mitigation / monitoring to reduce noise disturbance and other impacts to harbour seal arising from the Forth & Tay wind farm proposals. Please see our supporting advice on conditions.

We also note that there may be a link between the use of vessels with ducted propellers and fatal injuries (corkscrew lacerations) to harbour seals recorded over the last couple of years¹¹. We advise that this issue could be addressed via a 'Vessel Management Plan', secured via condition, please see our supporting advice for further detail. Marine Scotland and SNH have commissioned research from SMRU on this issue. We will review the outcomes of this work and progress other research via the Special Committee on Seals (SCOS)¹² to try to understand the drivers for the continuing decline of harbour seal in the east coast management unit.

SNH is also involved in on-going discussions with Scottish Government and Marine Scotland over mitigation measures for harbour seal in respect of the NRIP proposals on the east coast.

Conclusion: SNH and JNCC advise that the construction and operation of these proposed offshore wind farms in the Forth & Tay will not have an adverse impact on site integrity of the Firth of Tay & Eden Estuary SAC, subject to conditions.

¹⁰ Paul M. Thompson P.M., Hastie G., Nedwell J., Barham R., Brookes K.L., Cordes L.S., Bailey H., McLean N. (2013). Framework for assessing impacts of pile-driving noise from offshore wind farm construction on a harbour seal population. *Environmental Impact Assessment Review*, 43, pp.73-85.

¹¹ Thompson, D., Bexton, S., Brownlow, A., Wood, D., Patterson, T., Pye, K., Lonergan, M. & Milne, R. (2010). Report on recent seal mortalities in UK waters caused by extensive lacerations. SMRU.

¹² Information on the role and remit of SCOS available from: <http://www.smru.st-andrews.ac.uk>

- **Grey seals** of the Isle of May SAC and the Berwickshire & North Northumberland Coast SAC.

During early discussions with Marine Scotland and developers, we advised that for the purposes of HRA the reference population for grey seals should be the east coast management unit, which includes the relevant populations in each of these SACs.

The Forth & Tay applicants have modelled the zones of predicted impacts in relation to noise injury and disturbance for grey seal. Depending on the wind farm / piling scenarios modelled, the zones of predicted impacts could overlap with areas that seals may use. However, these noise impacts to individuals, along with effects on prey species and/or disturbance to seals arising from other construction activities, will not significantly affect the grey seal population of the east coast management unit. The SAC populations and the population overall are robust and currently increasing and will not suffer any long-term impacts from wind farm construction.

The conditions we require in respect of bottlenose dolphin and harbour seal will also address potential noise disturbance and other construction impacts of these wind farm proposals on grey seal.

Conclusion: SNH and JNCC advise that the construction and operation of these proposed offshore wind farms in the Forth & Tay will not have an adverse impact on site integrity of the Isle of May or the Berwickshire & North Northumberland Coast SACs, either individually or in combination.

APPENDIX C2 JNCC & SNH ADVICE on EUROPEAN PROTECTED SPECIES

Background

The legislative framework for European Protected Species (EPS) is outlined in the joint JNCC and SNH scoping advice for each proposal (Neart na Gaoithe on 28 January and 31 August 2010; Seagreen on 8 September 2010 and Inch Cape on 29 October 2010).

EPS licensing guidance is currently under development for the marine environment in both Scottish and UK offshore waters. JNCC is the statutory nature conservation body which provides advice on EPS in respect of the Habitats Regulations for UK marine waters beyond individual country territorial limits (>12 nautical miles). SNH provides EPS advice in Scottish territorial waters (within 12nm).

The licence application tests¹³ for EPS in offshore waters (beyond 12nm) are as follows:

Any licence application (under regulation 53(1) of the Habitats Regulations(HR) and 49(6) of the Offshore Marine Regulations (OMR) will necessitate a detailed assessment of whether the licence should be granted. The licence assessment will be comprised of three tests to ascertain:

1. whether the activity fits one of the purposes specified in the Regulations;
2. whether there are no satisfactory alternatives to the activity proposed (that would not incur the risk of offence); and
3. that the licensing of the activity will not result in a negative impact on the species'/population's Favourable Conservation Status. The licence assessment will be carried out by the appropriate authority with the information provided by the developer and advice from nature conservation agencies.

Scottish Government Interim Guidance¹⁴ sets out the three tests that must be satisfied before the licensing authority can issue an EPS licence (within 12nm) under Regulation 44(2) of the Conservation (Natural Habitats &c.) Regulations 1994 (as amended):

Test 1 - The licence application must demonstrably relate to one of the purposes specified in Regulation 44(2) (as amended). For development proposals, the relevant purpose is likely to be Regulation 44(2)(e) for which Scottish Government is currently the licensing authority. This regulation states that licences may be granted by Scottish Government only for the purpose of "preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment."

Test 2 - Regulation 44(3)(a) states that a licence may not be granted unless Scottish Government is satisfied "that there is no satisfactory alternative".

Test 3 - Regulation 44(3)(b) states that a licence cannot be issued unless Scottish Government is satisfied that the action proposed "will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range" (Scottish Government will, however, seek the expert advice of SNH on this matter).

¹³ JNCC advice on EPS under the Offshore Marine Regulations 2007 (as amended) at: <http://www.jncc.gov.uk/page-4550> and <http://jncc.defra.gov.uk/default.aspx?page=5473>

¹⁴ SG Interim EPS Guidance available from: <http://www.scotland.gov.uk/Resource/Doc/158490/0042962.pdf>

JNCC & SNH advice on EPS licensing requirements

An EPS licence (or licences) will be required for each of the Forth and Tay wind farm proposals. As agreed with Marine Scotland, developers will submit their EPS licence application closer to the commencement of construction, once they have confirmed final wind farm layout, design and foundation options as well as construction schedules. We have requested a range of measures and information relevant to marine mammals that we advise should be included as conditions on any Section 36 / marine licence consents (please see our supporting advice on conditions in this regard). We recommend that this be used to support the required EPS licence application(s), including:

- Details of confirmed turbine locations and specification including foundation types, based on geotechnical survey information;
- Construction method statement(s) with detailed construction programming and a piling plan informed by;
- Updated noise modelling based on confirmed foundation type and installation parameters (such as blow energy and strike rate).
- Marine mammal mitigation and monitoring plan.

We welcome the developers' commitment to implementing the JNCC piling guidelines as mitigation and we will contribute to the development of an effective plan for mitigating and monitoring the effects of piling noise on marine mammals. We advise that the Expert Panel (see our supporting advice on conditions) undertakes a review of submitted EPS applications for any consented Forth & Tay wind farms. The Expert Panel should encourage a co-ordinated approach to mitigation and monitoring across these developments. We recommend that developers keep a watching brief on any further progress in relation to development and application of mitigation options.

JNCC & SNH advice on EPS Favourable Conservation Status

The statutory nature conservation advisers are responsible for providing advice on the 'third test' in each of the above regulations. For the species recorded frequently in the Firths of Forth & Tay (bottlenose dolphin, harbour porpoise, white beaked dolphin and minke whale) we refer to the JNCC species reports¹⁵ and EIA/HRA assessments provided by developers.

The temporary disturbance/displacement caused by the proposed wind farms has the potential to affect an animal's energy budgets with potential consequences to their health and vital rates. **Harbour porpoise, white beaked dolphin and minke whale** are wide-ranging species which occur throughout the North Sea and beyond. The spatial scale and temporary nature of the disturbance from wind farm piling and other construction activity is very small when compared to the range and movements of these species. **Therefore JNCC & SNH advise that disturbance will not be detrimental to maintenance of these populations at a favourable conservation status in their natural range.**

In respect of **bottlenose dolphin** we also refer to the population modelling commissioned by Marine Scotland.¹⁶ This models the population consequences of dolphin disturbance resulting from the cumulative effects of wind farm piling in the Forth & Tay and the Moray Firth together – using scenarios 'Inch Cape Cumulative I' in combination with 'MORL Cumulative E' (please refer to our HRA advice for further background and discussion). While the results indicate that there could be short to medium term impacts on bottlenose dolphin during the estimated 5 years of construction, there should be no significant long-term effect on the population over the modelled period of 25 years.

¹⁵ Third Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2007 to December 2012. JNCC (2013). Conservation status assessments for Species: S1351, Harbour porpoise (*Phocoena phocoena*), Species: S1349, Bottlenose dolphin (*Tursiops truncatus*), Species: S2032, White-beaked dolphin (*Lagenorhynchus albirostris*) and Species: S2618, Minke whale (*Balaenoptera acutorostrata*).

¹⁶ Thompson P.M. & Brookes K.L. January 2014. Cumulative bottlenose dolphin modelling for east coast of Scotland renewable developments (available from Marine Scotland Science).

JNCC & SNH therefore advise that disturbance of bottlenose dolphin as an EPS will not be detrimental to maintenance of the population at a favourable conservation status in its natural range, subject to conditions to mitigate wind farm construction impacts.

Please see our supporting advice on the conditions required.

For less frequently recorded cetaceans in the Forth & Tay, we confirm that disturbance arising to these species will not be detrimental to maintenance of these populations at a favourable conservation status in their natural range, for the same reason as stated above for harbour porpoise, minke whale and white beaked dolphin.

Further advice on an EPS Licensing Framework across UK Waters

The planned development of renewable energy in UK waters could involve multiple piling events occurring concurrently and sequentially, across a species range, over several years. This has the potential to have a detrimental impact on the Favourable Conservation Status of populations of marine mammal species occurring in UK waters. Continued strategic discussion is required between UK regulators (including Marine Scotland) and statutory nature conservation advisers (including JNCC & SNH) to develop a robust framework for cumulative impact assessment and EPS licensing across UK waters as a whole. Responsibility for this framework should lie with regulators in order to ensure a higher quality and consistency of assessment and improve efficiency.